THE EFFECT OF CORPORATE DIVESTMENT ON SHAREHOLDER WEALTH
THE UK EXPERIENCE

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DECLARATION

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ABSTRACT

This is the first known study of stockmarket reaction to U.K. sell-off announcements. Earlier U.S. studies have found positive market reaction to sell-off announcements. Various of these have aimed to relate the magnitude of market reaction to factors such as price declaration, completion of agreement and financial strength of divestor. This study also explores the impact of the above factors and their inter-relationships. Typical event-study methodology is used in estimating the size of the unexpected market reaction, the so called abnormal return.

Separate analysis of sub-samples is undertaken in this study to help enhance our understanding of market response to corporate sell-offs. Examples of such sub-samples are price/no-price groups and completion/intention groups. This analysis provides explanations for some of the seemingly contradictory U.S. study results.

A measure of financial distress, namely the z-score, is introduced to explore the "bankruptcy avoidance" hypothesis. We find a degree of financial distress prior to divestment to be inversely related to abnormal return - a result consistent with market approval for such "distress" sales. Relative size of divested part to parent is also shown to be positively related to abnormal returns. Price declaration seems to be vitally important in generating positive market response. Announcements of completed sell-offs along with the price is even more welcome by the market. Announcement of completed sell-offs with undisclosed price seems to induce market uncertainty and thus negative abnormal returns. Announcement of intended sell-offs with price disclosure as well as our overall sample results both provide statistically significant positive shareholder gains. This, latter finding is in harmony with U.S. studies.

To my family

Chapter 1 : INTRODUCTION

In the 1960's, US firms viewed mergers and acquisitions as a way of strengthening their market position. They believed that economic synergy could be derived from acquisitions. Such thinking resulted in the conglomeration of several entities that had to survive as a group under a central management. The running of such newly grown corporations introduced problems in every aspect of business, from finance and personnel, through to upgrading of manufacturing in the face of increasing technological advances made by the specialized competitors. International competition exerted pressure on firms to stay fit in their specific sectors. This pressure resulted in major reorganisation of corporations towards streamlining of their activities. In the 1970's, managers began to see that divestments could take place without any overall economic loss to the company, that is, by selling a unit whose continued presence is causing diseconomies or "negative synergy" in the selling firm (Linn and Rozeff, 1986, p436). Therefore, beginning a surge in divestment activities that is still on going.

Academic studies of divestiture in the finance literature have focused on the impact of the divestiture announcement on shareholder wealth as measured by the market. For example, an increase in the share price following the announcement of a sell-off, implies gains to shareholders. Such a sell-off action should in theory take place if the management expects a positive response from the stock market. The present study aims to see if this is the case and whether divestment strategies in the UK have led to increases in firm value.

Divestment is an important part of corporate restructuring and can take a number of forms which include:

a) Sell-offs where a division is sold to a new parent.

b) Spin-offs where a division is incorporated as a new and independent entity and is expected to survive on its own. The new ownership is initially kept within the same group of share-holders as the parent's.

c) Management buy-outs where the company is sold to the existing management.

Within the context of the shareholder wealth maximisation objective the financial impact of divestiture may be objectively measured by evaluating its impact on the share price. Spin-offs are very rare among UK firms and, therefore, not the subject of this study. Management buy-outs, although a regular method of divestment in the UK, are also not considered in this study. Market reactions observed on the announcement of management buy-outs is treated as a separate issue in the academic literature. This is due to the difference in the internal and external circumstances of management buy-out and sell-off deals.

Table 1.1 provides data on UK divestments since 1980 and shows the fairly steady increase over the years in the number of sell-offs and in the average sizes of sell-offs, at least until 1989.

Research in the United States demonstrates gains to shareholders around the announcement of sell-offs. It also shows that the magnitude of gain has some relationship to the relative size of the divested part compared with the parent (Zaima and Hearth, 1985; Klein, 1986). Price declaration is also shown to be an important factor in producing positive abnormal returns (Klein, 1986). The certainty of the divestment deal being completed is also studied (eg. Hearth & Zaima, 1986) but no clear conslusions have been drawn. Financial strength of the seller as measured by Standard and Poor's common stock ranking is found to produce higher gains to shareholders (Zaima and Hearth, 1985).

TABLE 1.1- Aquisitions, Divestments and Buy-Outs in U.K.

	INDEPENDENT ACQUISITIONS			SELL-OFF OF SUBSIDIARIES			MANAGEMENT BUY-OUTS		
YEAR	NO. ACQUIRED	VALUE £M	AVE. £M	No.	VALUE £M	AVE. £M	NO.	VALUE £M	AVE. £M
1980	368	1,265	3.44	101	210	2.08	107	50	0.47
1981	327	882	2.70	125	262	2.10	124	114	0.92
1982	296	1,373	4.64	164	804	4.90	238	348	1.46
1983	302	1,783	5.80	142	436	3.07	235	365	1.55
1984	398	4,252	10.74	170	1,121	6.59	238	404	1.61
1985	340	6,281	18.53	134	793	5.92	262	1,141	4.35
1986	621	12,279	19.8	221	3,089	14.0	313	1,188	3.79
1987	1187	11,861	10.0	340	4,668	13.7	344	3,214	9.3
1988	1123	17,300	13.1	376	5,534	14.7	371	3,715	10.0
1989	725	21,026	29.0	352	5,340	15.2	359	3,877	10.8
1990 to June	2322	3,068	9.5	183	1,661	9.0	214	1,419	6.6

Source: Business Monitor MQ7 and Center for Management Buy-Out Research of the University of Nottingham (Wright, Chiplin, Thompson and Robbie, 1992).

This research aims to examine the relationship between sell-off announcements and security returns in the United Kingdom. It is the first known study that involves the analysis of UK daily share prices in the divestment context. This study generally confirms the findings of US studies in that there are gains to the shareholders following

the announcement of sell- offs. However, in addition to replicating the findings of the US studies for the UK stockmarket environment, it also makes the following original contributions to the field:

a) The impact of certainty of completion of the proposed sell-off is tested directly and in isolation by examining a sample of announcements of completed sell-offs.

b) The impact of the initial announcement of divestment on shareholder wealth is measured in isolation from the deals that have been completed and then announced. Our results for this intention category show small and insignificant abnormal returns. Alexander, Benson and Kampmeyer (1984) found similar results and the discrepancy in their findings compared with other US studies, up to now, has not been fully explained. Our results for this subcategory are almost identical to those of Alexander et al (1984), and our consequent ability to provide an explanation for their contradictory results is another original contribution in this field.

c) The z-score, as a measure of company financial strength, is used for the first time in the study of divestitures and the relationship between level of financial distress of the divestor and stockmarket reaction to sell-off announcements is explored.

d) Several regressions of abnormal returns, as dependent variables, are conducted against independent variables such as price declaration, completion and intention of announcement, relative size of divestment to parent, and z-score.

e) On the methodological front, various tests using alternative measures of systematic risk and alternative assumptions of both dependence and independence in residuals are carried out and different return generating processes are modeled. Our empirical conclusions, relating to daily data, are also important for other researchers attempting to use daily data for event studies in the UK.

The general methodology adopted in this study is similar to that used in the US sell-off studies, that is, the risk adjusted excess returns surrounding the divestment announcement event are used in assessing the significance of the announcement impact. The methodology is based on Brown and Warner (1980, 1985). The relevant model parameters are adjusted for thin trading by adopting both the Dimson (1979) and Scholes and Williams (1977) methods and the results compared.

This study builds on and develops further in a UK context the extant US-based research. As with extant US studies, it focuses on the impact of sell-off announcement on shareholder wealth on or around announcement day. It does not explore managerial motivation-related issues (eg Tehranian et al, 1987; Denning, 1988). This thesis concentrates on sell-offs from 1985 through 1986, and the layout of this thesis is as follows:

Chapter 2: describes the causes and different forms of divestiture.

Chapter 3: provides a review of the relevant literature and identifies key research issues.

Chapter 4: discusses the main methodology used in the study, alternative methodologies and the data.

Chapter 5: reports the initial empirical results.

Chapter 6: describes the effects of applying different methodologies on the results.

Chapter 7: provides the results of regressions of abnormal returns on z-score, relative divestment size and price declaration for various sub-samples of data as well as on Intention and Completion dummy variables.

Chapter 8: summarises the results, draws conclusions and suggests directions for future research.

Chapter 2 CAUSES AND FORMS OF DIVESTITURE

2.1 CAUSES OF DIVESTITURE

The reasons for divestment are not the same for every company. The different forms of divestiture, namely, sell-off, management buy-out and spin-off, are each solutions specific to certain problems experienced by the divestor. Such problems are explored by Coyne and Wright (1986, pp. 1-26). Problem areas that induce a divestment can be grouped as follows:

1) Managerial Problems

2) The Need for Cash

3) Strategic Change

These categories are very broad and issues within them are inter- related. We aim to explain the issues within each of these groups separately. Divestment of a specific form is decided on with reference to the above categories of problems as part of corporate restructuring. Restructuring refers to liquidating projects in some areas and redirecting resources to other existing or new areas. The concept of restructuring has also been applied to changing the ownership structures or financing patterns in a firm. Divestment can be used as a means of corporate restructuring.

In traditional finance theory, managers are assumed to act in the interests of shareholders when divesting an asset or making a new investment. Management may be viewed as being involved in continual research process for the configuration of activities which produce the best returns for shareholders (Cable, 1977). Investment or divestment value is measured by discounting the expected cash flows

arising on such a decision. Shareholder wealth is similarly measured via the discounted value of the after tax cash flows paid out by the firm, namely, dividends plus capital gains. Corporate restructuring with a view to maximisation of shareholder wealth forms the theoretical foundations of our analysis of causes of divestments.

Furthermore, as mergers and acquisitions are also part of corporate restructuring, the theories developed in the field of mergers and acquisitions are of assistance to us in understanding the reasons for divestment. One such theory is the life-cycle theory. Life-cycle theory has been applied to products as well as industries. It consists of four stages: development stage, growth stage, maturity stage and decline stage. At the development stage of a new product or industry, an introduction period may be required. Such introductions may be associated with losses to the innovating producers. Growth stage is when consumer acceptance has been achieved and sales are growing. This stage is associated with high profitability and additional capacity is attracted into the industry. Maturity stage is when growth rate of sales slows down. The additions to capacity, stimulated by the record of high profits, may reach their peak as the growth of sales begins to slow. Excess capacity in the industry may develop and prices and profits decline. At the decline stage new products substitute at least in part for existing products. As substitute products are successfully introduced, they begin to erode the sales of the older product lines and growth rates for the older firms decline.

A generalised industry life-cycle is used to describe how different stages in an industry's development may lend themselves to different types of merger activities. At the introductory and growth stages, new small firms with investment opportunities but no cash to exploit them may sell out to larger firms from mature

industries where cash flows exceed investment opportunities. As products reach maturity stage, growth slows down and competitive pressures increase as excess capacity develops. This period is more likely to produce horizontal mergers in an effort to keep costs down via economies of scale (Weston et al, 1990, p.104).

The role of the industry life-cycle in relation to mergers and acquisitions is in much dispute. Wright and Thompson (1986) test for vertical disintegration and find no support for the view that such divestment is typical of growing markets. Harrigan (1979) has shown the importance of divesting product areas in the declining phase of their life-cycle. Duhaime and Grant (1984) find that life-cycle of the product and the firm may be influential in determining divestment. The general economic cycle, however, is not usually found to be a determinant of divestment. The UK experience shows, on the other hand, that in the case of a deep recession, as in the early 1980s, divestments may rise steeply (Coyne and Wright, 1982). Lack of finance may cause parents to sell-off those subsidiaries which are a great drain on resources, or in some severe cases, those which provide the easiest means of raising funds quickly (Coyne and Wright, 1986, p.13).

Schendel and Patton (1976, p.240) note that unexpected poor performance and deepening stagnation pressurise firms to take major decisions such as divestments. Pashley and Philippatos (1990) found different patterns of divestiture related to the life-cycle of divesting firms. Firms ending their expansionary phase and those entering maturity stage divested to reduce debt burdens incurred during expansionary phases. On the other hand, firms reaching their peak of maturity and those beginning their decline used divestment primarily to improve profitability by selling off poorly performing units. The firms in their declining stage were found to use divestment to improve their liquidity.

2.1.1 MANAGERIAL PROBLEMS

Maximisation of shareholder wealth by managers on behalf of shareholders requires effective control and monitoring of management as well as long term managerial compensation schemes. The related problem of pursuit of managerial self-interest to the detriment of shareholders is referred to as the agency problem. Jensen and Meckling (1976) were amongst the first to write extensively about agency problems of the firm.

Agency problems arise basically because contracts between managers (decision and control agents) and owners (risk bearers and principals) cannot be costlessly written and enforced. Resulting (agency) costs include (1) costs of restructuring a set of contracts, (2) costs of monitoring and controlling the behaviour of agents by principals, (3) costs of bonding to guarantee that agents will make optimal decisions or principals will be compensated for the consequences of non-optimal decisions, and (4) the residual loss, that is, the welfare loss experienced by the principals arising from the divergence between agents' decisions, in their own self-interest, and their obligation to maximise the principal's welfare. This residual loss can arise because the costs of full enforcement of contracts exceed the benefits.

Despite potential agency problems many organisations are characterized by separation of ownership and control, where decision agents do not bear the major wealth impact of their decisions. This separation of risk-bearing and decision functions is found in large professional partnerships, financial mutuals, non-profit organisations and open corporations. Open corporations is a term used by Fama and Jensen (1983) for large corporations whose residual claims (equity) are least restricted. Following characteristics are identified: (1) They

have property rights in the net cash flows for an indefinite horizon; (2) Stockholders are not required to hold any other role in the organisation; (3) Equity is alienable (transferrable, saleable) without restriction.

Fama (1980) and Fama and Jensen (1983) hypothesize that organizations in which ownership and control are separated survive because they have found an effective means of dealing with resulting agency problems. They argue that agency problems are controlled by separating decision management and decision control in complex organisations.

It is generally recognized that the decision process involves at least the following elements:

1. Initiation of proposals for resource allocation and structuring contracts.
2. Selection among alternative decision choices.
3. Implementation of ratified decisions.
4. Monitoring - measurement of the performance of decision agents.
5. Incentive and reward system.

Fama and Jensen (1983) hypothesize that the separation of residual risk bearing from decision management leads to the separation of decision control (selection, monitoring, and reward systems) from decision management (initiation and implementation). Their view is that the separation is efficient in complex organizations. Because the knowledge needed for decisions is diffused among many agents, (i.e. different levels of managers) decision management is delegated to agents who possess the relevant information - the hired professional

managers in the firm. Decision control rests with residual claimants (shareholders). The advantages to having residual claims in widely diffused ownership are twofold. First, the large risk of uncertain net cash flows is shared by many. Second, this enables corporate enterprises to raise substantial funds for buying assets and for bonding payments to creditors.

The common features of decision control systems involve (l) a decision hierarchy, (2) a mutual monitoring system among employees and managers, and (3) top-level decision control which usually resides in the board of directors. The ultimate source of internal control is the expert board of directors.

Fama and Jensen (1983) observe that open corporations are characterised by the most complete separation of decision management and residual risk bearing. This specialisation enhances adaptability to environmental changes. They point to a number of mechanisms which exist to control agency problems that may arise. Two of these mechanisms are external. One is the stock market by which prices signal a wide perception of the effectiveness of internal decisions. The other external mechanism is the takeover market by which outsiders can oust incumbent managers by direct appeals to residual claimants.

Control of the agency problem through the market mechanism has been the subject of a number of studies. Manne (1965) argues in his seminal paper that the alleged separation of ownership and control is considerably weakened by the existence of the market for corporate control. This market conveys to small shareholders both power and protection commensurate with their interest in corporate affairs.

The market for corporate control requires and presumes a high positive correlation between corporate managerial efficiency and stock price. The stock price of a poorly managed company declines relative to its industry or the market as a whole. A lower stock price facilitates takeover by giving the prospect of a large capital gain to those who believe that they can manage the company more efficiently. Thus, the takeover market provides some assurance of competitive efficiency among corporate managers and thereby affords strong protection to small, noncontrolling shareholders.

When organisational and market mechanisms are not sufficient to control agency problems, the market for takeovers provides an external control device of last resort (Manne, 1965). Mueller's (1969) managerialism theory argues that an agency problem is not solved through merger activity and that, on the contrary, merger activity is a manifestation of the agency problem. That is, managers are motivated to increase the size of their firm. He assumed that management compensation is a function of the size of the firm, and argued that managers adopt too low an investment hurdle rate. But in a study critical of earlier evidence, Lewellen and Hunstman (1970), presented findings that managers' compensation is significantly correlated with the firm's profit rate, not its level of sales. The basic premise of managerialism theory, therefore, is doubtful.

Mueller (1972) and Marris and Mueller (1980) have argued that managerially controlled firms where managers are rewarded on relatively fixed salaries according to their position within a large hierarchy, may not divest as readily as those which are owner-controlled, where emphasis is on maximising shareholder wealth. However, even under a managerialist regime, divestment

may provide a basis for subsequent growth and senior management may wish to trade-off the benefits of empire building against the problems of controlling large organisations.

Divestments can be seen as a way of enhancing managerial performance by separating differing managerial units or by providing some managers with an ownership interest in the firm. Wright and Thompson (1987) and Wright and Coyne (1985) explain how selling-off divisions may ease control within the firm without adversely affecting the units of the firm that remain. The ownership interest can more effectively motivate managers if it relates to the division or divisions that are under their control. The management interest in a large and well established conglomerate where managers each have only a minor influence is not so effective, in motivating managers, as an interest in a smaller divested unit or in the remaining parts that they can influence and control.

There are several areas that generate managerial problems to the extent that divestment might be viewed as a way out:

1) Behaviour of the managers of a subsidiary may not be compatible with the objectives of the organisation as a whole and hence may be detrimental to its overall performance.
2) The organisation may become so diverse and large that the central office is unable to prevent divisional management opportunism occurring in the divisions (Klein, 1983; Wright, 1986). Opportunism involves self-interest seeking with guile and includes shirking, cheating and other suboptimal behaviour. It can involve data distortion or making of self-disbelieved promises (Weston, Chung and Hoag, 1990, p 29).

3) A rapidly changing environment may hinder the subsidiary management's ability to adapt to changed circumstances and hence poor performance results through control loss (Wright et al, 1983).

4) New opportunities may be lost due to the lack of incentive for the management to take advantage of such opportunities. To revive a spirit of entrepreneurship may necessitate spinning off of the division concerned so that management may be rewarded more directly within the new smaller spun-off unit.

5) There might be incentives for some managers to leave the organisation and set up in direct competition to the parent. Alternatively, managers may engage in opportunistic behaviour which cannot be resolved internally by improved incentives. The parent in such cases may decide to encourage a management buy-out while protecting the required relationship between the ex-subsidiary and parent.

Following a divestment there would be the need for a change in the composition and responsibility of the management team, and incentive structure.

Another area of management literature that is of relevance to organisational problems and divestment decision is transaction cost efficiency. A transaction represents the transfer of a good or service across a technologically separable interface (Williamson, 1971, 1973). The purchase rather than production of a car component by an automobile manufacturer would be an example of such a transaction. The transaction at arm's length may be smooth, or the parties to the transaction may disagree on the quality of the goods or service and haggle over the terms of exchange. A smooth exchange could be achieved by an organisational arrangement between the transactors to provide for each other's needs within the same organisation.

There are circumstances where the firm might decide not to obtain a product or service from the outside but rather produce the same internally, (Williamson, 1971). Williamson (1971, 1975) argues that a set of environmental factors together with a related set of human factors cause such contracts to be costly to write, execute and enforce. He attempts to identify these sources of friction which ultimately lead transactions to be executed within a firm rather than across a market. He holds that the benefits derived from internalisation of a transaction are from informational efficiency, particularly where strategic and operational responsibilities are separated within a multi-divisional (M-form) structure. This structure is claimed to permit the use of decentralised information whilst, at the same time, minimising the potential for shirking, opportunism, etc. The transaction cost model underlines the suitability of internalisation of transactions in areas where frequent applications of proprietary knowledge are made; where assets are indivisible (Teece, 1980) and where there is lack of trust in complex transactions (Butler and Carney, 1983). However, the cost of coordinating or managing transactions within the organisation may offset the benefits of a smooth, internally organised transaction. Under these circumstances the parent might decide to divest, in the form of sell-off, or spin-off or management buy-out, and purchase the required product or service from the divested part.

2.1.2 NEED FOR CASH

By the term "need for cash" we refer to the urgent need for funds to finance the business as a going concern or to boost performance of some divisions in an attempt to avoid further deterioration of the firm's financial position and ultimate bankruptcy. Such needs for funds are distinguished from general requirements for investment funds by their urgency. The requirements for long term

investment funds are dealt with in Section 2.1.3 on Strategic Change below, where the parent is considering the reshaping of the investment portfolio of the group and the requirements for further investments.

The need for cash may be observed at the level of the subsidiary or the parent. At the subsidiary level there may be demand for a large cash injection to implement a project with recognised potential. The parent may be either unable to raise, internally or externally, the required capital and thus lose the opportunity for growth in that subsidiary. Two options may then be open to the parent: First, the sale of the whole subsidiary and preferably, at a premium, to a buyer who can exploit the potential of the subsidiary best. Secondly, the parent may have the option to divest a different unit to raise sufficient cash for injecting into the subsidiary with growth potential. In both cases the divestment route is taken.

In cases of severe financial distress, divestment may be the only route to avoiding bankruptcy. Divestment may be used as means of raising cash and reducing the debt burden of the group. Such a divestment may follow high leverage buy-outs or high leveraged acquisitions. For example, in the case of the Iscoceles bid for the Gateway supermarket chain, an agreement was made prior to the bid whereby Asda would purchase a certain number of Gateway stores. The proceeds from the sales were used to reduce the high levels of debt following this acquisition. An extreme case of such an exercise is total liquidation, as an alternative to bankruptcy. This would constitute selling assets of the firm piecemeal to various interested parties rather than selling the whole of the firm to one buyer. There is also a case for partial or total liquidation when management believes that the existing management structure is no longer viable and that not only do the assets have a higher-valued use elsewhere, but they are also more

valuable divided and sold off in piecemeal fashion, (Hite and Owers, 1986, p. 422). Liquidation is proposed in such a situation as a way of unlocking such shareholder wealth. The current organisation in this situation is dismantled and each unit or division is sold as a going concern. Hite, Owers, and Rogers (1987) find highly significant risk adjusted returns to shareholders over the announcement period of liquidation (12.2% average).

The need for cash, although often stated as a reason for divestment, seems to be only one of the reasons for divestment as it can be a very expensive way of raising funds compared with borrowing or issuing equity (Linn and Rozeff, 1986, p.430). The real cause may simply be opportunistic in that the seller feels it can obtain a good price for the subsidiary. The fact that the newly liquid assets are used to pay off debt may be a secondary matter and not the sole purpose of divestment.

2.1.3 STRATEGIC CHANGE

Strategic planning as defined by Argenti (1974, p.15) is careful, deliberate, systematic taking of decisions which affect, or are intended to affect, the organisation as a whole over long periods of time. Ansoff (1969, Ch.1) suggests that strategic decisions are those that arise from the external influences on the company (ie from its environment) as opposed to tactical decisions which arise from internal problems. In this study we define strategic change as change in those strategies that determine financial structure, product and market structure and organisation structure. Such decisions are a response to environmental pressures and changes. One of the causes of such pressures could be the industry life-cycle as explained earlier. Another major influence on the number of

divestments is the level of mergers and acquisitions. Divestment waves are found to follow merger waves within one to two years (Linn and Rozeff, 1986 p.435).

The parent firm's management may lack the expertise to manage dissimilar assets. The assets may be creating negative synergy, actively interfering with other profitable operations of the parent. The process of strategic divestitures enables selling firms to salvage a portion of their investment by selling assets to other firms who could exploite them more profitably. Such divestments may also be planned prior to an acquisition if they are seen to be a poor fit to the acquiring firm. In cases of acquisitions of undervalued investments or firms with underperforming management, the acquiror may, after increasing the value of a segment acquired, sell-off that segment at a profit.

Some divestitures can be made to correct previous investment decisions (Weston et al, 1990, p.226). Mistakes may occur in connection with internal or external investments. Such mistakes are likely to occur when companies engage in efforts to diversify. This is because they are moving into product-market areas with which they have less familiarity than with their existing activities. Some divestments represent the harvesting of earlier successful investments. Here the purpose may be to make financial and mangerial resources available for developing other profitable opportunities.

Re-structuring of an organisation in an ever changing environment is of paramount importance. Corporate restructuring in times of crisis might well result in divestments (Wright, 1985, p.9). Crisis could be manifested in such areas as:

a) Finance, that is, severe liquidity problems.

b) Labour contract, when there are insufficient incentives, inability to monitor the labour force, divisional employees requiring parity with workers in other divisions, and when there is an inability on the part of the parent to change pay and incentives structures.

c) Product markets, when there is a long term decline in the firm's markets and affinities between different parts of the corporation may break down.

d) Organisation failure (Jensen and Meckling, 1976), where the functions of the firm cannot be held together, monitored and managed effectively within the existing organisation.

In each of the above cases the goal of the management is expected to be the rescue of the group from the crisis and to maximise market value. Divestment, as a means of corporate restructuring and regaining confidence within the group may then be offered to the board in one or more of its various forms, spin-offs, management buy-outs and sell-offs.

If the announced divestment is perceived by the market as good news, share prices should increase and shareholders gain. An example of the usefulness of divestiture as an effective tool in corporate restructuring is in the case of US divestor Dillingham in 1978 (Hite and Owers, 1986, p419), where managers orchestrated a remarkable series of structural changes and earned risk-adjusted returns of 185% for their stockholders. Of this gain more than 160% preceded the announcement of the leveraged buy-out proposals which included sell-offs, piecemeal liquidation of assets, spin-offs and management buy-out.

The management of Dillingham started the restructuring following a take-over threat which was initially perceived as a crisis. However, the restructuring which was accomplished over a period of four years, was conducted in a positive spirit of profit maximisation rather than rescue from disaster. Whereas there are divestments that take place as a response to crisis, there are also divestments by parents that take place in the absence of any crisis - where the management can sell a unit at a price they can justify as a good deal. The market should react positively to such deals and is apparently attracted to a sell-off announcement when it can see that the parent is likely to remove certain diseconomies and is shaped for making higher profits.

The sell-off of a subsidiary, division, or line of business, could be viewed as a mechanism for transferring assets to higher valued users in other corporations. The buyer of a divested entity may have comparative advantage in monitoring and controlling the management of the subsidiary or may offer economies of scale. Such gains from economic synergies are transferred to the seller in part as a premium and thus one would expect to observe positive market response on announcement of divestment in these cases. Linn and Rozeff (1984) argue that there are only two valid reasons for divestitures:

1. The assets are worth more as part of the buyer's organisation than as part of the seller's.
2. The assets are actively interfering with the seller's other profitable operations.

2.2 FORMS OF DIVESTITURE

Divestiture can be defined as the sale of a segment of a company (assets, a product line, a subsidiary) to a third party for cash or for securities (Weston et al, 1990, p.734). If this part is sold to its management, it is called a management buy-out. If the ownership is transfered to the same shareholders as the parent's, it is called a spin-off and if it is sold to an outside party it is called a sell-off. Each of these categories will be addressed individually. There are, however, other categorisations of divestiture. Coyne and Wright (1986) divide divestitures into six categories based on the nature of ownership severance, the relative frequency with which it takes place and the post-divestment ownership of the part disposed of. They regard franchising, contracting out and asset-swaps as forms of divestiture and offer the following definitions (pp.2-4):

> "Franchising is the means by which trade can take place. The precise form varies, but normally involves some kind of competition for the exclusive right to produce a firm's product or service in a particular area for a given period".

> "Contracting out has similarities with franchising in that firms engage in tenders for the production of a service. However, the distinction may be made that contracting-out involves the provision of a specific good or service to the parent company. To all intents and purposes, the contractor obtains a monopoly position for the period of the contract, and the service or good will be normally provided by a contractor who is a specialist in that area".

> "The case of asset-swap or strategic trade is treated separately because, strictly speaking, little if any funds change hands. Transfer of ownership is effected by exchanging some of the assets of one firm with some of those of another". It is

a match between what one company has which it wishes to dispose of and what another company is prepared to offer. Although an asset-swap can stem from the intention to divest a part of a business, it can also be regarded as a reorganisation of a company's assets with the help of a matching party who wishes to do the same. The payment, if any, is intended to equate the value of assets swapped.

It is also necessary to mention equity carve-outs. Equity carve-out is defined as a transaction in which a parent firm offers some of a subsidiary's common stock to the general public, to bring in a cash infusion to the parent without loss of control (Weston et al 1990, p.734). An equity carve-out is the initial public offering (IPO) of some portion of the common stock of a wholly owned subsidiary. These are also referred to as "split-off IPO's". The IPO of the common stock of the subsidiary indicates public trading in a new and distinct set of equity claims on the assets of the subsidiary.

However sell-offs, management buy-outs and spin-offs are the main categories of divestitures as far as we are concerned. These all originate from fundamental crises or opportunities within the internal and external environments of the parent and affect its shareholders. We analyse in the next sub-sections reasons for the choice of each method of divestment.

2.2.1 SPIN-OFFS

Corporate spin-off is defined as a transaction in which a company distributes on a pro-rata basis all of the shares it owns in a subsidiary to its own shareholders and creates a new company now owned directly by the parent

company shareholders, (Weston et al, 1990, p.745). In the case of a spin-off the existing owners maintain ownership in and control over the newly divested entity. Furthermore, the parent neither receives new funds nor incurs any expenses other than flotation costs in relation to the spin-off.

Corporate spin-offs are more common in the USA and their rate accelerated in the 1970's. There are also involuntary spin-offs. Commonly, involuntary spinoffs are the result of complaints filed by a US federal or state regulatory agency (Kudla and McInish, 1983, p.24). Federal complaints filed by the Federal Trade Commission or the Department of Justice usually allege violation of anti-trust laws, especially Section 7 of the Clayton Act. If the complaints are upheld, the target of the complaint may be ordered to divest.

2.2.2 REASONS FOR VOLUNTARY SPIN-OFF

Seven categories of reasons for spin-offs can be drawn (Kudla and McInish, 1983, pp.12-26):

I- MANAGERIAL CONSIDERATIONS

Often the operations of the spun-off subsidiary are so different from those of the parent that an independent management will benefit the subsidiary. Operating as a wholly-owned subsidiary under central management reduces the profit potential of what could otherwise be a profit making and growing entity under its own independent management. As an independent entity, the management would be expected to make the best use of their skills and environment in order to survive. They can no longer depend on the parent. The incentive to produce efficiently and profitably is much

greater under the new circumstances of independence. The operational and financial progress of the spun-off subsidiary will be more visible to shareholders, the separate business will require executives to generate growth and profits. There will be a clear basis for evaluation and correspondingly a more accurate basis for appraisal of performance of the management by employees, the public, and the investment community.

Schipper and Smith (1983) find that their sample of spin-off firms was characterised by diversity of operation and recent expansion. They suggest spin-off was used to segregate distinct business lines, presumably for reasons of imposed management efficiency. This is supportive of the management efficiency hypothesis and probably the reason behind the recent spin-off movement in the USA (Schipper and Smith, 1983, p.443). However, they do not rule out the possibility of market undervaluation of conglomerate assets as a reason for spin-off as explained below.

II- CAPITAL MARKET FORCES

The management of the parent might consider spin-off of a subsidiary if it is believed that the market value of the spun-off subsidiary plus the market value of the parent after spin-off would be greater than the market value of the parent with the subsidiary before spin-off (Miles and Rosenfeld, 1984).

Miles and Rosenfeld (1984) found favourable performance of firms' share prices following a spin-off. They find that firms with multiple lines of business are difficult to value because of a lack of accounting data and because few analysts track (or fully understand) multiple-industry firms. When a spin-off takes place, the spun-off part would need to provide

information and accounts of its own activities independent of the parent. Such availability of information could assist investors and market analysts to evaluate the worth of individual lines of business better than when the parent is reporting on overall group performance. In cases where the individual lines of business are undervalued, such availability of information through spin-off could raise the market value of the divested parts and thus the overall worth of the parent.

III- RISK EFFECT

In many spin-offs, the spun-off firm's activity is very different from that of the parent. When the operation of the subsidiary is more risky than the parent's, the parent management may consider disassociation from the risky subsidiary. Such a decision is seen to achieve reduced volatility of earnings and hence stability and reliable forward planning and growth of the parent, (Kudla and McInish 1983, p.19).

IV- TAX BENEFITS

There are areas of operations that may benefit from tax advantages if they are made independent of the parent. In the U.S.A., for example, if the company's principal asset is real estate, it may be able to qualify as a Real Estate Investment Trust (REIT). REIT may deduct dividends paid to shareholders from income before calculating taxes (Kulda and McInish, 1983, p.20). Tax related issues relevant to divestments in the U.K. are discussed later in this chapter under the sell-off Section 2.2.5.

V- MARKETING CONSIDERATIONS

Sometimes, firms spin off subsidiaries whose operations are not closely related to their primary activities, not for reasons of reducing risk but for marketing considerations. The reason offered is that such a move can allay fears of customers, suppliers and others, that these firms were not committed to, and might end participation in, their particular industries. Another example of spin-off motivated by marketing considerations is when the spin-off is designed to separate potentially incompatible product lines. Division of two incompatible parts is aimed to enhance each division in its effort to market its products (Kudla and McInish, 1983, p.23). Incompatibility can arise in marketing organisations and sales back up. For example, food and electronic products may require different types of marketing organisations.

VI- REGULATORY FACTORS

Regulatory factors have been the cause of both involuntary and voluntary spin-offs. Voluntary spin-offs have been made to separate regulated and unregulated businesses. For example CBS Inc., spun off Viacom International Inc. to comply with the rules of the US Federal Communications Commission (FCC), which prevented television networks from engaging in domestic cable television (CATV) operations and also severely restricted their ability to do business in the worldwide film syndication field (Kudla and McInish, 1983, p.24).

VII- LEGAL FACTORS

Voluntary spin-offs are sometimes made by firms as a means of overcoming legal obstacles which prevent the firm from accomplishing its objectives. For example the Bank Holding Act 1969, in the USA, requires companies whose business is not principally banking to divest themselves of ownership and control of a commercial bank (Kudla and McInish, 1983, p.26).

2.2.3 MANAGEMENT BUY-OUTS

The purchase of a subsidiary from its parent by the subsidiary's own managers is called a management buy-out. The division is then run by owner-managers. The buy-out arrangement is applicable to both the private sector and the public sector and is, therefore, one of the means of privatisation. There are many instances whereby the management buy the company from absentee shareholders, a current owner-manager, the receiver, etc. Divestment by management buy-out is not the focus of attention as far as this study is concerned.

There are times when purchase of the subsidiary is not directly affordable by its current management. When the purchase is largely financed by debt the term leveraged buy-out is often used. If the management is prepared to pay the market price for the division, the parent may decide to sell the subsidiary to its management. Often the existing management is prepared to pay a higher price than an outside firm as their dream of owning their own business can suddenly come true in a collective way. Managers whose jobs might otherwise be in jeopardy tend to accept highly leveraged buy-outs. Their hopes for increased

efficiency, productivity and profit stem from the fact that they all now care more and have no one to rely on for their salaries but their own joint effort. Furthermore, they have inside information on the real value of the subsidiary and may thus be prepared to pay a higher price than the market.

Management buy-outs increased during the 80's since: a) the number of divestments as a whole increased, b) finance was made available for leveraged buy-outs, c) it was a convenient way of divesting and d) the relationship of the parent with the subsidiary could still be maintained if needed. Management buy-outs in the UK grew during the 80's both in total value and average value. The share of all acquisitions accounted for by buy-outs and buy-ins rose sharply to almost a third of the total volume at 31.8% in 1989 and 22.1% of value in 1989 (Wright et al, 1992). However, in the first half of 1990, acquisitions of independent companies and buy-ins both fell sharply. Buy-ins are defined as the purchase of an equity holding by a new management team. The joint share of buy-outs and buy-ins in all takeovers by value reached a peak of 26.6%. Their share of volume was 34.9%, which was the highest since 1985. In 1979 these were only 3% of all acquisitions (Wright et al, 1992).

According to Stallworthy and Kharbanda (1988): i) management buy-outs may lead to a revitalisation of the company and later resale or flotation of the company on the stock market. ii) The time between management buy-out and floatation on the stock market has been getting shorter. iii) There is a tendency to increased gearing (debt/equity) ratio in management buy-outs. iv) There are cases where managers have paid too high a price for the subsidiary and have eventually sold

at a loss to another company or gone bankrupt. v) Based on the US experience, management buy-outs with the following characteristics have generally been found to be sound (Stallworthy and Kharbanda 1988, p.174):

1) Strong, stable earnings history with a predictable cash flow.
2) Growth, but not too fast.
3) A well defined niche in the market.
4) Are not too capital intensive and do not require much capital in near future.
5) Have a strong proven management.

In general, if the profits of a subsidiary are dependent more on the management and labour force than on its capital investment and technology, a divestment by management buy-out would be expected to enhance performance. From the parent's point of view, the subsidiary would thus be of greater value to its existing management than to an outside investor as a detached independent entity. Therefore under such circumstances the parent might choose to divest by management buy-out in order to fetch higher sale proceeds. Some conditions for a successful management buy-out from the point of view of the vendor and the MBO team might be:

a) the management is prepared to pay the required price.
b) a quick and quiet internal sale is preferable to the parent.
c) sale to management will better preserve the overall reputation of the parent.
d) there is a personal bond such that the internal management will be preferred.
e) there is sufficient hope and commitment on the part of the parent and the future management of the divested part to make the buy-out a success.

UK evidence from two surveys covering the first half of the 1980's (Wright, 1986; Wright, Chiplin, Thompson and Robbie, 1990) shows that almost two fifths of the bought-out divisions or subsidiaries sold their products and services to the former parent. Around one quarter of buy-outs were found to purchase goods from their former parent. However, for the most part, these links account for a relatively small share of the buy-out's sale and purchases. Buy-outs from non-UK parents were found, on average, to have a higher portion of sales and supplies relations with their former owners than was the case with those acquired from UK parents (Wright, Chiplin, Thompson and Robbie, 1990). UK parents were generally customers and non-UK parents were suppliers to the divested part.

2.2.4 SELL-OFFS

However key to this thesis is the sell-off. A sell-off is defined as the sale of a part of a business to an independent buyer. It is the traditional method of disposing of a subsidiary. Following a major acquisition the unwanted portions are often sold off. A sell-off may result from financial, organisational or strategic considerations raised by internal development and growth, or may follow an acquisition. In the latter case a single acquired company may be split into several parts for multiple sell-offs or several acquisitions may be grouped for a single divestment. In 1980's a new form of acquisition emerged in the US, termed "bust-up" take-over, in which companies were acquired and quickly dismembered because the company was valued in aggregate lower than the sum that could be realised by reselling the pieces separately.

Examination of US data for the years 1963 - 1983 reflects a strong relationship between annual rate of change in merger activity in any given year,

and the annual rate of change in divestiture in the years after. Linn and Rozeff (1986, p.435) find a strong statistical relationship between the annual rate of change in merger activity in any given year, and the annual rate of change in divestitures two years after. In other words, if the rate of mergers jumps we expect that the rate of divestitures will rise sharply within one to two years thereafter. Conversely, if the merger rate declines we can predict that the divestiture rate will fall several years later.

Porter (1987) compiled data on a sample of 33 US Companies over the period of 1950-1986. Each company on average entered 27 new sectors or fields (e.g. financial services) and 80 new industries within the existing field of the company (e.g. insurance). About 70% of each entry was made via acquisitions. On average his sample firms divested 53.4% of acquisitions in new industries and 60% of acquisitions in new fields. When acquisitions were in fields unrelated to the companies' existing fields, the rate of divestiture was 71%. Company divestiture to acquisition ratios up to 1980 range from 87% down to 17%. Similarly W.T. Grimm (1987) data shows divestiture to acquisition ratios for the years 1975 to 1987 ranging between 35 to 54%. Such high divestiture/acquisition rates could be interpreted as signs of dynamism among US firms, and a contribution to resource mobility within an enterprise economy.

A large survey of US acquisitions and divestments by Ravenscraft and Scherer (1987, pp.159-191) throws some light on the nature of divestment activity. It shows that units acquired and later divested were on average in robust good health at the time of their acquisition, but became gravely ill thereafter. It is estimated that one third of acquisitions made during the 1960's and the early 1970's in the US were subsequently resold. Acquired units were much more

likely to be subject to divestiture, than lines already operated by the parent company in 1950. Declining profitability at the line of business or company level or both, characteristically preceded a sell-off. Change in top management encouraged the divestiture of acquired lines of business as the new management had less personal attachment to existing lines. On the other hand, a strong market position, reflected by high market shares and/or a large prior investment in research, diminished the probability of sell-off. No evidence was found by Ravenscroft and Scherer to support the argument that R & D and advertising spending were cut back by the parent disproportionately in anticipation of a sell-off. Their study finds that sell-off tends to occur in response to profit performance deemed unsatisfactory by corporate management. They also found that for both acquired and original lines, sell-off was on average a manifestation of financial distress, that is, severe financial pressures precipitated the decision to sell. Following sell-offs, substantial efficiency increases often occurred under the new organisational structures established following divestiture.

In the UK, Wright (1988) shows that buy-out targets were usually owned only for a small portion of their lives by the divesting parent before they were purchased by an MBO team. In respect of sell-offs, Chiplin and Wright (1980) show that over a quarter of the firms which divested in the two year sample period they examined engaged in more than one divestment, with 4% undertaking at least four sales of subsidiaries. From January 1984 to June 1986, some 16% of the acquiring firms in the UK divested subsidiaries either to another group or to incumbent management (Wright et al, 1992).

Companies Act 1989 requirements enable the Director General of Fair Trading to discuss with the parties involved possible modifications to merger

proposals, usually involving the divestment of some of the assets of the merging business in order to avoid reference to Monopolies and Mergers Commission (MMC). Divestment may be ordered without reference to the MMC if legally binding undertakings, to dispose of the required assets within a given period, are not honoured. Recent recommendations of the MMC in respect of divestment include requirements to divest the whole of an acquisition; divest the offending part of a larger acquisition; reduce the shareholding in its target. In many cases the MMC has sought to obtain undertakings from the parties concerned and has proposed divestment if such undertakings to dispose of assets cannot be agreed (Wright et al, 1992).

As far as tax issues are concerned, it is comparatively rare for taxation considerations to be the driving force behind corporate restructuring (Dicker 1990, p. 99). It is, however, argued that the replacement of equity by debt in the form of leveraged buy-outs in the United States is tax-driven. There are three ways of divesting (Attwood, 1988):

1. Selling the shares of an existing company.
2. Transferring the divested asset/operation into a new company and selling shares of the new company to the acquiror, the so called "hive down".
3. Direct sales of assets.

The divestor is primarily interested in the capital gains cost of selling. No capital gains will be paid on the sales of assets of the divested part if the divested unit is sold as an existing company rather than a combination of assets. The

divested company will cease to be a member of the group with losses or charges on income transferred to the parent up to the date of divestment. If divestment is in the form of sale of shares, any capital loss from such sales may be used to shelter gains arising elsewhere within the group. The parent may choose to pay an intragroup dividend out of the profits of the divested unit immediately prior to its sale. This will provide the parent with tax-exempt income and, by depressing the value of the divested company's shares, reduce or eliminate the chargeable gain on the sale of those shares. Such taxation considerations affect divestment decision in terms of form and value to the parent. The parent may decide to delay or bring forward a divestment decision due to taxation considerations. However, divestments are unlikely to be triggered mainly by tax issues as there are other major strategic and economic issues that drive the divestment decision.

This study concentrates on sell-offs in the UK and their impact on shareholder wealth. As in the US studies, we expect to find that a sell-off announcement has a clear impact on the market. Chapter 3 reviews the US research to date and highlights the economic and research issues addressed in the various studies.

Chapter 2 highlighted the fundamental reasons for divestment such as strategic change, the need for cash and management problems. Forms of divestments were briefly explained and attention was focused on sell-offs as the topic of this research. It was explained that corporate restructuring through divestments should in principle help put the parent into a shape where it is more fit to survive, compete and produce profits. One would therefore, in general, expect the announcement of a divestment to be received as good news by the

market leading to a boost in share prices and produce an "excess" or "abnormal return" ie abnormal relative to the market. Mathematical definitions and methods of calculation of the abnormal return metric are discussed in Chapter 4.

In Chapter 3, we review the previous studies that have measured the excess returns over announcement day or period. Our review will demonstrate that sell-off announcements, in general, are associated with excess returns which are also gains to shareholders. However, the magnitude of these gains varies from case to case. Researchers have sought to explore the underlying relationships between sell-off characteristics and excess returns by forming various categories of sell-offs and measuring abnormal returns for each category. For instance, aggregate abnormal returns from categories of sell-off price declarers and non-declarers have been compared. Such analysis has revealed many reasons for differential positive and negative market reactions over the announcement period.

Chapter 3 will begin by briefly highlighting US sell-off studies and their overall results. It will then concentrate on the issues researched and report the findings of these studies. It ends by previewing the issues that are investigated in this study. The methodology employed is described in Chapter 4.

Chapter 3 REVIEW OF LITERATURE

Chapter 2 outlined the main forms of divestiture and sought to explain the causes of divestiture. The impact of the divestiture announcement on the stock price of the divestor has been a focus of interest for researchers. In addition to assessing the general impact of the announcement on shareholder wealth, researchers have also attempted to discover the underlying reasons for the impact on stock returns. This chapter will begin by reviewing the extant research and highlighting key research issues and results. We shall then define the research areas addressed and framework of this study and explain our analytical approach. Our hypotheses and research methodology are set out in Chapter 4. Results then follow in Chapter 5.

Generally, the sell-off announcement has been shown to be associated with risk adjusted excess returns accruing to the divestor shareholders. With the exception of Alexander, Benson and Kampmeyer (1984) and Denning and Shastri (1990) sell-off studies have demonstrated such risk adjusted excess returns to be statistically significant. These studies include Boudreaux (1975), Hearth and Zaima (1984 and 1986), Zaima and Hearth (1985), Jain (1985), Rosenfeld (1984), Klein (1986), Tehranian, Travlos and Waegelein (1987), Hite, Owers and Rogers (1987) and Hirschey, Slovin and Zaima (1990). Similar statistically significant risk adjusted excess returns are observed for spin-offs (eg, Schipper and Smith 1983; Miles and Rosenfeld 1983). Schipper and Smith (1986) report the same for equity carve-outs and Hite and Vetsuypens (1989) demonstrate similar results for MBO's.

Hite, Owers and Rogers (1987) suggest that these results may be due to inefficiencies in the current operating policies and/or organisational structure of

divesting firms. Klein (1986) supports the view that asset sales are associated with the movement of economic resources to higher valued users. Tehranian, Travalos and Waegelein (1987) find that divesting firms with long-term compensation plans experience a more favourable sell-off announcement effect than do firms without such a method of compensation, suggesting that such compensation plans bring the interests of managers and investors in line with each other and the management sell-off decision reflects this convergence of interests.

In Chapter 2 we explained how divestiture could be used as a management response to the need for strategic change. Montgomery, Thomas and Kamath (1984) argue that voluntary divestitures that are part of clearly identified strategies should create more value than divestitures that take place in a reactionary or piecemeal manner or divestitures arising from unidentified or short term performance criteria. They compare sell-off announcement abnormal returns across five different categories of divestiture viz:-

1. Strategic divestiture, that is a divestiture related to corporate or business level strategy, eg. to exit an industry, to move away from or towards "core" businesses or to realign a firm's product mix within a given industry.

2. Selling undesired units, that is, divestitures as a means of ridding the firm of unwanted units and with no link with specific strategic aims.
3. Selling in response to liquidity concerns, that is, divestitures in response to bankruptcies, near bankruptcies or extended period of loss.
4. Forced divestitures, that is, divestitures required by US Federal agencies.
5. Undiscussed divestitures, that is divestitures on which the divestor did not comment.

Montgomery et al (1984) find that divestitures that were part of integrated, strategic plans exhibited large positive stock market effects. In contrast, the group of routine, non-strategic divestitures was associated with negative stock price effects. The remaining categories of divestitures, including those undertaken because of liquidity needs, government pressure, or unstated reasons, exhibited non-significant changes in stock prices. These results support the view that divestiture decisions should be grounded in careful strategic analysis that links the unit in question to broader firm goals.

Porter (1976) and Harrigan (1981) have written about structural, strategic and managerial exit barriers that can delay exit decisions. Porter (1976) found that such exit barrier measures to be important predictors of non-divestment of unprofitable businesses, suggesting that 'barriers to exit' stand in the way of some divestment decisions. Even less tangible than exit barriers that can reduce the divestiture prospects are the subtle costs of disuniting. These factors include emotional issues, such as employee morale and face-saving and transaction costs (the cost of executing the transfer of division to the new parent) surrounding separation. Denning (1988), as explained later in this chapter, also shows that the effect of divestment is significantly related to the motivation behind it. Where loss making operations are divested, management may generate a significantly positive impact on shareholder wealth. Furthermore where units are sold to managers, as a means of dealing with agency cost problems, positive but insignificant divestor shareholders' wealth improvements occur.

Jain (1985) confirms higher positive abnormal returns occurring for sellers than for buyers of divestments. Sicherman and Pettway (1987) found significant positive announcement effects for acquirers of divestments which had product line relatedness

and negative effects for the acquisition of unrelated divested assets. Acquisitions of product-line related assets from financially weak divestors produced positive but not significant abnormal returns. However, purchases of related assets from non-weak parent firms yields highly significant cumulative abnormal returns. Hite et al (1987) show positive benefits for both sellers and buyers when transactions are completed. Rosenfeld (1984) suggests that the weak positive abnormal results obtained by Alexander et al (1984) may be due to smallness of relative size of the divested part to the parent. Klein (1986) finds significant positive abnormal returns for relatively large sell-offs and sell-off announcements that incorporate price. In the absence of price information on announcement, Klein (1986) finds returns not to be significantly different from zero. Zaima and Hearth (1985) find relative size of sell-off to parent has a positive relationship with the abnormal returns produced. Denning and Shastri (1990) explicitly choose fifty large single corporate divestitures with no other confounding news releases during the announcement period and found the abnormal returns obtained to be statistically insignificant across the entire time horizon surrounding the divestiture announcement and completion. This result was, thus, contrary to all previous studies except that of Alexander et al (1984).

Research to date has examined a number of factors that might possibly affect the magnitude of the market reaction to the sell-off announcement. Such studies have concentrated on the following areas:

a) The impact of price disclosure accompanying the sell-off.

b) The certainty of the sell-off deal completion.

c) The relative size of the divested part to that of the parent.

d) The movement of the abnormal return at various stages of announcement and completion.

e) The impact of information on the divestor's long term performance plan for management.

f) The impact of the declared management rationale for divestment.

g) The confounding effect of other news/divestments.

h) The financial strength of the divestor.

i) Insider trading, ownership structure and market assessment of corporate sell-offs.

j) Financial and managerial factors leading to and influencing the decision to divest such as debt/equity ratio and personal attachment of managers to the unit being considered for divestment.

3.1 PRICE DISCLOSURE

Price declaration is an important factor in influencing the magnitude of the announcement impact on the market for two main reasons. Firstly, it provides the market with an assessment of the sell-off deal in terms of net present value. Secondly, the availability of an agreed price demonstrates to the market that negotiations between parties are well advanced and major issues are clarified and prices agreed. The availability of price provides some comfort to the market that the deal will be completed.

Klein (1986) divides her sample of sell-off firms into those that have declared the price on or after announcement and those that have not declared the price. She finds that divestment announcements with price declaration produce on average 2.5% excess (abnormal) returns with t statistics of 3.41 which is significant at the 1% level and divestment announcements without any price declaration generate mean abnormal returns of only 0.02% which is statistically insignificant (t-statistic = 0.06). The difference between the returns to the two sub-samples is also highly

significant.

3.2 CERTAINTY ASSESSMENT

Divestment announcements may take the form only of a stated intention to divest, i.e. an intention announcement, with no certainty of the deal reaching completion stage. However, if at this stage a price is also announced then as explained earlier some advance towards the consummation of the deal may be presumed. On the other hand, announcement of divestment may often be made only after the deal has been completed i.e. a completion announcement. Such an announcement may not always contain price information.

Hearth and Zaima (1986) aim to assess the impact of lack of certainty of completion by studying the movement in abnormal returns before announcement, between announcement and completion, and after completion. Positive abnormal returns are found prior to announcement but only random abnormal returns after completion. The stock market continues to react to a sell-off during the period between the announcement and completion dates. Unlike the pre-announcement period, however, the significant total abnormal returns are not positively skewed. There are positive and negative movements. Hearth and Zaima (1986) suggest that some uncertaintity with respect to the divesting firm is resolved during the interim period, though in some cases the resolution leads to negative price movements. These negative movements could also be interpreted as price adjustments to over-speculation over share prices during the pre-announcement period. Hearth and Zaima's (1986) analysis does examine the market response during the overall divestiture but does not conclusively demonstrate a relationship between the degree of certainty of a deal being completed and market valuation, as is done in this thesis.

Klein (1986) uses price disclosure as a proxy for the probability of success of a deal reaching completion stage. This assumption leads to her comparative study of the impact of price declaration on sell-offs that had been announced at the intention stage and those that had been announced on completion.

Table 3.1 displays the results of Klein with a slight change in terminology. The results reveal the highest gains for price declarers on announcement of intention and negligible gains for the no-price samples irrespective of completion/intention. Klein then regresses the 3 day cumulative abnormal returns, (CAR's for days -2 to 0), on price as a dummy variable and relative size (see Section 3.3 below) and finds relative size is also significant.

Table 3.1 - CAR (%) and t-statistics for Klein (1986) Price vs No-Price and Intention vs Completion sub-samples.

SAMPLE	Price	No Price
Completion CAR (-2,0)	1.62%	0.02%
t- statistics	(2.23)[b]	(0.49)
Sample size	N=76	N=87
Intention CAR (-2,0)	6.79%	0.02%
t- statistics	(2.97)[a]	(0.03)
Sample size	N=15	N=37

Note: (1) [a, b] indicate 1% and 5% levels of significance.

(2) The term, "intention", is used as a substitute for the term "consideration stage" and the term "completion" is used as a substitute for "agreement reached".

A further regression with the addition of agreement reached (completion)/ not reached (intention) as a dummy variable in the equation results in:

a) No reduction in the explanatory power or the magnitude of the price and relative size variables. This suggests that the market is not using the price declaration as a proxy for the probability of deal completion.

b) A negative slope for the agreement reached (completion) parameter.

Klein found these results counter-intuitive and was unable to explain why the market appears to react more positively to a price declaration without a signed agreement than to a price declaration with a signed agreement. She is thus forced to discard price declaration as a proxy for possibility of success, i.e. certainty of the deal being completed. Klein's study explores the importance of price declaration and relative size on abnormal return gains. The differential impact of a completion versus intention on announcement irrespective of price disclosure is not studied. In this study the analysis of uncertainty is approached by testing:

a) The differential impact of a completion announcement versus an intention announcement irrespective of price declaration. This tests the impact of the certainty of the sell-off being completed.

b) The marginal impact of price declaration on sub-groups announcing either intention or completion. This tests for the certainty over the value of the sell-off.

Although Klein does subdivide her samples into the same four categories of price/no-price and intention/completion as we do, she does not test for the impact of price and completion announcements in the same way as this study does.

3.3 RELATIVE SIZE

The relative size of divestment is the ratio of the divestment price to the market capitalisation of the divestor. Zaima and Hearth (1985) and Klein (1986), as seen earlier, demonstrate a positive relationship between the relative size of divestment and the abnormal return produced on announcement. Such a relationship would seem plausible as the gains from a larger sale would be absorbed by a smaller remaining parent thus having a greater relative impact than a divestment of smaller relative size, ceteris paribus.

3.4 FINANCIAL STRENGTH OF DIVESTOR

Zaima and Hearth (1985) aim to assess the impact of the financial strength and bargaining position of the divestor on the abnormal returns to sell-off announcement. Standard and Poor's common stock rankings are used as a rough guide to the financial status of the seller. These ranks are based on historical trends of a variety of measures of profitability and financial strength focusing on earnings and dividends. Sellers are classified as of 'good' financial status if their Standard and Poor's rankings are A^+, A, or A^-, while sellers whose rankings are below A^- are classified as having 'poor' financial status. Zaima and Hearth provide evidence that the stronger the financial position of the seller, the larger the positive excess returns.

The rationale for using financial strength in the study of Zaima and Hearth (1985) is to assess the impact of the strength in the negotiating position of the divestor in achieving a more favourable deal, thus finding a positive relationship between financial strength and excess returns on announcement. In our study we assess the excess returns in cases where divestment may have originated from a financial crisis and is aimed at avoiding bankruptcy. This aspect of financial strength, relating

explicitly to bankruptcy avoidance, is an issue of more general concern, than the focus of Zaima and Hearth's study. In this thesis the Z-score (Altman, 1968) is used as a measure of financial strength and bankruptcy potential as explained later. (See Section 4.9).

3.5 INSIDER TRADING, OWNERSHIP STRUCTURE

Hirschey and Zaima (1989) argue that the market assessment of corporate sell-off decisions is made within the context of other available information that facilitates the characterization of the sell-off event as favourable or unfavourable for divesting firm shareholders. Examples of such information are management earnings forecasts, ownership structure and insider trading. It would be logical to assume that if a sell-off announcement is expected to increase the share price, the management would try to purchase company shares prior to announcement. Penman (1985), for example, explores the impact of insider trading by evaluating the information content of managements' earnings forecasts within the context of insider buy/sell decisions. Penman (1985) finds consistently positive daily mean abnormal returns when higher management earnings forecasts are accompanied by high levels of insider net-buy activity. It can also be argued that investment and financial decisions are indeed more compatible with stockholder interests when managers hold a substantial ownership interest. The market assessment of investment or divestment decisions could indeed then vary according to the ownership structure of the firm.

Agrawal and Mandelker (1987) and Sicherman and Pettway (1987) find ownership structure of the firm can have important implications for investment and financing decisions. Specifically, Agrawal and Mandelker (1987) report that investment and financing decisions tend to increase the variance of investment

returns when managers have significant common stock and option holdings. Conversely, these decisions tend to reduce the variance of returns when managers hold little ownership interest. Both studies conclude that executive holdings of common stock work to reduce agency problems related to managerial decisions.

Consistent with the findings of Penman (1985), Agrawal and Mandelker (1987) and Sicherman and Pettway (1987), Hirschey and Zaima (1989) hypothesise that sell-off decisions by closely held firms with recent insider net-buy activity are viewed by the market as likely to be compatible with stockholder interests. They find a highly positive market reaction to sell-offs by firms with net-buy activity in the six-month period immediately preceding the sell-off announcement. The positive market reaction is less evident for firms displaying insider net-sell activity during the same period. Similarly, the market seems to regard more favourably the sell-off decisions of closely held versus widely held firms.

Hirschey and Zaima (1989) subdivide their sample of sell-offs into four subsamples of net-buy/closely held, net-buy/widely held, net-sell/closely held and net-sell/widely held and study the market reaction to the sell-off announcements of each sub-group. They find the market reaction runs from very favourable for insider net-buy/closely held firms to neutral for insider net-sell/widely held firms. These findings demonstrate that insider trading and ownership structure data appear to convey information that is used by investors in their evaluation of sell-off decisions.

3.6 LONG TERM PERFORMANCE PLAN

Management long term performance plans are designed to help commit managers to longer term goals when making investment decisions. The interests of management and stockholders can significantly diverge when firms make

investment decision (Mikkelson and Ruback, 1985). Managers who are not induced to focus on long term profits may be motivated to aim for short term profit performance, perhaps at the expense of the longer term, so as to improve perceptions of their abilitiy and earn higher salaries and bonuses (Narayanan, 1985). Research shows that the announcement of the adoption of long term performance plans produces statistically significant positive abnormal returns (Larcker, 1983; Brickley, Bhagat and Lease, 1985). Tehranian, Travlos and Waegelein (1987) document the following:

a) Announcement of a sell-off by a divesting firm compensating its executives with a long term plan is associated with a favourable security market reaction with average abnormal return of 0.65% for days (-1 to 0) (t = 2.25, significant at the 5% level).

b) Announcement of sell-offs by divesting firms not compensating their executives with a long term performance plan is not associated with a favourable security market reaction producing average negative abnormal returns of -0.15% for days (-1 to 0) (t = -0.64).

It would be of interest to see how many of the sample sell-offs in Alexander et al (1984) leading to statistically insignificant abnormal negative returns are companies that had no long term performance plans for their management. In this research this issue is not considered due to data non-availability problems.

3.7 MANAGEMENT MOTIVES

Karen Craft Denning (1988) explores the impact of managerial motivations on the magnitude of abnormal returns surrounding the divestiture announcements by categorising different managerial motivations for sell-offs and spin-offs and

observing abnormal returns produced before, between announcement and completion, and following completion of such divestments. Six basic hypotheses about corporate divestment are considered:

1. No Effect Hypothesis: In perfect capital markets, it may be that the divestment of a division is no different from the divestment of publicly traded stocks or bonds from the firm's portfolio. Therefore no abnormal returns would be expected to be earned, if value additivity is preserved. According to the value additivity principle, the value of the divested part and that of the remainder of the parent together should not be any different from the original value of the parent.

2. The Wealth Transfer Hypothesis: As Galai and Masulis (1976) point out, after divestment there are fewer assets backing the firm's debt and therefore the market value of debt decreases. Since the value of the firm is the sum of the values of debt and stock, a constant firm value implies that a decrease in the value of debt must be accompanied by an increase in stock value. Furthermore, wealth transfers might be due to the sale or spin-off resulting in an increase in the variance of the parent company returns.

3. Losing Operations Hypothesis: Costly bankruptcy or financial distress is regarded as a market imperfection and may be viewed as a motivation for divestiture. Such a suggestion has been made by Denning (1988), who reports on an unpublished study by Magiera and Grunewald (1987), and also by Hite, Owers and Rogers (1987). A firm may divest a unit due to its loss-making operations or due to a desire to isolate the assets of the firm from unprofitable assets in the unit. Additionally, assets may be divested to meet debt service payments or to increase liquidity and thus reduce the bankruptcy probability of the parent.

4. Agency Problem Resolution: As explained in Chapter 2, firms may divest due to an agency problem, (Jensen and Meckling, 1976). Two such problems are under-investment and managerial behaviour that does not maximise value. In the case of under-investment, Myers (1977) presents a theoretical argument that the presence of debt in firms that are otherwise value maximising can cause firms to forego profitable investment opportunities because the benefits go to the bond holders. Therefore the parent may divest in the form of a "spin-off" to enable the shareholders to benefit from growth opportunities without enabling the bond holders to do so. In the case of managerial behaviour, divestment can be seen as a way of enhancing managerial performance by separating differing managerial units or by providing some managers with an ownership interest in the firm.

5. Good News Information: The market interprets the net present value of a divestment to be positive. If firm value can be increased by divesting, the parent receives an economic gain from doing so, and stock values reflect this gain.

6. Bad News Information: The divestment news could be indicative of management's negative perception of the firms situation such as poor liquidity, losing operations, inefficiencies, negative synergies, (Linn and Rozeff, 1984).

Denning (1988) examines the stockholder wealth impact in concert with the rationale offered by corporate management for evidence that the divestment has had its intended impact. She finds that, when divesting firms are categorised according to managerial motivations for divestment, as expressed by management, the market's response to announcements within the same categories are similar. Denning (1988) finds that:

a) Single major divestments are frequently associated with change in return volatility but are infrequently associated with significant change in divestor mean return. There are, however, two exceptions:

   i) sell-offs of losing operations lead to significantly positive abnormal returns during the announcement period (AD -6 to AD +6) where AD is the announced date of intention to divest;

   ii) spin-offs lead to larger mean returns to stockholders during the divestment period (DD-6 to DD+6) compared with pre-announcement period (DD-25 to DD-7) and post divestment period (DD+7 to DD+259), where DD is the divested date.

The changes in the return volatility as a proxy for changes in the variance of returns on the firm's assets also indicate that the divestment impact varies with categorisation of the sample. A discussion of stock return variance as a proxy for firm return variance is presented by Eger (1983) and Agrawal and Mandelker (1987). The agency problem sample firms generally show a post-divestment variance decrease, while the losing operations and spin-off categories generally evidence a post-divestment variance increase.

Denning (1988) concludes that her results indicate that the parameter changes associated with divestiture vary depending on the motivation for divestment. Categories appear quite different from one another in mean returns and variances. When firms are categorised according to managerial motivations for divestment, a more meaningful interpretation of the divestment effects is feasible.

3.8 CONFOUNDING EFFECT OF OTHER NEWS

Denning and Shastri (1990) examine only firms with single, large divestments with no other announcement made during the period surrounding the announcement. Consistent with Alexander, Benson and Kampmeyer (1984), they find no significant announcement or divestment period excess returns. This result is contradictory to the findings of other studies reviewed earlier. Denning and Shastri suggest that the samples of sell-offs used in other studies suffer from confounding news or events.

In our study only single divestments above £250,000, where price is declared, are considered without screening for simultaneous release of other non-divestment news, as in the study of Denning and Shastri (1990).

3.9 FACTORS INFLUENCING THE DIVESTMENT DECISION

Duhaime and Grant (1984) consider divestment of whole business units or divisions of large diversified firms and investigate the impact of the following factors on the divestment decisions by firms:

a) **Firm financial strength:** The following measures were selected as indicators of firms' financial strength or weakness. This is measured by **i)** return on equity, **ii)** debt/equity ratio, **iii)** dividend paid as a percentage of earnings.

b) **Unit strength:** This is measured in relative terms to other units and based on the performance of the divested unit against the budgeted performance. Persistently under-performing units or loss making operations pressurise management into considering divestment.

c) **Unit interdependency:** This is a measure of how much other units depend on the unit considered for divestment. Duhaime and Grant find that units that are very little depended upon by other units are divested once the divestment option is chosen.

d) **General economic environment:** As one might expect, divestment is more seriously considered during a contraction than an expansion phase of the economic cycle. Under economic pressure firms are forced to preserve the activities they are successful at and dispose of their less successful activities.

e) **Managerial Attachment:** The personal attachment and involvement of divestment decision-makers in the affairs of units which are divestment candidates. One would expect emotional resistance in divestment of units that the decision makers have personal involvement and attachment to.

Duhaime and Grant (1984) find that financial strength, tested by a number of alternative measures, yields mixed results. The data shows that divestment decisions were generally made when firms' performance levels were below those of their industries. It appears that firms' competitive performance is an important influence on their decision to divest. The hypothesis that divestment decisions would generally be made in periods of economic contraction is not supported by the data. More instances of low managerial attachment than high are reported, but the difference is not statistically significant.

In the UK the recession of the early 1980's is said to have increased the number of divestment taking place (Coyne and Wright 1982). In a UK study of divestments, Thomas (1986) pointed out four likely considerations in a decision to divest:

i) the scale of resources that would be required if a situation were to be corrected along side other businesses within the parent.

ii) the expectation as to viability of the problem subsidiary, assuming an appropriate support can be mounted.

iii) the strategic importance of the group's long term aims.

iv) other options open to the group if it were now to pull out of the activity proposed to be divested.

3.10 METHODOLOGICAL ISSUES

All the US studies of divestments have followed the Brown and Warner (1985) or Dodd and Warner (1983) event study methodology. Details of this methodology, which is adopted in this study, are explained in Chapter 4. However, some of the related issues arising from the literature review are discussed below.

3.10.1 SAMPLE SIZE

Jain (1985) used a sample size of 1064 sell-offs but his results are similar to those of Hite, Owers and Rogers (1987) with a sample size of only 42, suggesting that sample sizes of about 40 may be adequate for such event studies. Klein (1986), in fact, makes inferences with a sub-sample of 15 (her "Intention Price group").

3.10.2 ESTIMATION PERIOD

Estimation period is a period well outside the event period used for measuring the relationship between a security's price movement and that of the market. The reason for separating the estimation period from the event period (also called observation period) is to ensure that the estimated parameters are measured under normal market conditions and are not affected by the event under investigation.

Various estimation periods have been adopted in the reviewed studies. Jain (1985) uses days t=-480 to day t = -360, as his sample of sell-off firms tend to perform poorly in the period immediately before announcement. To test for any changes in results due to the different estimation periods, Jain (1985) also applies parameters obtained from a post-divestment period of 120 days. However, similar results were found to those obtained using the pre-announcement period of -480 to -360 days as the estimation period.

Alexander et al (1984) adopt pre-event (-150 to -30 days), post-event (30 to 150 days) and a combination of pre and post event estimation periods. The reason for using a post-event estimation period is that there is the probability that the firm has changed following divestment and the same pre-event model of the firm may not be appropriate for predicting post-event returns. Using the mean adjusted returns model, they argue that the pre-event data is appropriate for estimating the pre-event abnormal returns and post-event data is appropriate for estimating the post-event abnormal returns. Therefore, both periods should be used separately for estimating abnormal returns. This so called 'both-but-separate' procedure for the estimation periods is recommended. The reason is that the mean of standardised residuals obtained during the pre-event period is biased with respect to post-event standardised residuals and vice versa. However, when using the market model the tendency is to be content with pre-event data alone (Zaima and Hearth, 1986; Klein, 1986). Such application assumes no significant change in betas following divestitures, a view which is supported by Magiera and Grunewald (1978), Choi and Philippatos (1982) and Klein (1986). In this research pre-event data from t =-180 to -40 is used to keep well separated the event and pre-announcement performance of returns although this does not avoid the problem of post-event β change.

3.10.3 CHOICE OF PREDICTION MODEL

A prediction model is a model of the relationship between individual security and market returns estimated under normal market conditions. Such a model is used to predict the security return in the absence of an event taking place on a given date. Any difference between the predicted return and that actually observed following the event is called the abnormal or excess return.

Studies of divestment have used the Mean Adjusted Model, the Single Index Market Model and the Market Adjusted Model for predicting normal returns and hence calculating abnormal returns resulting from the divestment event. We discuss these methodologies in Chapter 4.

3.11 THE PRESENT RESEARCH

In addition to studying the impact of sell-off announcements on shareholder wealth, in the present comparative UK based study the following issues are examined:

1) The effect of the degree of uncertainty of the divestment deal being completed.
2) The effect of the degree of uncertainty about the price of the deal
3) The relationship between the financial status of the divestor and wealth gains to divestor shareholders.
4) The relationship between the relative size of divestment and the wealth gains to divestor for shareholder.

The above issues are treated in the present research in the manner explained in the following sub-sections.

3.11.1 CERTAINTY ASSESSMENT

The effect of certainty of divestment is measured by grouping the announcements into two sub-groups:

a) Intention Group - those divestors that announce only the intention to sell-off.

b) Completion Group - those divestors that announce the completion of divestment first without prior announcement of intention.

Comparison of the results of these two sub-groups is expected to indicate the impact of the degree of certainty of completion of divestment reflected in the announcement on shareholder wealth. In the absence of news of sell-off completion, market reaction will be affected by speculation as to whether the deal will be consummated or not. Our approach to measuring the impact of degree of certainty is original and contributes to the field of divestment studies. Note, however, that in creating a sub-group of completed divestments we make an inherent assumption that the first public announcement of a completed divestment has not been preceded by leakage of the news of the intention to divest. In other words we assume that both the intention and contemporaneous completion events are separately and clearly recorded. The Intention sub-sample in comparison includes both successful divestments that are later publicly declared completed and unsuccessful divestments later abandoned.

We would expect that this Intention sub-sample should give a clear indication of the impact of an announcement that may or may not be completed. One would also expect the news of completion of divestment to have leaked more than that of intention to devest, as in the former case more people, such as bankers, accountants and solicitors, will have been involved before the deal is

finalised. However, the same source of public announcements is used for identifying the members of both Intention and Completion sub-groups, namely Acquisitions Monthly. In doing so we are at least confident that the completion announcements included in our sample have not been preceded by announcements of intention to divest.

3.11.2 PRICE DECLARATION, RELATIVE SIZE AND FINANCIAL STRENGTH

Unlike Klein (1986) who has assessed the impact of price disclosure at various stages of the divestment process, we study the impact of price disclosure with sell-off announcement by dividing our sample into Price Disclosure and No-Price groups and comparing abnormal returns between these two sub-samples. The impact of price declaration is also similarly assessed within each of the Intention and Completion sub-samples.

The No-Price sub-samples will probably include cases where price is announced after the initial divestment announcement. Klein studied the impact of such subsequent price announcement. However, due to data problems, this study does not investigate this issue and includes only announcements of divestments with price in the Price Disclosure group. As in the Klein (1986) and Hearth and Zaima (1984) studies, the impact of relative size and financial strength on abnormal returns is explored through regression analysis.

Table 3.2 provides a summary of results and methodology of the main studies reviewed earlier. In Chapter 4 we shall specify the hypotheses being tested in this study and the methodology used for testing. This will be followed by results in Chapter 5.

TABLE 3.2- Results of Selected Divestiture (Sell-off) Studies

Study	Methodology	CAR(%)	Event Dates	t-Statistics	Sample Size
Hearth & Zaima (1984)	SIM	3.55	(-5,5)	t=3.14[a]	58
Rosenfeld (1984)	MAR	2.33	(-1,0)	t=4.60[a]	62
Alexander et al (1984)	MAR MKTADJ MKTADJ	0.17 0.40 -0.31	(-1,0) (-1,0) (-1,0)	t=0.6795 t=1.48 t=1.04	53 39*
Jain (1985)	SIM SIM SIM SIM	-0.40 0.70 -0.20 0.09	(-10,-6) (-5,-1) (+1,+5) (0)	t=-2.40[b] t= 4.04[a] t=-1.03 t=1.27	1064 1064 1064 1064
Klein (1986)	SIM	1.12	(-2,0)	t=2.83*	202
Hite et al (1987)	SIM	1.66	(-1,0)	z=4.08*	55
Montgomery et al (1984)	SIM	7.25	-12 Mths +12 Mths	not significant at 5%	78
Denning & Shastri (1990)	MKTADJ	0.014 0.016	(-6,+6) (T-6,T+6)	neither significant at 5%	50
Hirschey & Zaima (1980)	SIM	5.12	(-1, 0)	t=5.12[a]	170
Hirschey et al (1990)	MAR	1.46	(-1, 0)	t=4.36[a]	75
Linn & Rozeff (1984)	MAR	1.45	(-1, 0)	t=5.36[a]	77

Notes:

1- [a,b] denote significance at 1% and 5% levels respectively
* denotes single divestments as compared with multiple divestments.
MAR = mean adjusted returns model; SIM = single index model;
MKTADJ = market adjusted returns model.

2- Event days in brackets are defined relative to the announcement date, t=0, or the completion day. CARs (cumulative average residuals) are those reported in the original research. Not all authors report CARs for (t = -1,0) separately.

Chapter 4 HYPOTHESES AND METHODOLOGY AND DATA

There are a number of competing theories regarding the corporate divestment decision and the wealth consequences for the divestor's shareholders are not in the same direction or of the same magnitude under each scenario. According to the Value Additivity theory, which assumes strong form efficient capital markets, the value of the divested part is the same whether it is a stand-alone business or a subsidiary of another firm. Therefore, the divestment should not lead to any increase in shareholder wealth of the divestor. On the other hand, a divestment may be regarded as a positive NPV decision for a number of plausible reasons.

In general, the firm should not undertake a sell-off unless it is likely to benefit its shareholders. Thus we would expect ceteris paribus a positive change in investors' beliefs about the firm and upward stock price revision on a divestiture announcement. In the divestment context, shareholder value creation may arise from a number of sources. Firstly, it may be that the divested business is worth more to another firm than to its current owners (Jain, 1985; Linn & Rozeff, 1986). Secondly, the sell-off may be of a loss making operation that is generating negative synergy. Its disposal thus eliminates a source of value diminution to the divestor's shareholders. Thirdly, divestment may aim at narrowing the spread of business activities thereby conserving valuable management resource, enhancing managerial productivity and eliminating diseconomies of decision management and management control (Hite, Owers and Rogers, 1987). By abridging the range of activities, the monitoring and control costs in managing a diversified set of operations may be reduced. Finally, the sell-off may have resulted from a carefully thought out strategic redirection of business resources from low to high yielding activities. As such, a sell-off may constitute a "good news" signal

to shareholders about future prospects and investment strategies of the divestor (Rosenfeld, 1984). If any of these arguments hold, divestor shareholders are likely to experience a wealth increment.

Hite, Owers and Rogers (1987) also provide an information argument, derived from the "sitting on a gold mine" hypothesis of Bradley, Desai and Kim (1983) for tender offers ie. that an offer by a third party for part of a firm's assets gives credible evidence for the mispricing of the divesting firm's securities. However, the authors find evidence that supports Bradley et al's alternative synergy hypothesis. Only if control of the assets in question is ultimately transferred to the bidder does a permanent upward revaluation of the divestor's equity occur. Hite et al (1987), in addition, suggest that such disposals may be undertaken to raise cash and reduce high levels of debt. Here asset sales are preferred to the sale of new securities given the adverse market reaction to new equity issues. Mikkelson and Partch (1986), Asquith and Mullins (1986), Masulis and Korwar (1986), and Eckbo (1986), all confirm that stock prices generally react non-positively to the announcement of a new security offering. The general explanation offered relates to differential information between managers and outside investors. Managers have incentives to behave opportunistically and sell new equity when their private information indicates that the stock is over valued. Consequently, rational investors discount the value of the firm when new equity sales are announced (Hite et al, 1987).

The wealth transfer hypothesis (Denning, 1988) posits that within the options model framework, a sell-off, by reducing the amount of asset backing to debtholders in the firm or by increasing the variablility of overall return to the firm, may result in a transfer of wealth from debtholders to stockholders. If such a transfer is engineered by management to favour equity holders, these latter will experience an increase in their

wealth. On the other hand, if as is possible, the sell-off reduces the volatility of the firm's returns, the transfer will be in the other direction and shareholders will experience a wealth decrement. In the case of the "bankruptcy avoidance" motive, a sell-off may be forced on a management as a way of raising enough cash to maintain corporate solvency. Such a distress sale, if unanticipated, may signal "bad news" about the parlous state of the divesting firm's financial condition and the stockmarket will mark down its equity resulting in its shareholders suffering relative impoverishment. On the other hand, a sell-off, even by a financially weak firm whose financial condition is already known, may signify that management is taking decisive action and that the future performance of the firm is likely to be improved. Such a market perception will enhance shareholders' wealth.

The foregoing array of theories of corporate divestment suggest that no ex-ante prediction of the impact on shareholder wealth can be made and that the matter has to be resolved empirically. In the light of the above set of arguments and theories we investigate a number of different specific hypotheses and discuss their implications. As we report in detail in Chapter 3, the extant literature reports not only that the stock market reacts to sell-off announcements but also that the direction and magnitude of this reaction is influenced by a variety of factors concomitant with the divestment process.

4.1 HYPOTHESES

Our first hypothesis concerns the market reaction to sell-offs in the UK and their general impact on shareholder wealth. The following hypotheses explore the impact of contingent factors on such market reaction.

H1: Corporate sell-offs do not lead to any significant change in divesting company shareholder wealth.

Failure to reject this null hypothesis is consistent with the Value Additivity theory. Rejecting the null hypothesis is consistent with any of the other theories described. If there is a significant increase in shareholder wealth we have evidence in support of one or more of the theories presented above which regard divestment as a positive NPV decision. A significant decline in wealth will support the distress sale paradigm or the model that predicts wealth transfer from stockholders to debtholders. All extant studies with the exception of Alexander, Benson and Kampmeyer (1984) and Denning and Shastri (1990) have found statistically significant positive returns accruing to stockholders of divesting firms on announcement day.

The stock market's reaction may be determined by contingent factors which are likely to influence the market's evaluation of i) the degree of uncertainty over the consummation of the divestment and ii) the economic significance of the sell-off to the divestor.

Price disclosure accompanying a sell-off announcement has a dual role. It may lend an air of definitiveness to the sell-off decision thereby mitigating the uncertainty referred to above. However, price disclosure may also have a role beyond mere affirmation of the certainty of sell-off. It permits estimation of the relative size of the sell-off which may indicate the economic significance of the divestment. The information content of relative size may, therefore, be greater than that of mere price disclosure. Moreover, price disclosure may proxy for

relative size if management divulges price only in respect of large sell-offs or the financial press selectively reports only large sell-offs. Our second and third hypotheses relate to these two aspects of price disclosure.

H2: Changes in shareholder wealth are independent of price disclosure at announcement.

This null hypothesis implies that investor reaction to the sell-off announcement is independent of whether the transaction price is disclosed or not. In the context of the signalling hypothesis, it is the divestment announcement per se which constitutes news, good or bad, about future investment strategies (Klein, 1986) or the financial condition of the firm. If the null hypothesis is not rejected no differential market reaction should obtain between samples of sell-off announcements containing price disclosure and those without price disclosure. If the null hypothesis is rejected and larger wealth gains accrue to the former sample than to the latter, we have evidence consistent with a favourable impact of either or both of the two attributes of the price information.

Klein (1986) finds significant differential reaction in the expected direction and suggests that the mixed findings for announcement day excess returns in other studies may relate to whether the price is disclosed as well as the size of divestiture. The same hypothesis is tested on a sub-sample of Intentions and a sub-sample of Completions to gain further insight into the price disclosure impact.

H3 Changes in shareholder wealth are independent of whether the firm announces completion of sell-off or only an intention to divest.

In this case the null position, as with price disclosure, is that it is the sell-off announcement per se that triggers any investor reaction. However, the announcement of mere intention to divest does not alleviate the uncertainty as to **(a)** whether the deal will be subsequently consummated and **(b)** the ultimate price at which the deal will take place, whether or not a price is given initially. Announcement of sale completion, however, mitigates the uncertainty and we would expect the market to react with greater assurance. Therefore, shareholder wealth increase (or decrease) is likely to be of a larger magnitude following the announcement of completion than when only the intention to divest is announced.

Where the announcement of intention is accompanied by price information regarding the sale, this disclosure may further mitigate the uncertainty. Therefore our prior belief is that market reaction to an intention announcement is likely to be greater with price disclosure than when there is no such disclosure. In the context of a completion announcement, however, the role of price disclosure is somewhat more complex. The contribution of price to uncertainty resolution is likely to be minimal since the deal is already done. But a completion announcement without associated price disclosure may diminish the market's ability to appraise the economic significance of the sell-off, potentially leading to an adverse reaction born of dark misgivings about the divestment decision.

The same hypothesis is tested on sub-samples with price declared but with either intention only or completion of divestment announced. Comparison of these two sub-samples allows the assessment of the level of uncertainty associated with the stage of completion of the divestment deal independent of the uncertainty resulting from non-disclosure of price. H3 is also tested on two similar sub-samples with no-price disclosure.

To assess the joint impact of price and completion we compare the sub- samples of Intention No-Price (n = 17) and Completion with Price (n = 73) and test for significant differences in mean abnormal returns. This, we suggest, is the most effective way of assessing the impact of uncertainty since these two sub-samples represent the extremes in the level of certainty about the divestment decision.

H4 Size of divestment relative to size of parent is not related to change in shareholder wealth.

This proposition is a refinement of Hypothesis 2. On the assumption that price disclosure has information content to the market leading to abnormal returns to stockholders on sell-off announcement, the null would posit that the relative size of sell-off is not in itself relevant to the formation of market participant perceptions.

Inability to reject the null hypothesis would be reflected in the lack of significant relationship between magnitude of abnormal return and the ratio of sell-off price to market value of the divestor. If, on the other hand, the degree of association is statistically significant and positive we would again have evidence consistent with theories regarding divestiture as a positive NPV

decision. This is particularly so as in this case the larger the sell-off, the greater the impact on shareholder wealth. If the relationship holds but is in the opposite direction, a more complex argument is suggested. This is that major abridgements in the firm's operating structure are viewed adversely and possibly construed as "a fire sale" under financial distress by market participants who judge small disposals more positively as embodying an orderly and deliberative corporate re-structuring strategy.

Klein (1986) finds relative size of sell-off to be positively correlated with excess return and both Hearth and Zaima (1984) and Klein find their portfolios of large divestitures significantly outperforming their portfolios of small divestitures.

H5 The financial strength of the divestor does not affect market reaction to the announcement of a sell-off.

This null hypothesis relates to the "bankruptcy avoidance" motive, ie that the sell-off may be forced on the firm's unwilling management to raise cash in an attempt to ensure survival, thereby constituting a distress sale. If there is no evidence of differencial market reaction to divestments by financially healthy and financially distressed firms then we have no evidence in support of this hypothesis.

If, on the other hand, the null hypothesis is rejected and sell-offs by financially weak firms lead to greater increase in shareholder wealth than those by financially strong enterprises, we would have positive evidence to support the bankruptcy avoidance proposition. This is on the basis that the ailing firm is

likely to be worth more to shareholders as a going concern than bankrupt. An alternative, although related argument, is information related in that the sell-off may be taken as signalling that the company's management is taking strong action to improve firm performance. On the other hand, the null hypothesis would be rejected equally if divestments by financially weak firms generated shareholder wealth losses. In this case, such sell-offs would be viewed by the market as negative NPV decisions and we would have evidence consistent with the "harbinger of doom" or "fire sale" interpretations of the sell-offs.

If, however, corporate disposals by strong firms earn greater abnormal returns to stockholders than those by financially weak enterprises, we would have evidence consistent variously with the idea that a strong firm can shop around and obtain a better price for its assets (Hearth and Zaima, 1984).

These confounding implications of divestor financial strength have not been explored in the literature to date. Hearth and Zaima (1984) split their sample of divesting firms into two of almost equal size on the basis of Standard and Poor's common stock rankings used to measure financial status. They find that their sample of good financial status firms exhibit greater cumulative abnormal returns associated with a sell-off than do their sample of poor financial status enterprises. Hearth and Zaima use these results to argue that strong firms are in a better position to obtain good prices for their assets than weaker firms. Sicherman and Pettway (1987) explore the relationship between the worsening of the financial condition of the divestor, and a consequent potential weakening in its negotiating position, and the gains earned by the acquiring firm and employ downgrading by Moody's and/or Standard and

Poor's within two years of a divestiture announcement as a measure of financial weakness. However, the authors find no significant evidence to support their argument.

Rosenfeld (1984) attempts to control the financial condition of his two samples of sell-off and spin-off firms by categorising them into three classes, again using Standard and Poor's common stock ratings. Companies in each sample are classified as high, medium and low quality on the basis of S & P ratings one year after announcement month. Rosenfeld's results are somewhat mixed with no clear picture emerging as regards his sell-off sample although spin-offs by high quality firms appear to earn substantially greater returns for shareholders than do those by medium and low quality ranked enterprises. He concludes that because S & P rating is an imperfect proxy for financial condition, "...additional testing using alternative surrogates seems necessary before definitive conclusions can be drawn."

In this thesis we focus explicitly on the bankruptcy avoidance motive and compute z-scores (Altman, 1968; Taffler, 1983) for the firms in our sample, to measure their bankruptcy risk directly.

4.2 MARKET EFFICIENCY AND MODELS FOR MEASURING ABNORMAL RETURNS

4.2.1 MARKET EFFICIENCY

The event study methodology in this research is based on a set of assumptions regarding the behaviour of the stock market. We assume that

markets are "efficient". A definition of an efficient market appeared in Fama (1970): "It is a market in which prices always 'fully reflect' available information".

The Efficient Market Hypothesis (EMH) states that "new information is widely, quickly, and cheaply available to investors, that this information includes what is knowable and relevant for judging securities, and that it is very rapidly reflected in the security price", (Fama, 1970). Some investors may out perform the market sometimes but if the EMH holds, such superior performance cannot be consistently maintained. In an efficient market, as each new piece of information becomes publicly available and is analysed, there is the possibility of rapid changes in equilibrium as the new information becomes reflected in market prices. These equilibrium prices will then hold until the next bit of information becomes available. It is the speed with which new, relevant information is reflected in share prices which makes a market informationaly efficient.

Fama (1970) suggests three levels of market efficiency; the weak, the semi-strong and the strong form:

a) **Weak form efficiency:** The information sub-set is past prices or returns. This form states that the information contained in past share price data is fully reflected in current prices. Returns in excess of the market average cannot be earned from a study of historical share price patterns or financial ratios.

b) **Semi-strong form efficiency:** The information sub-set is publicly available information. Such information is speedily reflected in share prices. Current prices, therefore, fully reflect all public information about the company and excess returns cannot be made unless the investor has inside information.

c) **Strong form efficiency:** The information sub-set is all information whether publicly available or not. The strong form states that share prices not only reflect what is publicly known but also what is knowable. This form implies that because of the activities of analysts and others involved in the stock market, even before investors with inside information can trade based on the information they possess, share prices will have adjusted so that no substantial profit can be made from such information. Excess returns cannot consistently be made by investors who have inside or monopolistic information.

The following conditions for market efficiency are noted:

1) There are no transaction costs in trading securities.
2) All information is costlessly available to market participants.
3) All participants agree on the implications of current information for the current price and distribution of future prices of each security.

The above assumptions are sufficient for market efficiency. It is obvious, however, that a model based on these assumptions is a simplification of real capital markets. For example, investors do incur transaction costs. A weaker and economically more plausible version of the efficiency hypothesis says that prices reflect information to the point where the marginal benefits of acting on information (the profit to be made) do not exceed the marginal costs (Jensen, 1978). Fama (1991) suggests that due to information and trading costs the extreme

version of market efficiency is surely false. It provides, however, a clean bench mark for laying out the evidence on the adjustment of prices to various kinds of information. One can then investigate and judge scenarios where market efficiency is a good approximation.

Empirical studies generally use the Capital Asset Pricing Model (CAPM) as a tool for analysing captital market efficiency. However CAPM and Capital Market Efficiency are joint and inseparable hypotheses. Therefore any test of market efficiencey that uses the CAPM to adjust for risk is a joint test of the CAPM which assumes market efficiency for its derivation and of market efficiency itself. Various sophisticated empirical tests of the CAPM (e.g:- Black, Jensen, and Scholes, 1972; Black and Scholes, 1974; and Fama and MacBeth, 1973) show that the CAPM fits reality surprisingly well. However, because the theoretical CAPM assumes market efficiency, any empirical results which show that on the average there are no significant deviations from the model are merely consistent with market efficiency.

A number of writers have raised doubts about the validity of the EMH. The Dyckman, Downes and Magee (1975) and Lev and Ohlson (1982) reviews of the empirical evidence on informational market efficiency contain many studies which question the EMH. However most major research has come down in support of the semi-strong form which implies acceptance of the weak-form. However, certain evidence is inconsistent with the strong form of efficiency assumption. There are cases where individuals with inside information appear to be able to earn abnormal returns both when selling and when buying (Jaffe, 1974; Finnerty, 1976). Block traders also seem able to earn abnormal returns when they trade at the block price as can purchasers of new equity issues (Scholes,

1972; Kraus and Stoll, 1972; Dann, Meyers, and Raab, 1977). There are, also, irregularities in the stock price behaviour that can affect the measurement of abnormal returns in testing market efficiency.

Security analysts provide a great deal of expertise about tax law and portfolio diversification techniques. For these and other reasons, one can argue that there is nothing inconsistent with the notion of capital market efficiency and the existence of arbitrageurs and security analysis (Copeland and Weston, 1980, p.211).

Tests of market efficiency and their conclusions can be summarised in the following form:

a) Market efficiency in its weak form is rejected by recent research that is able to show that daily and weekly returns may be predictable to a degree from past returns, (Fama, 1991 p.1580).

b) Market efficiency in its semi-strong form can be tested through event studies, where market reaction to a public announcement is measured. The typical result in event studies on daily data is that, on average, stock prices seem to adjust within a day to event announcements. Such quick reaction is consistent with efficiency (Fama 1991, p.1602).

c) Tests of market efficiency in its strong form aim to test whether any investors have private information that is not fully reflected in market prices. Early work (e.g. Jaffe, 1974) suggests that insiders may have information that is not reflected in prices, and that the market may not react quickly to public information about

insider trading, leading to the conclusion that the stock market may not be efficient. Seyhun (1986), however, confirms that, whereas insiders profit from their trades, there is no evidence that outsiders can profit from public information about insider trading.

One way of testing for the availability of private information is to test the performance of investment managers. Unlike event studies, evaluating the access of investment managers to private information involves measuring abnormal returns over long periods. Such tests thus run into the joint-hypothesis problem: measured abnormal returns can result from market inefficiency, a bad model of market equilibrium, or problems in the way the model is implemented. For instance, Ippolito (1989), using single-factor bench marks derived from the Sharpe-Lintner model, finds that mutual fund managers have private information that generates abnormal returns. In contrast, using 2- and 3-portfolio benchmarks that are consistent with mutifactor asset-pricing models, Elton, Gruber, Das and Hklarka (1991) and Brinson, Hood and Beebower (1986) find that mutual funds on average have negative abnormal returns.

4.2.2 MARKET ANOMALIES

The Sharpe-Linter-Black (SLB) model predicts that market β suffice to describe a security's expected returns. Basu (1977, 1983) shows that earnings/price ratios (E/P) can explain some of the expected return in shares. In his studies, after controlling for β, the expected returns are positively related to E/P. Banz (1981) shows that a firm's size (price times shares) helps explain expected returns. Given their market βs, expected returns on small stocks are too high, and expected returns on large stocks are too low. Bhandari (1988) shows that leverage is positively related to expected stock returns in tests that also

include market betas. Chan, Hamao and Lakinoshok (1991) and Fama and French (1992) find that book-to-market value of equity (the ratio of the book value of the net assets of a firm to its market value) has strong explanatory power; controlling for β, higher book-to-market ratios are associated with higher expected returns.

Many seasonal patterns in returns have been observed and are referred to as anomalies in the sense that asset-pricing models do not predict them. There are a number of examples. Monday returns are on average lower than returns on other days (Cross, 1973; French, 1980 and Gibbons and Hess, 1981). Returns are on average higher on the day before a holiday (Ariel, 1990), and the last day of the month (Ariel, 1987). In January, the stock returns, especially returns on small stocks, are on average higher than in other months. Moreover, much of the higher January return on small stocks comes on the last day in December and the first 5 trading days in January (Keim, 1983; Roll, 1983). Dimson (1988) reports various forms of "anomalies" and Keim (1988) reviews this literature.

Chan and Chen (1991) argue that the size effect is due to a distorted-firm factor in returns and expected returns. When size is defined by the market value of equity, small stocks include many marginal or depressed firms whose performance (and survival) is sensitive to business conditions. Chan and Chen argue that relative distress is an added risk factor in returns, not captured by market beta, that is priced in expected returns. Fama and French (1991) argue that since leverage and book-to-market equity are also largely driven by the market value of equity, they also may proxy for risk factors in returns that are related to relative distress or, more generally, to market judgements about the relative prospects of firms. Chan, Hamao, and Lakonishok (1991) and Fama and French (1991) find that size and book-to-market equity are related. Fama and French

(1991) find that leverage and book-to-market equity are highly correlated. Given that the common driving variable in E/P, leverage, size and book-to-market equity is a stock's price, it is hardly surprising that these links among anomalies exist.

Levis (1989) studies the interdependency between size, dividend yield, PE ratio and share price effect as share price is the common element between them. The reason for such analysis is to see whether such anomalies are independent of or related to market size. Reinganum (1981) and Banz and Breen (1986) argue that the size effect subsumes the PE effect. Basu (1983) suggest the opposite, that size related anomalies disappear when one controls for the PE effect. Cook and Rozeff (1984) and Jaffe, Keim and Westerfield (1988) conclude that both PE and size effect are at work.

There is also evidence of a significant positive relationship between dividend yields and returns (e.g. Litzenberger and Ramaswamy, 1979; Blume, 1980; Gordon and Bradford, 1980; Miller and Scholes, 1982; and Elton, Gruber and Rentzler, 1983). Some authors attribute this relationship to disparity in the tax rates for dividend yields and capital gains, others maintain that yield related effects are due to information bias. Keim (1985) suggests that the positive dividend yield-return relation is a direct result of concentration of smaller firms in certain high dividend yield categories. Levis (1989) concludes that the London Stock Exchange exhibits a number of irregularities in stock price behaviour and that investment strategies based on dividend yields, PE multiples and share prices seem to be at least as profitable, if not more so, as strategies based on market size. Furthermore, the size effect is not entirely independent of

the other three irregularities. The significant market size effect, for example, is markedly reduced when control over differences in dividend yield is exercised. Size effect is further addressed in Section 4.8. below.

4.2.3 MARKET EFFICIENCY & EQUILIBRIUM MODELS

As explained earlier, event studies are a joint test of market efficiency and model employed. Under semi-strong form efficiency we expect new information to be speedily reflected in share prices. In this study, nevertheless, to allow for the possibility that no single model may be fully descriptive of the return generating equilibrium process, we conduct our tests of abnormal returns with different model specifications.

The use of several return generating models, however, does not solve the joint-hypothesis problem. Every test within our event study is conditional upon the joint-hypothesis of the validity of a particular model employed and market efficiency. Because of the joint-hypothesis problem, precise inferences about the degree of market efficiency are likely to remain impossible (Fama 1991, p.1576). Subject to such a limitation, our event study would test the market reactions to firm specific information.

Nevertheless, Fama (1991) states that the clearest evidence on market-efficiency comes from event studies on daily returns as they give a clear picture of the speed of adjustment of prices to information. The results indicate that prices adjust quickly to information about investment decisions, dividend changes, changes in capital structure and corporate control transations. The evidence tilts towards the conclusion that prices adjust efficiently to firm-specific information Fama (1991, p.1607).

4.3 MODELS FOR MEASURING ABNORMAL RETURNS

In order to measure the abnormal return performance of a security it is necessary to specify what the normal return is. The normal return may be defined to be the equilibrium return that is expected from a security in response to changes in the stock market return in the absence of a specific event. This assumed relationship between security return and market return is used to predict future returns.

In every model employed in the present study the abnormal return for a given security is defined as the difference between its actual ex post return and that which is predicted by the equilibrium return generating model. That is, for security *i* at time *t*:

$$AR_{it} = R_{it} - E(\tilde{R}_{it}) \tag{4.1}$$

where,

R_{it} = actual return,

$\tilde{R}_{it}$= the return which will be realised on security i in period t,

AR_{it} = abnormal return and,

$E(\tilde{R}_{it})$ = the expected value of return $\tilde{R}_{it}$

The notations used in Sections 4.3 and 4.4 are in line with Brown and Warner (1980 and 1985).

4.3.1 MARKET ADJUSTED RETURN

This model assumes that all securities move with the market at the same rate. The model thus assumes that ex-ante expected returns are equal across all

securities. Since the market portfolio of risky assets M is a linear combination of all securities, based on our assumption in this model for any given security *i* and day *t*, the expected return is the same as the expected return for the market, that is:

$$E(\tilde{R}_{it}) = E(\tilde{R}_{mt}) = K_t \qquad (4.2)$$

where, R_{mt} = return on the market index and K_t = bench mark return for security i on day *t*.

The ex post abnormal return on any security *i* is given by the difference between its return and that on the market portfolio. Using the same notation as previously, the following formula has been used in this study for calculating abnormal returns under the Market Adjusted Model:

$$AR_{it} = R_{it} - R_{mt} \qquad (4.3)$$

The Market Adjusted Return Model is also consistent with the Capital Asset Pricing Model (see next section) if all securities have systematic risk of unity (Brown and Warner, 1980, p208).

4.3.2 OLS MARKET MODEL

This approach is based on finding the parameters α_i and β_i by regression of each security using the following single index model:

$$E(\tilde{R}_{it}) = \alpha_i + \beta_i \tilde{R}_{mt} + \varepsilon_{it} \quad (4.4)$$

where,

α_i and β_i =OLS slope coefficient for security *i*

ε_{it} = error term in estimation.

Under this model the abnormal return is calculated as:

$$\varepsilon_{it} = AR_{it} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt} \quad (4.5)$$

Where $\hat{\alpha}_i$ and $\hat{\beta}_i$ are OLS values from the estimation period. This model is one of the most widely used in event studies as it is a variant of the Capital Asset Pricing Model,(CAPM) discussed in the next section.

In an efficient market and in the absence of an event, the expected values of the unexpected component,$\tilde{\varepsilon}_{it}$, of a security's return cannot systematically differ from zero. Therefore ε_{it} would be equal to the abnormal return for security *i* at time *t*.

4.3.3 MARKET AND RISK ADJUSTED RETURN MODEL

The capital asset pricing model (CAPM) is a return generating model which adjusts security returns for both market movements and market related risk. This economic model was developed almost simultaneously by Sharpe (1963, 1964) and Treynor (1961), while Mossin (1966), Linter (1965, 1969) and Black (1972) developed it further. The CAPM makes the following assumptions about investors and their opportunity set (Copeland and Weston, 1988, p194):

1. Investors are risk-averse individuals who seek to maximise the expected utility of their end-of-period wealth.
2. Investors are price takers and have homogeneous expectations about asset

returns which have a joint normal distribution.

3. There exists a risk-free asset such that investors may borrow or lend unlimited amounts at the risk-free rate.

4. The quantities of assets are fixed. Also, all assets are marketable and perfectly divisible.

5. Markets are frictionless and information is costless and simultaneouly available to all investors.

6. There are no market imperfections such as taxes, regulations or restrictions on short selling.

In the CAPM, for every security i :

$$E(\tilde{R}_{it}) = E(\tilde{R}_{ft}) + \beta_i[E(\tilde{R}_{mt}) - E(\tilde{R}_{ft})] \tag{4.6}$$

where, R_{ft} is the risk free return (Copeland and Weston, 1979, p179). In this formulation the abnormal return is calculated as:

$$AR_i = R_{it} - [R_{ft}(1-\beta_i) + \beta_i R_{mt}] \tag{4.7}$$

4.3.4 MEAN ADJUSTED RETURN

The Mean Adjusted Returns (MAR) Model assumes that the ex-ante expected return for a security is a constant K. That is for each security i:

$$E(\tilde{R}_{it}) = K_i \tag{4.8}$$

K_i is calculated by taking a simple arithmetic average of returns on security i during the estimation period. The abnormal return once again would be the difference between the actual observed return R_{it} and the average of returns for the estimation period, that is:

$$AR_{it} = R_{it} - K_i \tag{4.9}$$

This model is consistent with the Capital Asset Pricing Model; under the assumption that a security has constant systematic risk and that the efficient frontier is stationary, the Asset Pricing Model also predicts that a securities expected return is expected to be constant, (Brown and Warner 1980, p208). The Mean Adjusted Return model is simple to use as there is no need for calculating individual security βs and adjusting for thin trading (see Section 4.7 below).

4.3.5 COMPARISON BETWEEN MODELS

The MAR model, being simple and consistent with the CAPM, has been used in various divestment studies such as Alexander et al (1984), Miles et al (1983) and Rosenfeld (1984). This model can produce results compatible with and even in some cases more accurate than more complicated models. The reason is that although by defining the relationship between the security and the market, in theory, we enhance the accuracy of the prediction model, such refined models depend on estimations of parameters that in practice cannot be measured accurately thus reducing the overall accuracy of such models. For instance, in handling daily share price data one observes (a) non-normality of returns and excess returns, (b) bias in OLS estimates of market model parameters in the presence of non-sychronous trading and (c) long period of absence of trading, particularly in small stocks.

There are several ways of measuring abnormal returns under different variants of the CAPM. These include OLS market model residuals, Fama-MacBeth (1973) residuals and control portfolios. The difference in the predictive ability of these methods can be substantial, (Brown and Warner 1980, p.210).

In this study our data was separately analysed using the Market Adjusted model, OLS - Market model and the CAPM. The Mean Adjusted Return model is not used due to the fact that the data for this study is for the period 1985 - 1986 when the market was generally rising. This systematic rise within the market introduces upward bias (Denning, 1987). Brown & Warner (1980) also find, using monthly data, that when event dates are randomly selected but clustered in calendar time, the Mean Adjusted method performed very poorly compared to those methods which explicitly adjusted for market performance. Brown and Warner (1985, p.267) also demonstrate, using daily data, that the Market Adjusted Returns and the OLS Market models also outperform a simpler Mean Adjusted Returns procedure, which has low power in cases involving event-date clustering.

4.4 TESTS OF SIGNIFICANCE OF ABNORMAL RETURNS - DEPENDENCE ASSUMPTION

As a consequence of non-synchronous trading, as explained in later sections of this chapter, daily excess returns can exhibit serial dependence. There may also be cross-sectional dependence of the security-specific excess returns if there are common influences on excess returns e.g. industry influence. By using a time-series of average excess returns (ie. 'portfolio' excess returns), the test statistic presented here takes into account cross-sectional dependence in the security-specific returns. However, it ignores serial-dependence. Brown and Warner (1985, p.19) do not find benefits from adjusting for serial-dependence. The test statistic presented in this section is referred to as the dependence t-test in contrast to the independence t-test, where cross-sectional independence is assumed (see Section 4.4.1 below). The dependence t-test is used throughout the analysis in this study.

The t-statistics used in this study are based on the Brown & Warner (1985) methodology. The test statistic is the ratio of the event day mean abnormal return to its standard deviation. The standard deviation is estimated from the time-series of mean abnormal returns. The test statistic for any event day T is

$$\frac{\overline{AR_t}}{\hat{S}(\overline{AR_t})} \tag{4.10}$$

where,

$$\overline{AR_t} = \frac{1}{N_t} \sum_{i=1}^{N_t} AR_{i,t} \tag{4.11}$$

$$\hat{S}(\overline{AR_t}) = \sqrt{\frac{\sum_{t=-180}^{t=-41} (\overline{AR_t} - \overline{\overline{A}})^2}{139}} \tag{4.12}$$

$$\overline{\overline{A}} = \frac{1}{140} \sum_{-180}^{-41} \overline{AR_t} \tag{4.13}$$

Where,

N_t = number of sample securities and

$\hat{S}(\overline{AR_t})$ = standard deviation of the daily average abnormal return.

If the daily average abnormal returns $(\overline{AR_t})$ are independent, identically distributed, and normal, the test statistic is distributed Student-t with 139 degrees of freedom under the null hypothesis. For measuring the statistical significance of abnormal returns over a range of days surrounding the sell-off event the cumulative average abnormal returns over the range needs to be calculated. The cumulative average abnormal return metric *(CAR)* for M days from day b to day e (beginning to end of observation period) is given by:

$$CAR_{b,e} = \sum_{t=b}^{e} AR_t \tag{4.14}$$

where $M_{b,e}$ is the number of days from day b to day e:

$$M_{b,e} = e - b + 1 \tag{4.15}$$

The test statistic for significance of *CAR* is the ratio of that return to its estimated standard deviation with 139 degrees of freedom (Jain 1985, p.215):

$$t_{be} = \frac{CAR}{\hat{S}(\overline{AR_t})\sqrt{M_{be}}} \tag{4.16}$$

Given the high degrees of freedom the test statistics may be assumed unit normal in the absence of abnormal performance (Brown and Warner 1985, p.8 and 29).

4.4.1 CHANGES IN βS

Divestiture changes the expected cash flow of a company. There is therefore a possibility that the risk coefficient β, in the market model and the CAPM for the company might change. Such a change would make the βs calculated during the estimation period a biased measure of risk when applied by the observation period. Larcker, et al (1980) explore the possibility of shift in βs during the event period. Klein (1986) finds no statistically significant shift in βs following announcement of divestiture.

Klein (1986) separately fitted the market model to her data using a post-announcement period (+50 , +150) to find the model parameters for each

company. The βs obtained from the post-announcement estimation period were found not to be significantly different from those obtained from the pre-announcement estimation period.

4.4.2 TEST STATISTICS UNDER THE INDEPENDENCE ASSUMPTION

Abnormal returns observed for each security may be independent of one another once the marketwide effects have been factored out as in the CAPM. If so, the t-statistic is calculated differently as shown below.

Under the independence assumption the abnormal return AR_{it} of each security i is divided by its estimated standard deviation to yield a standardised abnormal return, (Brown and Warner, 1985, p.28), that is:

$$AR'_{i,t} = \frac{AR_{i,t}}{\hat{S}(AR_{i,t})} \tag{4.17}$$

where,

$$\hat{S}(AR_{i,t}) = \sqrt{\frac{\sum_{t=-180}^{t=-41} (AR_{i,t} - AR_i^*)^2}{139}} \tag{4.18}$$

$$AR_i^* = \frac{1}{140} \sum_{t=-180}^{-41} AR_{i,t} \tag{4.19}$$

Average standardised residual (*ASR*) for day t and cumulative average standardised residuals (*CASR*) over the period b to e are calculated as below:

$$ASR_t = \frac{1}{N_t} \sum_{i=1}^{N_t} AR'_{i,t} \tag{4.20}$$

$$CASR_{b,e} = \sum_{t=b}^{e} ASR_t \tag{4.21}$$

where,

N_t = number of sample securities at day t

b,e= beginning and end of the cumulation period relative to the event day t=0

ASR_t= average standardised residual for day t.

Then following Brown and Warner (1985) the t statistics to test for the significance of ASR_t and $CASR_{b,e}$ are calculated as follows:

$$Z_{ASR} = \sqrt{N_t}\, ASR_t \tag{4.22}$$

$$Z_{CASR} = \sqrt{\frac{N_t}{M_{b,e}}}.CASR_{b,e} \tag{4.23}$$

where $M_{b,e}$= e-b+1 days.

If the standardised excess returns are independent and identically distributed with finite variance, in the absence of abnormal performance, the test statistic will be distributed unit normal for large N_t (Brown and Warner,1985, p.28; Tehranian et al, 1987, pp.937-8).

4.5 T-TEST FOR DIFFERENCE BETWEEN TWO MEANS (DEPENDENCE ASSUMPTION)

Based on methodology used by Sicherman and Pettway (1987, footnote 4), and Miles and Rosenfeld (1983), the t-test for significance of difference in the means of two sub-samples *i* and *j* modified for equal cumulative interval, $M_{b,e}$,is given by

$$t_{i,j} = \frac{CAR_i - CAR_j}{M_{b,e}^{\frac{1}{2}}(S(AR_i)^2 + S(AR_j)^2)^{\frac{1}{2}}} \tag{4.24}$$

where,

CAR_i , CAR_j = Cumulative abnormal return for sub-sample *i* and sub-sample *j*

$M_{b,e}$= Time period over which the daily abnormal returns of the two samples are cumulated.

$S(AR_i)$= Standard deviation of daily abnormal return for sub-sample *i*

$S(AR_j)$= Standard deviation of daily abnormal return for sub-sample *j*

The degrees of freedom under this methodology are equal to $(T_i + T_j - 2)$, where T*i* and T*j* are the number of days in the estimation periods of each of sub-samples. For this study the degrees of freedom would be 140 + 140 - 2 =278. This test is appropriate under the assumption that we are dealing with independent random samples from two normal populations having the same unknown variance, (see Miles and Rosenfeld, 1983, p.1603).

4.6 PROPERTIES OF DAILY DATA

The first divestment study, that of Boudreaux (1975), made use of monthly data. Subsequent studies have used daily share price data with obvious benefits in enhanced accuracy in terms of measuring the impact of the divestiture announcement on a daily rather than monthly basis. The use of daily data in an event study, however, introduces certain problems.

a) **Non-Normality:** In the case of daily stock returns, an individual security exhibits a substantial departure from normality (Fama, 1976, p.21).

If the cross-sectional excess security returns are independent and identically distributed drawings from finite variance distributions, the distribution of the sample mean excess return converges to normality as the number of securities increases - this is guaranteed under The Central Limit Theorem (Billingsley

1979, pp.308-319). Blattberg and Gonedes (1974) and Hagerman (1978) provide some evidence that the distribution of the cross-sectional daily mean return converges to a normal distribution.

Nevertheless Brown & Warner (1985) find that the non-normality of daily returns has no obvious impact on event study methodology. Although daily excess returns, for an individual security, are also highly non-normal, evidence suggests that the mean excess return in a cross-section of securities converges to normality as the number of sample securities increases.

b) **Non-synchronous trading and estimation of the parameters of the market model:**

Not all securities are traded every day. When the trading interval for a security is more than one day, any estimation of the regression between market return and security return is distorted by the fact that the market returns are calculated over one day intervals and the returns of a thinly traded stock are calculated over a period longer than one day. Therefore, the return on a security and the return on the market index are each measured over different trading intervals and this causes ordinary least square (OLS) estimates of market model parameters to be biased and inconsistent. Such bias is less noticeable in monthly data than daily data. Treatment of daily data to account for non-synchronous trading is discussed by Scholes and Williams (1977, p.324) and Dimson (1979, p.197). In the present study both treatments are applied and comparisons made.

c) **Variance estimation:**

The estimation of the variance of sample mean excess return is important for tests of statistical significance for both daily and monthly data. Several problems need to be addressed:

i) As a consequence of non-synchronous trading, excess returns can exhibit serial dependence. Attempts have been made to incorporate such serial dependence in excess returns into variance estimates in event studies (see Ruback, 1982) and its implications for event studies are examined by Brown and Warner (1985). There are also other time-series properties, such as day of the week or week-end effects (see French, 1980 and Gibbons and Hess, 1981). When non-synchronous trading is present, for hypothesis tests over intervals of more than a day, the failure to take into account autocorrelation in estimating the variance of the cumulative mean excess return could result in model misspecification. However, autocorrelation seems to play a minor role and benefits from autocorrelation adjustmenets appear to be limited (Brown and Warner, 1985, pp.19-20). Interestingly neither the Scholes - Williams nor the Dimson procedures purge autocorrelation from the excess return measure.

ii) Cross-sectional dependence of specific security returns can also exist. There are advantages in adjusting for cross-sectional dependence (see Brown and Warner, 1980; Beaver, 1981; Dent and Collins, 1981). There are also costs in adjusting for dependence when none is present. If there is positive cross-sectional dependence, failure to make such an adjustment results in a systematic under-estimation of the variance of the mean excess return. This causes too many rejections of the null hypothesis. Brown and Warner (1985) find that ignoring low levels of dependence, as in the studies where event dates are not clustered, introduces little bias in variance estimates.

Explicit use of the independence assumption can increase the efficiency of the variance estimator. By permitting more precise estimation of the variance used in the test statistic, the independence assumption can make it easier to detect abnormal performance when it is present (Brown and Warner, 1985, pp.20-21).

iii) There is evidence that the variance of stock returns increases for the days immediately around events such as earning announcements (Beaver, 1968; Patell and Wolfson, 1979; and Kalay and Lowenstein, 1983). Christie (1983) suggests that the variance in daily returns in some studies could increase by a factor of almost two around event days. This might lead to too many rejections of the null hypothesis. Brown and Warner (1985) using a simulation approach show that doubling the variance results in a rejection under the null hypothesis of 12% of cases, almost three times the figure of 4.4% obtained with no variance increase.

4.7 TREATMENT OF THIN TRADING

There are several methods of treating the thin trading problem and arriving at an estimate of β when a security is infrequently traded. Among these we select Scholes and Williams (1977) and Dimson (1979) methods for treatment of thin trading in this study. These methods are explained below.

4.7.1 SCHOLES - WILLIAMS METHOD.

This method requires a record of whether and, not when, a share was traded within a time period. The return is calculated and used only if a transaction is known to have occurred in consecutive time periods. The market index is defined

to be the mean of all such returns. Using the simple market model regression, such a definition of the market index overstates the βs of shares that are as frequently traded as the market. On the other hand the shares that are infrequently or very frequently traded tend to have their risk underestimated. β is calculated by regressing the market model with either a synchronous, a lagged or a lead market return.

$$\hat{R}_t = \hat{\alpha} + \sum_{k=-1}^{1} \hat{\beta}_k \hat{R}_{m,t+k} + \varepsilon \qquad , \qquad k = -1, 0, 1 \tag{4.25}$$

where,

$\hat{R}_t$ = estimated return at time t

$\hat{R}_{m,t+k}$ = estimated market return at time $t+k$

$\hat{\alpha}$ and $\hat{\beta}_k$ are the OLS values from the estimation period for any of the firms. The unbiased estimator is given by the sum of the slope coefficients, divided by one plus twice the autocorrelation coefficient, ρ, of the index. That is:

$$\hat{\beta} = \frac{\sum_{k=-1}^{1} \hat{\beta}_k}{(1+2\rho)} \tag{4.26}$$

The Scholes and Williams (1977) method was utilised in obtaining a set of alphas and βs used in estimation of abnormal returns in this study.

4.7.2 DIMSON METHOD (1979)

Also known as the Aggregate Coefficient (AC) method, this consists of a multiple regression of observed returns on preceding, synchronous and subsequent market returns and then adding all the slope coefficients to obtain an overall β for the security, that is, where:

$$\hat{R}_t = \hat{\alpha} + \sum_{k=-n}^{n} \hat{\beta}_k \hat{R}_{m,t+k} + \varepsilon_t \qquad (4.27)$$

$$\hat{\beta} = \sum_{k=-n}^{n} \hat{\beta}_k \qquad (4.28)$$

where,

$\hat{R}_t$ = estimated security return on day t.

$\hat{\alpha}$ and $\hat{\beta}_k$ = estimated slope coefficient.

β_k = β of a regression on day k ($k = -n$ to $+n$).

$\hat{R}_{m,t}$ = is estimated market return at time t.

$\hat{\beta}$ = overall β for a security.

n = number of lead and lag terms incorporated in the regression.

A combination of lags and leads is used to derive the Dimson adjusted βs. Lag terms generally seem to carry more weight in such multiple regressions. In this study a combination of 5 lags and 2 leads is used. Whereas one would expect the average βs of a large number of companies to equal 1, ie be representative of the market, it is observed that the arithmetic average of such βs is less than one. Five lag and two lead terms produced the highest average β of 0.92. This was higher than the average βs of 0.76 obtained from the Scholes and Williams method. Comparison of various β estimates is made in Chapter 6. Fowler & Rorke (1983) suggest a correction to the AC method to equate it to the Scholes and Williams estimator. Although this adjustment was not adopted here, the derived Dimson betas appear to suffer considerably less from downward bias than the Scholes and Williams betas, suggesting such an adjustment may be unnecessary.

4.8 SIZE EFFECT

Dimson and Marsh (1986) demonstrate that abnormal returns are distorted when:

a) the measurement interval, that is the observation period for the event, is long,

b) firms used in the event studies differ in size from the index constituents,

c) the size effect is large and/or volatile.

They discover that the likelihood of such biases is greater with CAPM-type methodologies such as the models of Sharpe (1964), Linter (1965), Black's (1972) two factor model as well as the Banz (1981) arbitrage portfolio model than it is with the Single Index Market Model. Dimson and Marsh (1986) suggest that to measure βs without bias, security returns should be regressed not on the market index but on a portfolio of firms of similar size. Due to unavailability of such data for UK firms, our methodology has not included treatment for size effect.

Levis (1989) demonstrates that the size effect is not consistent across all dividend, PE or share price quintiles. Furthermore, it is hard to distinguish between size and share price effect - share price being the common factor between size, dividend yield and PE ratio. It is found that size effect is significantly reduced when control over the differences in dividend yield is exercised. (See section 4.2.2).

According to Dimson and Marsh (1986) even when bias is present, its magnitude will depend on the length of the observation period. Over very short periods such as days or even months immediately following an event, bias from benchmark

misspecification is likely to be small. As the observation period is extended, however, the bias will be magnified, so that over longer periods, it becomes dominant and assumes (apparently) economically significant proportions.

In our study although abnormal returns over various long intervals are also reported, we test our hypotheses using relatively short time periods (only 1 to 3 days) that is (-2 to 0). The bias in estimated abnormal returns is thus reduced and is not expected to affect the general direction of the results reported.

4.9 Z-SCORE

Financial status of the divestor is measured by the generic z-score "bankruptcy model" approach (Altman 1968; Taffler 1984). The z-score model measures a firm's insolvency potential based on its degree of similarity with samples of previously failed and solvent firms using financial ratio data. If a company has a negative z-score, it is at acute risk of financial distress. However, if the company has a positive value it is not at risk (Taffler, 1983).

Two models are used, both developed using discriminant analysis techniques and of the form,

$$z = c_0 + c_1x_1 + c_2x_2 + c_3x_3 + \cdots + c_nx_n \qquad (4.29)$$

where, $x_1 \ldots x_n$ are financial ratios and $c_1,\ldots..c_n$ coefficients and c_0 is a constant. The first model is for analysing industrial companies with the following ratios: profit before tax/current liabilities, current assets/total liabilities, current liabilities/total assets and no-credit interval. The second model, for the analysis of the wholesale and retail sectors etc., has ratios: cash flow/total liabilities, debt/quick assets, current liabilities/total assets and no-credit interval. Taffler (1984) reports the performance

of the two models in practice and their true ex ante predictive ability. His results suggest the use of a negative z-score as an accurate measure of bankruptcy risk potential.

4.10 DATA PREPARATION

4.10.1 SOURCE OF DIVESTOR INFORMATION

Names of divestors and the information on divested parts along with the declared price, if any, were obtained from the Acquisitions Monthly. The information in Acquisitions Monthly is obtained in the majority of cases from the press such as the Financial Times or the Daily Telegraph. In some cases Acquisitions Monthly also receives press releases direct from parent companies. Therefore, the announcement day reported is, in the great majority of cases, is the press day, defined as day '0' and the actual day of announcement to the market is likely to be day-1. However, if information is released after trading hours but is published in the press the next day, the actual announcement will be day '0'. Similar considerations also apply to completion announcements.

4.10.2 PERIOD OF STUDY

The study covers divestments announced during January 1985 through to December 1986.

4.10.3 METHOD OF SAMPLING

Observation period surrounding the divestment event has been taken as -40 to 40 days centered on the event day. With this requirement the following criteria have been used for screening the data:

1) Where prices were declared only divestments valued at higher than £250,000 are selected. The reason for use of such a criterion is to avoid very small size divestments.

2) The divestors' shares have been trading on the stock market for the whole of the estimation period (days -180 to -41) and observation period (days -40 to +40).

3) Although all divestors must be UK registered listed companies, divestments of foreign subsidiaries are included. In this latter case, the value of the sold off part is converted to sterling pounds at the rate of exchange prevailing at the time of divestment.

4) To avoid the impact of other events on the observed returns, any divestor involved in other divestments, take over bids, mergers or acquisitions during the observation period -40 to +40 was excluded from the sample. However, if two divestments were declared on the same day, the values of the two were aggregated and the two were treated as one divestment and included in the sample on this basis.

With the above selection criteria we arrived at a final sample of 178 out of 742 divestments in the UK announced during 1985 - 1986. Table 4.1 shows the monthly distribution of publicly announced sell-offs.

Table 4.1- Distribution of the UK Sell-offs and Sell-offs in the Sample (1985-1986).

	1985		1986	
	All	Sampled	All	Sampled
JAN	30	8	24	7
FEB	31	9	37	9
MAR	21	7	31	9
APR	19	3	22	2
MAY	14	1	27	-
JUN	28	2	37	5
JUL	33	12	27	7
AUG	42	8	37	9
SEP	33	8	28	7
OCT	36	6	42	16
NOV	41	6	33	10
DEC	28	4	41	23
Total	356	74	386	104

4.10.4 SAMPLE CHARACTERISTICS

Our sample of 178 divestors drawn from 742 divestments by UK firms in 1985-86 covers a wide spectrum of industries and is not biased towards particular sectors as shown by the industry distribution of our sample in Table 4.2.

Table 4.2 Distribution of Divestor's Industry Sector

Industry Sector	NO.
Oil Exploration and Production	5
Building & Construction	3
Building Materials & Merchants	5
Chemicals	4
Electronics & Electrical Equipment	7
Engineering	25
Engineering, Vehicles	3
Printing, Paper & Packaging	7
Textiles & Apparel	4
Breweries	2
Food Manufacturers	7
Household Goods	2
Health Care	1
Pharmaceuticals	2
Tobacco	4
Distributors	1
Leisure & Hotels	8
Retailers, Food	2
Retailers, General	6
Transport	3
Banks	4
Insurance	7
Merchant Banks	1
Other Financial	3
Property	4
Other Services & Businesses	50
Total number of divestors:	178

In Table 4.2 industry sectors were found from Acquisitions Monthly and grouped under the Financial Times presentation format. They correspond to Financial Times classification.

Table 4.3 shows the distribution of divestors' market capitalisation in different size categories. From this table, our sample appears to be representative of different sizes of divestors. Table 4.4 provides a similar distribution for divestment size. This tables suggests that divestments are concentrated at the lower end of the size range. This is consistent with the mean relative divestment size of 10% and median of 4.4% reported in Table 7.1 (see below).

Table 4.3 Divestors Market Size Distribution in Million £.

Range in £m	Number in the sample
0 - 5	12
5 < 10	20
10 < 50	43
50 < 100	18
100 < 500	40
500 < 1000	21
1000	24
Total	178

Table 4.4 Divestees Size Distribution

Range in £m	Number in the sample
.25 < 1	40
1 < 5	48
5 < 10	16
10 < 50	29
50 < 100	4
100 < 500	4
500 < 1000	1
Total number of price declarers	142

Note: There are only 142 cases of price declarers out of a total of 178 announcements. Price of sell-off was not announced in 36 cases.

4.11 DAILY SHARE PRICES

Daily share price data is obtained from Datastream. These share prices are end-of-the-day share prices. Where no trading is recorded for a share on a specific date, the last traded price is recorded. This may result in a sequence of unchanged prices for a number of days, giving rise to the problem of thin or non-synchronious trading. Logarithmic stock returns were calculated viz:-

$$R_{it} = \ln \frac{P_{it} + D_{it}}{P_{it-1}} \qquad (4.30)$$

where

P_{it} = price of security i at time t

D_{it} = dividend paid during time interval t.

The dividend was added to the ex dividend day price as this would be expected to drop by the value of the dividend on the ex dividend day. Rights and scrip issues are already adjusted for by Datastream. The market return is calculated from the F.T. All Share Index incorporating dividend yield as

$$R_{mt} = \ln \frac{FT_t + \frac{1}{260}DY}{FT_{t-1}} \tag{4.31}$$

Where

R_{mt} = Market return at time t,

$F.T_t$= *F.T.* All Share Index at time t,

DY = Annual F.T. Dividend Yield

The reason for dividing annual dividend yield by 260 is that there are 260 trading/data days in a year i.e. 52 weeks x 5 days.

Relative size was calculated by dividing the value of the sell-off to the market valuation of the parent on the last day of the month prior to the divestment date. The reason is that the market value is best measured outside event days so that it is not affected by the event.

4.12 SUB-SAMPLES

As explained in Chapter 3 to find the impact of price declaration and the certainty of deal completion, our sample is divided by price and completion announcement criteria. This categorisation leads to the following sub-sample sizes:

Total Sample n = 178

Sub-Sample 1 - Intention Group n = 86

Sub-Sample 2 - Completion Group n = 92

Sub-Sample 3 - Price Disclosure Group n = 142

Sub-Sample 4 - No-Price Group n = 36

Sub-Sample 5 - Intention Price Group n = 69

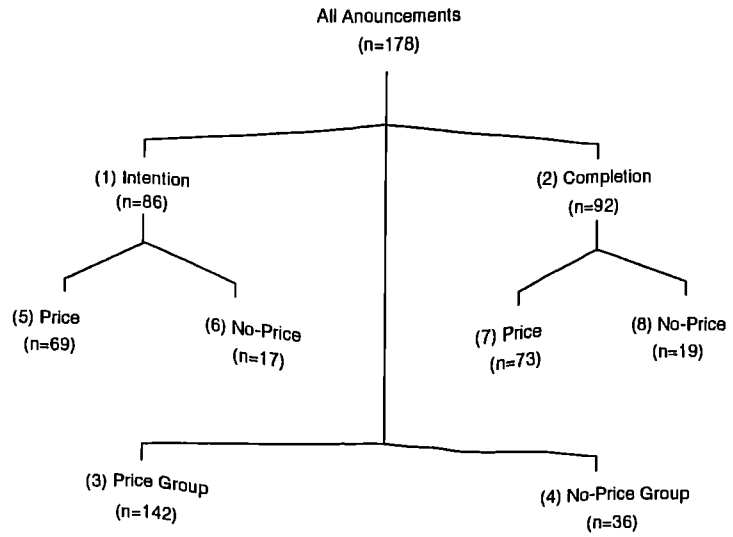
Sub-Sample 6 - Intention No-Price Group n = 17

Sub-Sample 7 - Completion Price Group n = 73

Sub-Sample 8 - Completion No-Price Group n = 19

Chapter 5 will report the results for each of our sub-samples. The following tree provides a visual picture of how our sub-samples fit together.

Fig.4.1 Tree of Sub-samples



CHAPTER 5 EMPIRICAL RESULTS

Chapter 4 discussed our hypotheses and described the methodology employed to test these. This chapter reports the empirical results for various sub-samples using the Market Model and Dimson's method of adjusting for thin trading and based on the dependence assumption concerning the abnormal returns. Results based on alternative models and the Scholes and Williams method are reported in Chapter 6 for comparative purposes.

5.1 ALL ANNOUNCEMENTS

The hypothesis being explained in sections 5.1 to 5.4 is

H1: Corporate sell-offs do not lead to any significant change in divesting company shareholder wealth.

If the UK stock market is informationaly efficient in a semi-strong sense we would expect instantaneous impounding of new public information with respect to any particular event. We have no information on Financial Times reporting lags. However, characteristically financial press reports are based on press releases which tend to be issued during market trading hours, leading to reporting in the Financial Times and the City pages of other newspapers the following morning. London Stock Exchange Yellow Book rules also allow disclosure of price relevant information between 3.30 p.m. when the market closes and 5.30.p.m., similarly permitting reporting in the financial press the following day. As explained in Section 4.10.1, the announcement dates are the press announcement days compiled by Acquisitions Monthly and defined as day '0'. Therefore, the actual event day may, typically, be day - 1, the 'rading day before the formal press announcement day. An added argument for considering day -1 as the event day is the likelihood of information leakage around the time of the divestment event even in advance of formal notification to the market. We thus focus

on day - 1 as the event day in our analysis as the most appropriate single day. However, due to the possibility of information leakage and problems of reporting lags, we may also be justified in considering (-2 to 0) as the event period (eg. Klein, 1986). In this study we report both the results for day -1 and days (-2 to 0).

Table 5.1-Time Series CARs and t-Statistics

All Announcements (n=178)

Interval (days)	CAR	t-statistics
-40 to +40	0.24	0.17
-40 to -11	-0.93	-1.08
-10 to +10	0.86	1.15
- 5 to + 5	-0.02	-0.03
- 5 to - 1	1.18	3.23[a]
- 5 to 0	1.05	2.44[a]
0 to + 5	-1.20	-2.99[a]
- 2 to 0	0.68	2.41[a]
- 1 to 0	0.65	2.82[a]
- 1	0.85	5.23[a]
0	-0.20	-1.24

Note: [a,b,c] indicate 1%, 5% and 10% levels of significance

Summary results are shown in Table 5.1. This explores whether undifferentiated sell-off announcements per se impact on shareholder wealth and provides daily and cumulative average excess returns for the full 178 firm divestment sample for the 81 day period surrounding the press announcement day, day 0.

Table 5.1 shows highly significant positive average excess returns of 0.85% (t = 5.23) for day - 1, followed by immediate and significant reversal in returns totalling 1.2% (t = 2.99) for the six day period from day 0 to day + 5). Days (-2 to 0) also show a CAR of 0.68% significant at 5% (t = 2.41). These results support the hypothesis that sell-offs per se lead to short term positive abnormal returns for shareholders of the divesting company. However, significant post-event performance reversal will be noted as will the lack of permanent revaluation of the firm. For the overall sample, considering the period around the event day (-5 to +5) or (-10 to +10) no significant abnormal returns are observed. Thus, we consider these results consistent with the value additivity postulate. However, such aggregate results may mask more interesting sub-sample reactions.

5.2 PRICE DECLARATION IMPACT

To examine the impact of price declaration on sell-offs we divide the sample into two groups: those that have declared the price for sale of the divested part and those that have not.

This division is irrespective of whether the announcement is one of intention or of completion as set out in Tables 5.2 and 5.3. Out of the sample of 178 divestments only 36 are unaccompanied by price information. Tables 5.2 and 5.3 show that in almost 80% of all sell-off cases the price is declared. They also show that irrespective of type of announcement almost the same percentage (ie. 80%) declare the price of the divested part.

Table 5.2- Breakdown of Sample in Terms of Price Declaration

Intention Price	69
Completion Price	73
Total Price Declared	**142**
Intention No-Price	17
Completion No-Price	19
Total Price Not-Declared	**36**
% of Price Declarers	**79.7%**

Table 5.3- Breakdown of Intention and Completion samples in Terms of Price Declaration

Intention Group	
Price Declared	69
Price not Declared	17
Total Intentions	**86**
% of Declarers	**80%**
Completion Group	
Price Declared	73
Price not Declared	19
Total Completion	**92**
% of Price Declarers	**79.3%**

5.2.1 PRICE DISCLOSURE GROUP

Table 5.4 summarises the abnormal return results for the Price group that includes samples from the Intention as well as the Completion groups. From this table of results we note a CAR of 0.96% (t = 3.01) for days (-2,0) and AR of 1.06% (t = 5.66) for day (-1), both highly significant (at 1%). Thus we conclude that sell-off announcements incorporating price are associated with an increase in divesting

company shareholder wealth. However, as with the full sample, there is major price reversal over days (0 to 5). Nevertheless, over the 21 day period around the press day, we find a positive CAR of almost 2%, significant at the 5% level, which suggests that sell-off announcements with price declaration may be viewed as a positive NPV decision, good news and not in harmony with the value additivity principle.

Table 5.4-Time Series CARs and t-statistics

Price Disclosure Group (n= 142)

Interval (days)	CAR (%)	t-Statistic
-40 to +40	1.10	0.65
-40 to -11	-1.48	-1.45
-10 to +10	1.98	2.32[b]
- 5 to + 5	0.49	0.79
- 5 to - 1	1.74	4.17[a]
- 2 to 0	0.96	3.01[a]
- 1 to 0	0.87	3.32[a]
- 1	1.06	5.66[a]
0	-0.18	-0.97
0 to + 5	-1.25	-2.73[a]

Note: [a,b,c] indicate 1%, 5% and 10% levels of significance

5.2.2 NO-PRICE GROUP

Table 5.5 summarises the abnormal return performance for the No-Price group that includes the Intention as well as Completion announcement cases. Inspection of the t-statistics for days (-2 to 0) and day (-1) for the No-Price group in the above

table shows that there is statistically insignificant negative and positive cumulative average abnormal returns of -0.23% and +0.05% respectively. These results suggest that sell-off announcements not incorporating price of the divested part are not associated with any significant change in divesting company shareholder wealth. This is in line with the value additivity principle and consistent with the null hypothesis that investors do not assume a positive NPV resulting from the divestment of an unknown value and classifying such an event as good news.

Table 5.5-Time Series CARs and t-statistics

No-Price Group (n= 36)

Interval (days)	CAR (%)	t-Statistics
-40 to +40	-3.17	-1.00
-40 to -11	1.24	0.64
-10 to +10	-3.59	-2.23[b]
- 5 to + 5	-1.97	-1.73
- 5 to - 1	-0.97	-1.31
- 2 to 0	-0.46	-0.74
- 1 to 0	-0.23	-0.46
- 1	0.05	0.16
0	-0.28	-0.82
0 to + 5	-1.00	-0.74

Note: [b] indicates the level of siginificance at 5%.

The CAR for days (-10 to +10) is -3.59% with t = 2.23 (significant at 5% level). This definite negative market reaction to a No-Price disclosure divestment is not in line with the value additivity principle and suggests the market may actually consider such informationally deficient divestments as bad news.

5.3 INTENTION GROUP

We now examine the results for our sub-group of firms announcing only intention to divest. The sample size is 86 and includes announcements that incorporate price and announcements that do not incorporate price. Table 5.6 summarises the results.

Table 5.6-Time Series CARs and t-Statistics

Intention Only (n=86)

Interval (Days)	CAR%	t-Statistics
-40 to +40	-1.39	-0.66
-40 to -11	-1.97	-1.54
-10 to +10	1.16	1.09
- 5 to + 5	0.90	1.16
- 5 to - 1	1.36	2.61[a]
- 2 to 0	0.78	1.94[c]
- 1 to 0	0.40	1.23
- 1	0.21	0.92
0	0.19	0.82
0 to +5	-0.24	-0.80

Note: [a,b,c] indicate 1%, 5% and 10% levels of significance.

The average abnormal return for day (-1) is only 0.21% which is statistically insignificant. However, the CAR for days (-2 to 0) is 0.78% with t = 1.94, which is statistically significant at the 10% level. Days (-10 to +10) produce a CAR of 1.16%, which is statistically insignificant. We do not really have strong evidence to conclude that in general the anouncement of Intention of sell-off alone is regarded as good news and a positive NPV decision.

The Intention subsample of 86 cases includes divestments which have the price declared (n = 69) and divestments without price declaration (*n* =17). Considering that 80% of cases in the sample of 86 have declared the price, we may suspect that the implied certainty of the deal being completed denoted by price disclosure in the 69 cases, or information on relative valuation, may be affecting our results. We thus examine the abnormal returns for the two sub-samples of Intention - Price and Intention - No Price firms.

5.3.1 INTENTION-PRICE GROUP

The abnormal return results for the sample of 69 cases of intention announcement that incorporate price are set out in Table 5.7. It is interesting to note CAR for days (-5 to -1) is 1.82%, statistically significant at 1%, whereas the AR for day (-1), is statistically insignificant. The CAR for days (-2 to 0) is 0.96%, siginificant at 5% level. The CAR for days (-10 to +10) is 1.96% and significant at the 10% level. Based on these results, we conclude that sell-off intention announcements incorporating price are associated with positive changes in divesting company shareholder wealth.

This result is not in line with the value additivity theory and suggests a positive NPV estimate by the market. Despite the lack of certainty of the deal being

completed, there may be some confidence in the deal being consummated as a price is indicated possibly suggesting an advanced negotiation stage between the two parties.

Table 5.7-Time Series CARs and t-Statistics

Intention-Price Group (n=69)

Interval (Days)	CAR%	t-Statistics
-40 to +40	-1.28	-0.55
-40 to -11	1.92	1.35
-10 to +10	1.96	1.66[c]
- 5 to +5	1.02	1.19
- 5 to -1	1.82	3.13[a]
- 2 to 0	0.96	2.14[b]
- 1 to 0	0.53	1.49
- 1	0.30	1.19
0	0.23	0.91
0 to +5	-1.02	-1.25

NOTE: [a,b,c] indicate 1%, 5%, and 10% levels of significance.

5.3.2 INTENTION NO-PRICE

The summary of CARs for Intention announcements with no price declaration is provided in Table 5.8. There are 17 cases of announcements of sell-offs without price declared. This sample is rather small to draw definite conclusions from. However, Klein (1986) conducts tests on a sample of only 15 companies. We observe a CAR of 0.06% for days (-2 to 0) and a AR of -0.15% for day (-1). Both

CARs are insignificant. CARs of -2.09% for days (-10 to +10) are also insignificant. Therefore, noting the limitations of the size of our sample of 17 firms, we conclude that we have no evidence that sell-off intention announcements not incorporating price are associated with significant change in divesting company shareholder wealth. This is in line with the value additivity theory and may suggest that too little is known by the market to attach a positive NPV to the particular decision to divest.

Table 5.8-Time Series CARs and t-Statistics

Intentions No-Price Group (n=17)

Interval (Days)	CAR%	t-Statistics
-40 to +40	-0.38	-0.37
-40 to -10	-0.23	-0.07
-10 to +10	-2.09	-0.81
- 5 to +5	0.42	0.22
- 5 to -1	0.28	1.82[c]
- 2 to 0	0.06	0.06
- 1 to 0	-0.14	-0.18
- 1	-0.15	-0.28
0	0.009	0.01
0 to +5	0.88	0.64

NOTE: [a,b,c] indicate 1%, 5%, and 10% levels of significance.

5.4 COMPLETION GROUP

In this section a sub-sample of companies that first announced the completion of a divestment is examined. This sub-sample consists of 92 divestments of which 73 include price declaration and 19 do not incorporate price disclosure. Table 5.9 provides a summary of overall completion sub-sample CARs.

Table 5.9-Time Series CARs and t-Statistics

Completion Sample Only (n=92)

Interval (Days)	CAR%	t-Statistics
-40 to +40	1.72	0.84
-40 to -11	0.04	0.03
-10 to +10	0.55	0.53
- 5 to + 5	-0.87	-1.16
- 5 to - 1	1.01	1.99[b]
- 2 to 0	0.58	1.49
- 1 to 0	0.87	2.73[a]
- 1	1.44	6.39[a]
0	-0.57	-2.52[b]
0 to 5	-1.89	-3.73[a]

NOTE: [a,b,c] indicate 1%, 5% and 10% levels of significance.

Table 5.9 shows highly positive abnormal returns of 1.44% on day (-1) with t-statistic of 6.39, which is significant at the 1% level. Therefore, based on day (-1) results we can conclude that announcement of completed-sell offs is associated with a significant increase in divesting company shareholder wealth. However, CARs of days (-2 to 0)

and days (-10 to +10) do not confirm the same results. In addition there is significant CAR reversal on days (0 to 5). We thus need to disaggregate the full sample to seek a possible explanation.

5.4.1 COMPLETION-PRICE GROUP

The Completion-Price firms constitute a sub-sample of 73 cases out of the overall sample of 92 cases in the Completion group. A summary of abnormal returns is shown in Table 5.10.

Table 5.10- Time Series CARs and t-Statistics

Completion-Price Group (n=73)

Interval (Days)	CAR%	t-Statistics
-40 to +40	3.32	1.41
-40 to -11	-0.27	-0.18
-10 to +10	1.99	1.66[c]
- 5 to +5	-0.01	-0.02
- 5 to -1	1.62	2.86[a]
- 2 to 0	0.99	2.16[b]
- 1 to 0	1.17	3.20[a]
- 1	1.74	6.74[a]
0	-0.57	-2.24[b]
0 to +5	-1.68	-2.63[a]

NOTE: [a,b,c] indicate 1%, 5% and 10% significance levels.

The CAR result for days (-2 to 0), showing an almost 1% positive abnormal return, is significant at the 5% level and AR for day (-1) and days (-1 to 0) are

significant at 1% level. The CAR for days (-10 to +10) is also significant at the 10% level. Therefore we conclude that completion announcements incorporating the sell-off price are associated with significant changes in divesting company shareholder wealth. The market seems to consider a completed sell-off with a definite price as good news. The market indeed appears to overreact to such good news and corrects itself on day (0) by producing -0.57% abnormal return which is significant at the 5% level, and a -1.68% CAR (significant at the 1% level) for days (0 to 5).

5.4.2 COMPLETION NO-PRICE

Table 5.11-Time Series CARs and t-Statistics

Completion No-Price Group (n=19)

Interval (Days)	CAR%	t-Statistics
-40 to + 40	-4.33	-1.11
-40 to -11	2.16	0.91
-10 to +10	-4.94	-2.48[b]
-5 to +5	-4.20	-2.92[a]
-5 to -1	-1.53	-1.58
-2 to 0	-0.91	-1.22
-1 to 0	-0.30	-0.49
-1	0.25	0.57
0	-0.55	-1.28
0 to +5	-2.68	-2.63[a]

NOTE: [a,b,c], indicate 1%, 5% and 10% significant levels.

A sub-sample of 19 completed sell-offs without price declaration is drawn from 92 completion announcements. Cumulative abnormal returns for this category are

calculated and summarised in Table 5.11. The t-statistics for days (-2 to 0), day (-1) and day (0) show weak and non- significant cumulative abnormal returns. Abnormal returns on day (-1) is only 0.25%. However, CARs for days (-5 to +5) and (-10 to +10) at -4.2% and -4.9% respectively, both highly significant, suggest strong negative market reaction which may relate to the uncertainty about the price or the lack of information disclosure.

5.5 PRICE DISCLOSURE IMPACT

To examine the impact of price disclosure per se we test statistically the significance of price disclosure on the overall firm sample as well as on the separate Intention and Completion sub-samples.

5.6 PRICE DECLARATION IMPACT ON THE ALL SAMPLE

We test our hypothesis

H2: Changes in shareholder wealth are independent of price disclosure at announcement.

To test this, the difference in CAR is measured between two sub-samples of Price (sub-sample 3, n= 142) and No Price (sub-sample 4, n=36) - for sub-sample numbering see Section 4.12. The period of test is over days (-2 to 0). The reason for testing over a three day interval is to incorporate any leakage of information in the most immediate period surrounding the event. CAR_i (-2 to 0) represents the CAR for days (-2 to 0) of sub-sample i and $t_{i,j}$ denotes the t-statistics for difference between sub-sample i and j. The test statistic for the differences in cumulative abnormal returns between two sub-samples is discussed in Chapter 4.

Table 5.12: Price Impact Analysis - CAR (%) for Days (-2 to 0)

Sample	Price	No-Price	Difference t-statistics
All	0.96	-0.45	2.09[b]
Intention	0.96	0.07	0.84
Completion	0.99	-0.91	1.90[c]

Note: [b] indicates significance at the 5% level

Based on Table 5.12: CAR_3(-2 to 0)= 0.96%

CAR_4(-2 to 0)=-0.45%

The t-statistics for difference in mean CARs is:

$t_{3,4}$=2.09 (significant at 5%).

The null hypothesis is clearly rejected. We conclude that price is of key importance in producing positive abnormal returns on divestment announcement irrespective of whether the announcement is of intention to divest or of completion of divestment. However, to assess the pure impact of price disclosure, we need to test the impact of price on sub-samples of Intention and Completion firms separately. As far as certainty of the value of the deal is concerned we need to test for price disclosure on a sub-sample of completion announcement in order to have accounted for certainty of completion impact on announcement abnormal returns.

5.6.1 PRICE DECLARATION IMPACT ON INTENTION SUB-SAMPLE

H2 is now tested on the two sub-samples of Intention-Price and Intention-No Price Groups.

t-statistics are calculated for differences in the CARs for the two sub-groups of the Intention sample (n=86): the Price group (sub-sample 5, n = 69) and the No-Price group (sub-sample 6, n = 17). Based on Table 5.12, CARs for day (-2 to 0) are:

CAR_5 (-2 to 0) = 0.96%

CAR_6 (-2 to 0) = 0.07%

The t-statistic for difference in mean CARs is $t_{5,6}$=0.84 which is not significant at conventional levels.

The null hypothesis cannot be rejected and we therefore conclude price declaration does not seem to have a significant positive impact on abnormal returns at announcements of sell-off intentions.

5.6.2 PRICE DECLARATION IMPACT FOR COMPLETION SUB-SAMPLE

H2 is now tested on the two sub-samples of Completion - Price and Completion - No Price groups.

The difference between the CARs of the two sub-samples of Completion (n = 92) are calculated. That is the difference between Completion-Price (sub-sample 7, n = 73) and Completion-No Price (sub-sample 8, n = 19), based on Table 5.12:

CAR_7 (-2 to 0) = 0.99%

CAR_8 (-2 to 0) = -0.91%

The t-statistic for the difference in CARs is $t_{7,8}$ = 1.90 (significant at 5% level).

The null hypothesis H2 is thus rejected based on the above analysis and comparison. We, therefore, conclude that despite the news of completion of the deal the price declaration has significant positive impact on abnormal returns produced on announcemnt of a completed sell-off. This suggests that although the market is certain of the deal being completed, provision of price information is of great *significance* in enhancing shareholder wealth.

The above hypothesis, which is tested for the pure impact of price disclosure within a completed deal sub-sample, constitutes an original contribution to the field of sell-off studies.

5.6.3 PRICE DECLARATION IMPACT -FURTHER ANALYSIS.

Further analysis of difference in CARs is conducted on the full Price and No-Price sub-samples irrespective of Intention and Completion division. This analysis is conducted by examining the CAR difference over other time intervals than (-2,0) as shown in Table 5.13.

The differential impact of price declaration is quite dramatic with event day average excess returns a highly significant 1.06% for the price declaration sample (t = 5.67) but a negligible 0.06% (t =0.16) for the No-Price sample. This difference is significant at the 1% level. Over the 21 day period, -10 to +10, surrounding the announcement event, CARs are 1.98% for the price group and -3.59% for the No-Price group, both significant at the 5% level with the difference between the CARs significant at the 1% level. Because the price non-declarers only account for 20% of the overall sample, we can see how the ALL sample results reported earlier are driven by price disclosures alone. We are thus forced to conclude that only

sell-offs with prices announced lead to positive abnormal returns on the event day and a price declaration is necessary for significant abnormal returns to be generated. The overall impact of price disclosure is consistent with the interpretation that it serves to reduce uncertainty in the divestment process.

Table 5.13- Time Series CARs (%) for Various Intervals,

Price and No-Price Groups

	Sample		
Interval (days)	Price (n=142)	No Price (n=36)	Difference Price-No-Price
-40 to +40	1.10	-3.17	4.27
-40 to -11	-1.48[b]	1.24	-2.72
-10 to +10	1.98[b]	-3.59[b]	5.57[a]
- 5 to + 5	0.49	-2.03[c]	2.52[a]
- 5 to - 1	1.74[a]	-1.03	2.77[a]
- 2 to 0	0.96[a]	-0.45	1.42[b]
- 1	1.06[a]	0.05	1.00[a]
0	-0.18	-0.29	0.11
0 to + 5	-1.25[a]	-1.00	-0.25

Note: [a,b,c] indicate 1%, 5%, and 10% levels of significance

Is it the sell-off announcement itself that is generating the abnormal return or is it the decision to announce the price that leads to reduced market uncertainty and positive abnormal returns as a result? If it were the divestment announcement per se that represented "good news" then we would expect our No-Price sample to behave in a similar manner.

5.7 COMPLETION ANNOUNCEMENT IMPACT

We can test for the impact of announcement of completion of the divestment by finding the statistical significance of the differences in mean CARs between:

1) the Intention and the Completion sub-samples (see Section 5.7.1),

2) Intention-Price and Completion-Price groups (see Section 5.7.2),

3) Intention-No Price and Completion-No Price group (see Section 5.7.3).

Table 5.14-Time Series CARs (%) for Various Intervals:

Completion and Intention Only Samples

	Sample		
Interval (days)	Completion (n=92)	Intention (n=86)	Difference Comp.-Int.
-40 to +40	1.73	-1.40	3.13
-40 to -11	0.04	-1.97	2.01
-10 to +10	0.56	1.17	-0.61
- 5 to + 5	-0.88	0.90	-1.78[c]
- 5 to - 1	1.01[b]	1.36[a]	-0.35
- 1	1.45[a]	0.22	1.23[a]
- 2 to 0	0.58	0.78	-0.20
0	-0.57	0.19	-0.76[b]
0 to + 5	-1.89[a]	-0.46	-1.43[c]

Note: [a,b,c] indicate 1%, 5%, and 10% levels of significance

5.7.1 COMPLETION ANNOUNCEMENT IMPACT ON ALL SAMPLE

The null hypothesis being tested is

H3: Changes in shareholder wealth are independent of whether the firm announces completion of sell-off or only an intention to divest.

We would expect potential uncertainty surrounding the sell-off event to be reduced substantially in the case of a finalised agreement compared with one where negotiations are presumably not concluded. To test this hypothesis the entire sub-samples of Intention (1) and Completion (2), are compared and the difference in mean abnormal return over the period (-2 to 0) is tested for statistical significance. Based on Table 5.14:

CAR_1 (-2 to 0)= 0.78%

CAR_2 (-2 to 0)= 0.58%

t-statistics for the difference in mean CARs is $t_{1,2}$=0.35.

The null hypothesis cannot, therefore, be rejected when tested for days (-2 to 0). However, the same hypothesis tested for day (-1) is rejected with 1% level of significance (see Table 5.14). We clearly see that the abnormal return reversal on day (0) for the Completion sub-sample reduces the CAR for the days (-2 to 0) to the extent that *the same hypothesis* cannot be rejected.

As the actual market announcement day is day (-1), we would suggest that the impact of Completion should be assessed on this day alone. This is borne out by Table 5.14 which shows highly significant event day CAR = 1.45% (t = 6.39) for the Completion group but only 0.22% (t = 0.93) for the Intention group with the difference in the two CARs significant at the 1% level.

This leads to the conclusion that the removal of uncertainty of the deal being consummated increases the abnormal return indicated on the divestment.

Table 5.14 highlights a degree of ambiguity in our results in that for the immediate post event period, day 0 to day +5, the relative performance of the two samples reverses with the Completion sample significantly underperforming the Intention sample at the 10% level. Similar reversal was observed earlier with the ALL price disclosure samples (see Table 5.4). One might explain such reversal in terms of market correction on removal of uncertainty after receipt of Price or Completion information.

5.7.2 COMPLETION ANNOUNCEMENT IMPACT ON PRICE SUB-SAMPLE

The null hypothesis being tested is

H3: Changes in shareholder wealth are independent of whether the firm announces completion of sell-off only an intention to divest.

H3 is now tested separately on the Price Disclosure sub-samples. Here the statistical significance of the difference in mean cumulative abnormal returns over(-2,0) for the Intention-Price sub-sample (5) and Completion-Price sub-sample (7) is compared. Based on Table 5.15A:

CAR_5 (-2 to 0) = 0.961%

CAR_7 (-2 to 0) = 0.994%

The t-statistic for the difference in mean CARs is $t_{5,7}$= 0.05.

The null hypothesis cannot be rejected. This suggests that when the price is declared the market is fairly certain of the deal reaching completion and the additional information content of the completion of sell-off as against mere intention to sell may be small and insignificant.

5.7.3 COMPLETION ANNOUNCEMENT IMPACT ON NO-PRICE SUB-SAMPLE

H3 is tested, this time using the two No-Price sub-samples of Intention and Completion. The statistical significance of the difference in mean cumulative abnormal returns over (-2,0) between the Intention No-Price sub-sample (6) and the Completion-No Price sub-sample (8)is considered. Here, based on Table 5.15 Panel A, in Section 5.8:

CAR_6 (-2 to 0) = 0.065%

CAR_8 (-2 to 0) =-0.91%

$t_{6,8}$ = 0.80

The t-statistic for the difference of mean of subsample 6 and 8 is $t_{6,8}$ =0.80 which is clearly not significant and we therefore conclude that the announcement of Completion does not make a significant impact on CARs in the absence of price information.

5.7.4 COMPLETE CERTAINITY

As far as the market is concerned there are two elements that may cause uncertainty

a) unknown price of divestment

b) doubt about completion of divestment.

To assess the value of certainty to the market two extreme sub-groups are compared with each other:

Completion-Price (n=73, sub-sample 7) and Intention-No Price (n=17,sub-sample 6). Where AR(-1) is average abnormal return on day (-1), based on Table 5.15 Panel A, in section 5.8, we find:

$$AR_6(-1) = -0.16\%$$

$$AR_7(-1) = 1.76\%$$

$$t_{7,6} = 2.54$$

The t-statistic for the difference of mean of sub-sample 6 and 8 is $t_{6,7} = 2.54$ which is almost significant at the 1% level. The results indicate marked differences between the CARs of the Completion-Price and Intention-No Price samples and demonstrate that confirmation of price on Completion announcement, enhances the shareholder wealth materially. This test, we suggest, assesses the value of complete certainty to the market in terms of price and consummation of a sell-off. The choice of abnormal return on day (-1) rather than over the days (-2 to 0) assists in assessing the impact of the information available to the market on announcement day (-1). In this respect it is a test which is sharper and more appropriate for our analysis than the test over (-2 to 0). The t-statistic for the differences in mean over the day (-2 to 0) is only t = 0.46 and not significant.

5.8 PRICE - NO PRICE AND COMPLETION - INTENTION INTERACTIONS.

Results so far indicate that price disclosure has a decisive and positive impact on shareholder wealth whereas the stockmarket impact of a completion as opposed to an intention announcement is more ambiguous. From our earlier discussion of these contingent variables it was hypothesized that the impact of price disclosure was a function of whether the firm announced intention or completion, together with price. To explore the interaction between price disclosure and divestment status CARs for four sub-samples are examined, over various intervals. That is:

i) Completion with price (n = 73),

ii) Completion with no price (n = 19),

iii) Intention with price (n = 69),

iv) Intention with no price (n = 17).

Panel A of Table 5.15 provides summary event day and cumulative average abnormal return information for the Completion Price and Intention Price sub-samples and similar details for the two non-price samples. In Panel B the difference in CARs for different intervals between pairs of the four sub-samples is shown.

Table 5.15- Impact of Price Disclosure and Intention/Completion on CARs (%)

Panel A: CARs of Sub-samples

	Completion (2)		Intention (1)	
Interval (days)	Price (3) (n=73)	No-Price (4) (n=19)	Price (5) (n=69)	No Price (6) (n=17)
-40 to +40	3.21	-4.34	-1.29	-1.88
-10 to +10	1.99[c]	-4.94[a]	1.97[c]	-2.09
- 5 to + 5	-0.01	-4.21[a]	1.02	0.42
- 5 to - 1	1.67[b]	-1.53	1.81[a]	-0.47
- 1	1.76[b]	0.25	0.31	-0.16
- 2 to 0	0.99[b]	-0.91	0.96[b]	0.07
0	-0.58[b]	-0.56	0.24	0.01
0 to + 5	-1.68[a]	-2.68[a]	-0.79	0.89

Panel B: Difference in CARs between Sub-samples

Interval (days)	Completion Price - No Price	Intention Price - No Price	Price Comp.-Int.	No Price Comp.-Int
-40 to +40	7.55[c]	0.59	4.50	-2.46
-10 to +10	6.93[a]	4.06	0.02	-2.85
- 5 to + 5	4.20[a]	0.60	-1.03	-4.63[b]
- 5 to - 1	3.20[a]	2.28[c]	-0.14	-1.06
- 1	1.51[a]	0.47	1.45[a]	0.41
- 2 to 0	1.90[b]	0.89	0.03	-0.98
0	-.02	0.23	-0.82[b]	-0.57
0 to + 5	1.00	-1.68	-0.89	-3.57[b]

Note: [a,b,c] indicate the 1%, 5% and 10% levels of significance.

Numbers in brackets indicate sub-samples (See Section 4.12).

Event day excess return is significant only for the Completion Price sample with AR = 1.76% (t = 6.75), although the 5 day interval CAR from -5 to -1 is of a similar magnitude for the Intention Price sample with CAR = 1.81% (t = 3.14%). It would appear that provided price is disclosed, both types of announcement convey new information, although in the Completion case excess returns are earned primarily on the event day whereas for the Intention sample these are earned in advance of the formal announcement date. That the -10 to -2 day CARs for the two samples not shown in this table 1.26% (t=1.61) and 2.18% (t=2.79) respectively, may serve to emphasise this point.

In both cases, reversal in returns occurs after the event day with CARs for days 0 to 5 of -1.68% (t = -2.63) for the Completion sample and -0.79% (t = -1.25) for the Intention sample. However, overall both samples earn almost identical cumulative excess returns of 1.99% (t = 1.66) and 1.97% (t = 1.67) in the month (21 trading days) centred on the press date.

Turning to the two small price non-disclosure samples, we firstly note a seemingly random pattern in returns for Intention only announcements with apparently little impact on shareholder wealth. On the other hand, Completion announcements not accompanied by price disclosure are associated with substantial negative cumulative average excess returns of -4.21% (t = 2.93) over the 11 trading day period (day - 5 to + 5) centered on press day 0. Overall, there is a 7.55% difference in CARs, significant at the 10% level, between Completion samples with price and without price between day - 40 to day + 40 (Panel B).

Results in Panel B make interesting reading. While price declarers generally register a superior performance over non-declarers, the magnitude of the difference is clearly greater for the Completion group except on day (0) (see columns 2 and 3 in Table

5.15, Panel B). Where both groups declare price the Completion group performs better on the event day but the Intention group outperforms on the press announcement day (see columns 2 and 3 in Table 5.15 panel B). Over other intervals (e.g. - 10 to + 10 days) the performance of the two groups is statistically indistinguishable (see column 4, Table 5.15, Panel B). With price disclosed, therefore, the divestment status - completed or intented - seems to have an ambiguous impact.

The last column in Panel B shows that in the absence of price the Completion sample significantly underperforms the Intention only sample over the period day -5 today +5. This is consistent with our speculation that the market, being unable to assess the economic significance of the completed divestment, may be tending to place the saturnine "skeleton in the cupboard" interpretation on the divestment decision amd marking down the divestor's stock. With the Intention group the market seems to suspend judgment on the merits of the sell-off in the absence of price. Indeed, in the Intention case, the absence of price disclosure may be part of the uncertainty about the consummation of the sell-off and may, therefore, not be viewed particularly seriously by the stock market. This interpretation is consistent with the relatively weak statistical results for the difference in CARs between the Intention Price and Intention No-Price sub-samples (column 2, Table 5.15, Panel B).

Table 5.16 summarises the statistical results so far in terms of event day AR and CAR for the month surrounding the press day arranged in decending CAR magnitude. As can be seen the three sell-off samples disclosing price information head the table and the three no-price samples are at the foot with an almost 7% difference in CARs exhibited over the trading month between the Completion Price sample and the Completion No-Price, ranked last. Table 5.16 confirms the over-riding importance of price disclosure to the market's evaluation of the firm's divestment decision.

Table 5.16- Event Day ARs and 21 Trading Day CARs

For Various Samples in Descending CAR Magnitudes

Sample	n	AR-1 (t)	CAR -10 to +10 (t)
Competion Price	73	1.76 (6.74[a])	1.99 (1.66[c])
All Price	142	1.05 (5.66[a])	1.98 (2.32[b])
Intention Price	69	0.31 (1.20)	1.97 (1.67[c])
Intention	86	0.22 (0.93)	1.17 (1.09)
All firms	178	0.85 (5.23[a])	0.86 (1.15)
Completion	92	1.45 (6.39[b])	0.56 (0.54)
Intention No-Price	17	-0.16 (-0.28)	-2.09 (-0.81)
All No-Price	36	0.06 (0.16)	-3.59 (-2.24[b])
Completion No-Price	19	0.25 (0.58)	-4.94 (-2.49[a])

Note: [a,b,c] Indicate 1%, 5% and 10% levels of significance for the t-statistic figures in brackets.

In this chapter we reported our results based on Dimson adjusted betas and market model. there are, however, alternative methodologies for adjusting betas for thin trading such as Scholes and Williams method. There are also other models for generating abnormal returns asexplained in Chapter 4. These alternative methodologies have also been used for testing our data. Results of such tests are reported in Chapter 6.

CHAPTER 6 : IMPACT OF ALTERNATIVE METHODOLOGIES

The impact of varying the methodology on the results reported so far is examined from the following angles:

1) Calculation of β's in the OLS - market model.
2) Choice of prediction models.
3) Assumptions concerning the residuals.

The general impact of choice of methodology on event studies has been investigated by Brown and Warner (1985) using a simulation approach. This study aims to evaluate the impact of choice of methodology on our results so far. Assessment of the impact of methodology on sell-off study results has been ignored in most previous studies reviewed in Chapter 3.

6.1 IMPACT OF CHOICE OF βs

βs calculated in this study so far as reported in Chapter 5, are derived from daily share price data Dimson adjusted with 5 lags and 2 leads. As explained in Chapter 4, due to the presence of thin trading in the UK stock market, βs should be calculated using methods developed for treating the thin trading problem. Dimson (1979) and Scholes-Williams (1977) methods are both used to calculate βs here. The Dimson method, consists of multiple regressions of observed returns on preceding, synchronous and subsequent market returns with the derived coefficients summed to obtain an overall beta for a security. In this study various combinations of lags and lead terms were used to derive the Dimson adjusted βs. Lagged terms generally seemed to carry more weight. For this reason there are more lagged terms than lead terms in our regressions.

As the weighted average of all βs in the market should be 1, a search for a combination of numbers of lagged and lead terms that produced an average β closest to 1 was undertaken. The simple average unadjusted OLS beta for our sample firms at 0.74 is well below 1. This finding confirms those of Dimson (1979) and Scholes-Williams (1977), that in the presence of non-synchronous trading, average betas across securities are biased downwards and less than one. The inclusion of up to 5 lag terms brought βs closest to 1. Similarly the inclusion of lead terms increased the average βs for up to 2 lead terms. The highest average was obtained by choosing 5 lag and 2 lead terms as shown in Table 6.1.

Table 6.1- Average Betas Obtained from Combination of Lag and Lead Terms using the Dimson Method.

NO. OF LAGS	NO. OF LEAD TERMS	AVERAGE β
0	0	0.742
1	0	0.885
1	1	0.748
2	1	0.904
2	2	0.887
3	2	0.890
3	1	0.906
4	2	0.922
5	3	0.921
5	2	0.923

Table 6.2 shows the comparison between average βs not treated for thin trading and those treated by the Dimson and Scholes-Williams methods.

Table 6.2- Comparison of Average βs

Method	Average β
OLS Market Model	0.742
Dimson (5 lag,2 lead)	0.923
Scholes-Williams	0.760

We can see from table 6.2 that the Scholes-Williams method improves the average betas only slightly (from 0.742 to 0.760) whereas the Dimson (5 lags, 2 leads) method improves the average betas considerably (from 0.742 to 0.923). For this reason all the results reported in Chapter 5 were based on this adjustment. Using the ALL samples the evaluation of abnormal returns was repeated for:

1) a set of β's obtained from the Scholes and Williams model adjusting for thin trading.

2) a set of unadjusted β's formed by the OLS - market model.

3) the assumption of market adjusted β's - that is all β's equal 1. In this model all share prices move in harmony and at the same rate as the market, (see Chapter 4).

Comparisons of results of each β adjustment method is made under the dependence assumption and reported in Tables 6.3.

The results demonstrate that over the days -2 to 0, the 5% level of significance is only reached by adjusting βs for thin trading - i.e. t-statistics above 1.96. Student's t-statistic results for day 0, where negative abnormal returns are observed, are also listed in Table 6.3. It seems that adjusting βs for thin trading creates a positive shift in values of average abnormal returns. However, making Scholes and Williams or Dimson thin trading adjustments does not change the direction of the results. The only difference observed is in the magnitude of the abnormal returns and the

t-statistics. The βs derived from the Scholes and Williams treatment of thin trading show smaller abnormal returns and t-statistics for positive CARs for days (-2, 0) and larger magnitudes of negative CARs for day 0.

Table 6.3- Comparison of CARs and t-statistics Obtained from Different βEstimates for the All Sample under dependence assumption.

β Estimation Method	Day(-1) AR% (t)	Day(0) AR% (t)	Days(-2 to 0) CAR% (t)
DIMSON	0.85 (5.23)[a]	-0.20 (-1.24)	0.68 (2.41)[b]
SCHOLES & WILLIAMS	0.81 (5.00)[a]	-0.23 (-1.43)	0.60 (2.13)[b]
OLS - Market model, unadjusted β	0.79 (4.89)[a]	-0.26 (-1.58)	0.54 (1.94)[c]
Market Adjusted ie β=1	0.77 (4.60)[a]	-0.26 (-1.65)[c]	0.50 (1.74)[c]

Note: [a,b,c] indicate 1%, 5% and 10% levels of significance respectively.

6.1.1 MARKET ADJUSTED (β = 1) VERSUS OLS UNADJUSTED β's

We note that unadjusted βs produce results that are closer to the results produced by adjusting βs by the Dimson/Scholes and Williams methods. Thus we conclude that using unadjusted βs may be preferable to using market adjusted βs, despite

the thin trading present. It is important to note, from Table 6.3, that, on day -1, the levels of significance produced by all methods are very close. This suggests a lack of sensitivity to different abnormal return generating methods when average residual is of a large magnitude relative to the market return and the time period is short e.g. one day.

6.1.2 DIMSON VERSUS SCHOLES AND WILLIAMS METHODS

We now look at the difference in CARs from using βs adjusted by the Dimson, and Scholes and Williams methods as presented in Table 6.3. Comparing the cumulative abnormal returns produced for the days (-2 to 0) by both methods we find the difference in CARs (-2 to 0) between the two methods is 0.08% Similarly the difference in ARs for day -1 and day 0 of either method is only 0.04%. This confirms that there is hardly any change in the magnitude of our results obtained under either of these two β adjustment methods. The impact of the Dimson versus Scholes and Williams βs on a daily basis may be assessed from tables in the Appendix to this thesis.

6.2 CHOICE OF PREDICTION MODEL

The Mean Adjusted Model was not used due to systematic bias in our events caused by clustering over a 1985-1986 stock market boom period. Brown and Warner (1980, p232-235) demonstrate the relative unfavourable performance of Mean Adjusted Returns in the presence of clustering. Abnormal returns are calculated for the CAPM Model to see the impact of such change of prediction model on our earlier results. The risk free rate is taken to be the 3-month-Treasury bill rate.

6.2.1 MARKET MODEL VERSUS CAPM

We now consider for the difference in means of the cumulative abnormal returns over the period (days -2 to 0) in order to establish if the market and CAPM models lead to different results concerning the divestment announcements. Dimson adjusted βs are used in both cases. The difference in CARs over days (-2 to 0) is 0.003% which seems hardly significant. Therefore we conclude that choosing CAPM as prediction model in preference to the market model would have very little impact on our results and one might safely opt for the simpler market model for convenience. The difference in AR's for day - 1 and for day 0 between the two samples is also not significant. The Table 6.4 summarises the results for the CAPM and Market Model both under the dependence assumption and using Dimson βs:

Table 6.4- Comparision of CAR's between the Market Model and the CAPM - Dependence Assumption.

Interval (Days)	Market Model CAR(%)	CAPM CAR(%)
-40 to +40	0.242	0.143
-40 to 0	0.664	0.610
-10 to 0	1.520	1.507
-2 to 0	0.683	0.680
-2	0.032	0.031
-1	0.853	0.852
0	-0.202	-0.203

Note: None of the differences between the respective CARs is significant.

6.3 IMPACT OF DEPENDENCE/INDEPENDENCE ASSUMPTION.

The t-statistics reported so far through Chapters 5 and 6 were based on the dependence assumption (see Chaper 4). Under the dependence assumption the statistical tests allow for the possible cross-sectional dependence of abnormal returns. Cross-sectional dependence of the security-specific excess returns could exist if there are common influences on excess returns such as industry influences. Serial dependence is ignored as Brown and Warner (1985, p.19) do not find benefits arising from adjusting for serial dependence.

In the case of the independence assumption, the daily abnormal returns for each security are divided by the standard deviation of that security to yield a standardised abnormal return. Tables 6.5 and 6.6 provide a comparison of results of the dependence/independence assumption for days (-2 to 0) and day (-1) respectively using the full sample of 178 firms.

Table 6.5 shows that for the period surrounding the event day, -2 to 0 days, CARs obtained according to the independence assumption are considerably smaller than under the dependence assumption. Testing the whole sample adopting the independence assumption demonstrates a downward shift in t-statistic level of significance, for CAR(-2 to 0), from the 5% to the 10% level. Independence assumption t-tests are run for:

1) Market Model, Dimson βs

2) Market Model, Scholes and Williams βs

3) Market Model, Unadjusted βs

4) CAPM Model, Dimson βs and

5) Market Adjusted Model $\beta = 1$.

The results of the above tests are reflected in Table 6.6. There is a downward shift in the magnitude of abnormal returns and t-statistics when the independence assumption is made. This finding is the same across all the return generating models in the table. Although the downward shift is substantial, the significance level of abnormal returns is still at the 1% level. This is due to our already highly positive and significant results for day (-1). Since the systematic risk may not completely abstract all of the intercorrelations among security returns, the abnormal residuals are likely to be correlated. In the light of this the dependance assumption is probably more plausible.

Results for the AR on day (-1), that is the actual event day, demonstrate that irrespective of choice of prediction models and choice and/or treatment of thin trading, sell-off announcements produce positive abnormal returns significant at the 1% level. This finding may provide some comfort to other researchers in sell-off studies.

In this chapter we demonstrated the impact of various methodologies on the results reported in Chapter 5. It was shown that the choice of the Scholes and Williams' method as compared with the Dimson method made very little difference in the results. The unadjusted βs and market adjusted βs reduced the magnitude of abnormal returns and significant levels but altered neither the general direction of

the results nor the conclusions. The choice of CAPM as a prediction model compared with OLS-market model did not seem worthwhile as the results of both methods were highly close. However application of dependence and independence assumptions noticeably altered the magnitude of abnormal returns and the levels of significance.

Chapter 7 reports the impact of contextual variables, such as financial strength, relative size and completion/intention announcement, on market reaction to sell-offs.

Table 6.5- Comparision of CAR (-2,0) with Dependence versus Independence Assumptions -All 178 Firms.

	Dependence Assumption CARs(%) (z)	Independence Assumption CARs(%) (z)
Market Model, Dimson βs	0.683 (2.41)[b]	0.188 (1.44)
Market Model, Scholes & Williams βs	0.600 (2.13)[b]	0.154 (1.77)[c]
CAPM, Dimson βs	0.680 (2.40)[b]	0.184 (1.41)
β = 1	0.504 (1.74)[c]	0.121 (0.931)
Market Model, Unadjusted β	0.539 (1.94)[c]	0.146 (1.12)

Note: Numbers in parentheses denote t-statistics.

[b,c] indicate 5% and 10% significant levels

Table 6.6 - Comparison of AR on day-1 with Dependence versus Independence Assumptions.

	Dependence Assumption CARs(%) (t)	Independence Assumption CARs(%) (t)
Market Model, Dimson βs	0.853 (5.23)[a]	0.269 (3.59)[a]
Market Model, Scholes & Williams βs	0.813 (5.00)[a]	0.266 (3.55)[a]
CAPM, Dimson βs	0.852 (5.22)[a]	0.268 (3.58)[a]
β = 1	0.773 (4.60)[a]	0.234 (3.13)[a]
MarketModel,Unadjusted βs	0.786 (4.89)[a]	0.261 (3.41)[a]

Note: Numbers in parentheses denote t-statistics.

[a] indicates 1% significant level.

Chapter 7 : IMPACT OF CONTEXTUAL VARIABLES ON MARKET REACTION TO SELL-OFFS

7.1 RELATIVE SIZE AND FINANCIAL STRENGTH

To deepen our understanding of the market reaction to sell-off announcements, we adopt a multiple regression approach to assess the impact on shareholder wealth of firm disclosure of different pieces of information associated with the sell-off. In particular, we explore the impact of relative size of divestiture and whether the financial strength of the divesting firm is an important explanatory variable. Specifically, regression equations are developed to explore the relationship between excess return on the event day, completion/intention announcement, price disclosure/non-disclosure, relative size and financial status of parent.

Relative size of the divestiture is measured by the ratio of transaction price to market value of the divesting firm at the end of the month prior to the press day. Table 7.1 provides the distribution of relative sizes for the 142 cases where price was disclosed. As can be seen, in 69 cases, the sell-off price was 10% or less of the divestor's market valuation. Because of the highly skewed nature of the distribution and the presence of extreme outliers, analysis is focused on a binary variable set to 0 if relative size $\leq$10% and to 1 if relative size >10%.

Financial strength is measured by the divesting firm's z-score, calculated using the last available published accounts prior to the sell-off (Taffler, 1983), as explained in Chapter 4. If the company has a negative z-score it has financial characteristics resembling previously failed firms and the lower the z-score the more financially

distressed the firm. Conversely, the more positive the score the stronger the firm. Since it was not possible to compute z-scores for all firms due to business activities in certain cases being outside the scope of the two models employed, the sample size is reduced from 178 to 147.

Table 7.1 : Distribution of Relative Size of Divestment

RELATIVE SIZE	n	%
<10%	98	69
10 - 30%	26	18
30 - 60%	8	6
>60%	10	7
Total:	142	100

NOTE: This excludes 7 extreme cases with relative size above 80%.

(mean=10% and median 4.4%)

Table 7.2 presents the various regression models with event day i.e. day 0. AR as dependent variable. Model 1 in the table provides the results of the regression of excess return on the intention/completion announcement, the price disclosure binary variable and the z-score. The only statistically significant variable is z-score, with negative coefficient, which implies that the weaker the firm, the greater is the event day abnormal return - supportive of the "good news" interpretation of sell-offs by sick firms. The completion and price disclosure variables, although not significant, have signs in the direction consistent with uncertainty reduction.

In Model 2 of Table 7.2, where size replaces the Z-score as a variable, we note that it is significant at 5%. This means that larger relative size sell-offs produce larger abnormal returns on day (-1).

In Model 3 of Table 7.2, both size and z-score are included as explanatory variables. We find that z-score is significant at 10%. The relative size level of significance is, however, just under 10%. This shows that both relative size and z-score seem to be important factors in explaining size of abnormal returns.

Table 7.2 Regression of Event Day (-1) AR on Sell-off Characteristics: Completion, Price Disclosure, Relative Size and Z-score.

Model 1:

$$AR = \beta_0 + \beta_1 IC + \beta_2 Price \quad + \beta_4 Z + \varepsilon$$

Model 2:

$$AR = \beta_0 + \beta_1 IC \quad + \beta_3 Size + \varepsilon$$

Model 3:

$$AR = \beta_0 + \beta_1 IC \quad + \beta_3 Size + \beta_4 Z + \varepsilon$$

Model	Sample Size	CONSTANT β_0	IC β_1	PRICE β_2	SIZE β_3	Z-SCORE β_4	$\overline{R}^2$	$F_{(df)}$
1	147	0.38	1.25	0.69		-0.22[b]	0.03	2.51[c]
		(0.31)	(1.43)	(0.61)		(-2.21)		(3,143)
2	142	-0.19	1.08		1.97[b]		0.02	4.09[b]
		(-0.24)	(1.18)		(2.02)			(2,139)
3	120	0.36	1.43		1.86	-0.20[c]	0.04	2.65[b]
		(0.39)	(1.35)		(1.62)	(-1.68)		(3,116)

Notes:

1) Z is z-score. The explanatory variables except Z are dummy variables:
   IC equals O if Intention announced and 1 if Completion announced.
   Price equals 1 if price disclosed and 0 otherwise.
   Size equals 0 if relative size of divestment is <=10% and 1 otherwise.
2) Figures in parentheses except in the last column are t-statistics.
3) $_{df}$ = degrees of freedom.

4) [a,b,c] indicate 1%, 5% and 10% levels of significance.

Table 7.3 shows the Model 1 regressions with the abnormal returns over different intervals surrounding the divestment announcement as alternative dependent variables.

According to Table 7.3 regressing day (-1) and (-2 to -1) abnormal returns against z-score, Completion/Intention and Price/No-Price dummies show the z-score, with a negative sign, to be significant at the 5% level; but neither of the other two variables is significant. Day(0) abnormal returns regressed in Model 1 and 3 show significant levels of 5% and 10% for z-score respectively. This confirms our earlier findings for regressions of abnormal returns on day (-1). Therefore we conclude that the financial health of the divestor is negatively related to the excess return earned by stockholders incident on the sell-off announcement. This empirical finding may be consistent with the bankruptcy avoidance motive or "good news" argument about management actions and future performance.

Table 7.3: Regression of CARs on Intention/Completion, Price Disclosure, Z-score for differing periods (n=147).

DAYS	CONSTANT β_0 *(t)*	IC β_1 *(t)*	PRICE β_2 *(t)*	Z-SCORE β_3 *(t)*	$\overline{R}^2$	*F* *(df)*
0	-0.10 (-.235)	-0.60 (-1.023)	-0.10 (-.173)	0.10[c] (1.65)	.005	1.28 (3,143)
-1	0.38 (.31)	1.25 (1.42)	0.69 (.61)	-0.22[b] (-2.20)	.030	2.51[c] (3,143)
(-1,0)	0.1 (.195)	0.60 (.960)	0.50 (.640)	0.10 (-1.41)	.003	1.17 (3,143)
(-2,-1)	0.60 (.502)	0.60 (.643)	1.01 (.875)	-0.2[a] (-2.64)	.032	2.63[b] (3,143)
(-2,0)	1.30 (.451)	0.04 (-.001)	0.42 (.976)	-0.10 (-1.81)	.012	1.61 (3,143)

Note: [a,b] and [c] indicate significant levels at 1%, 5% and 10% respectively.

7.1.1 MULTI-COLLINEAVITY PROBLEMS

Multi-collineavity between our independent variables is studied using pairwise correlation coefficients between independent variables i.e. Relative Size (SIZE), Intention/Completion (IC), Price Disclosure (PRICE) and Z-score. These results are reported in Table 7.4.

TABLE 7.4 - Correlation Coefficient between Independent Variables Size IC, Price and Z.

VARIABLE	SIZE	IC	PRICE	Z
SIZE	1			
IC	0.025	1		
PRICE	N/A	-0.044	1	
Z	-0.133	0.025	-0.136	1

It appears that collinearity among the independent variables is very low with the correlation coefficient being -0.093 between Relative Size (SIZE) on z-score (Z). For definition and interpretation of multi-collinearity reference could be made to R.S. Pindyck and D.L. Rubinfield (1981).

The introduction of Z-score in Model 3 of Table 7.2 leads to a small decline in the coefficient of SIZE compared to Model 2 in the same table (from 1.97 to 1.86). However, the standard error of that coefficient changes very little from 0.0166 in Model 2 to 0.0169 in Model 3. We are therefore inclined to suggest that multicollinearity is not affecting our results in any significant way.

7.2 TESTS OF HYPOTHESES CONCERNING RELATIVE SIZE

In Chapter 4 we set out the following hypothesis about the impact of relative size on abnormal returns produced:

H4: Size of divestment relative to size of parent is not related to change in divestor shareholder wealth.

Based on the assumption that price disclosure has information content for the market and may, therefore, lead to abnormal returns for stockholders on a sell-off announcement, this hypothesis posits that the price disclosure perse rather than the relative size of sell-off is relevant to market participants' perception.

The Model 2 regression results show relative size to be significant at the 5% level. This clearly rejects the above null hypothesis. We therefore can conclude:

a) that the relative size of divestment is an important factor in determining the impact on share prices of sell-off announcements and b) that the market reaction is positively related to that factor. This finding is in harmony with the results of Klein (1986) who finds the relative size of sell-off to be positively correlated with excess return and of both Hearth and Zaima (1984) and Klein (1986) who find their portfolios of large divestitures significantly outperforming their portfolios of small divestitures in terms of abnormal returns produced. Our results are also in line with those of Hite and Owers (1983) and Miles and Rosenfeld's (1983) on the impact of relative size in the case of spin-offs.

One of the motives for sell-offs is the need for cash and bankruptcy avoidance (see Section 2.1.2). In such cases the release of financial pressures on the parent might have also triggered the positive market reaction. This leads us to our next hypothesis which cocerns the financial strength of divestor.

7.3 TEST OF HYPOTHESIS CONCERNING DIVESTOR'S FINANCIAL STRENGTH

Here we examine the relationship between potential financial distress of the divestor, as measured by the z-score, and abnormal returns on announcements. Our hypothesis as set in Chapter 4 is:

H5: The financial strength of the divestor does not affect market reaction to announcement of a sell-off.

This hypothesis relates to the "bankruptcy avoidance" motive, that is, the motive to raise cash in an attempt to ensure survival. Our results from the Model 1 regression show that the z-score is significant at 5% level. Therefore the above hypothesis is rejected and there is evidence that some of the abnormal returns produced may be due to release of financial pressure on the divestor.

This result is in harmony with the findings of Hite, Owers and Rogers (1987) who find total liquidation of the firm, the extreme case of corporate divestiture, to generate very substantial gains for shareholders. They demonstrate that in these cases, the market value of the divested pieces was greater in total than the market value of the firm as a whole. They, however, point out that these firms were not experiencing negative abnormal returns on the stock market, due to financial problems, prior to announcment.

From the rejection of the above hypothesis, and the negative coefficient of z in Model 1, we may also conclude that the sell-off is taken, by the market, as

signalling that the company's management is taking strong action to improve firm performance. For instance, the management may be selling-off loss making divisions. Such a decision would be regarded as a positive NPV decision.

7.4 RELATIVE SIZE AND FINANCIAL STRENGTH RELATIONSHIP

From our regressions, Model 1 and Model 3, we note that with the inclusion of both relative size and z-score in one regression the significance level of the z-score as an explanatory variable is reduced from 5% to 10%. This suggests some degree of collinearity between relative size and z-score. We have already found both z-score and relative size to be significant at 5% in separate regressions. The importance of each of these variables is plausible on the grounds explained. Logically, one would also expect a relatively large divestment in a financially distressed firm to produce positive abnormal returns by releasing the financial pressures on the firm on a significant scale.

Relatively large divestments in financially distressed firms would, therefore, be plausible. Such action would not only reduce the size of the company and thus make it more manageable but it would possibly provide substantial cash for the remaining part.

7.5 INTERACTION BETWEEN INDEPENDENT VARIABLES

Our choice of variables in the regression stems from the connection we expect between these variables and market reaction to sell-off announcement. However, we also expect following interactions between our independent variables:

i. Z-score and relative size (SIZE) might be negatively related since with high risk of potential bankruptcy more drastic measures will be needed to rescue the company. Thus a larger sell off might be required to generate sufficient cash for the parent.

ii. Intention/Completion (IC) and Price Disclosure (PRICE) could also be related as completion would only take place if an agreement on price is reached. If the price agreed is so low that it is regarded as bad news then it may not be disclosed along with the completion news. Such suspicion by the market is reflected in CAR's results for the Completion No-Price Group in Table 5.11 where negative abnormal returns are produced prior to and after day (-1). Day (-1) abnormal returns are only 0.25% and statistically insignificant. CAR's for days (0 to +5) are -2.68% and significant at the 1% level.

Fearing such a negative market reaction divestors may disclose the price on completion. In our sample of 92 completion announcements only 19 choose not to declare price. We could therefore expect a positive relation between Intention/Completion (IC) and Price Declaration (PRICE).

iii. Price Declaration (PRICE) and Relative Size (SIZE) may also be related as the importance of the price information for the market increases with the magnitude of sell-off. A small sell-off is expected to produce little market reaction and its price disclosure at the time of announcement may not be regarded as vital information. However, in our data compilation we have treated Price Declaration (PRICE) as a dummy variable and have calculated Relative Size (SIZE) for all sell-offs with price information.

iv. Z-score and Intention/Completion (IC) variables may be related. Companies with a high risk of bankruptcy may tend to announce their intention to divest before completion is reached as such an announcement would demonstrate their will to turn themselves around and thereby elecit a positive market reaction. On the other hand, in the absence of an agreed price and sales details the divestor may hesitate to make an intention announcement if it is felt that the market may react negatively to an unclear sell-off event.

7.6 POSSIBLE OMITTED VARIABLES

US sell-off studies have explored the impact of a number of variables on the magnitude of abnormal returns. Some of these variables that were omitted in our study and could be incorporated in future UK studies of sell-offs are noted here:

1. Identity of Buyer:

This variable has been studied by a number of researchers. Jain (1985) and Rosenfeld (1984) find significantly positive abnormal return gains accruing to buyers as well as sellers on announcement. Sicherman and Pettway (1987) find that the acquisition of related assets enhances the shareholder wealth of the acquiring firm. The acquisition of unrelated divested assets, however, affects shareholder wealth negatively.

Sicherman and Pettway (1992) confirm that buyers and sellers of divested assets earn positive abnormal returns on announcement of a divestiture. Furthermore they find that these gains are affected by seller's financial condition and by disclosure

of the transaction price. Seller's financial condition is measured by a variable called 'DOWNGRADE' which is equal to one if the divesting firm's credit rating has been downgraded prior to the sell-off announcement, and zero otherwise.

An additional variable called 'INTERACTION' is also introduced by Sicherman and Pettway (1992) as the product of 'PRICE' and 'DOWNGRADE' to capture the joint effect of downgraded sellers and transaction price disclosure. It was found that CAR's were greater for selling firms that did not have credit downgrades during the two years prior to announcing sell-offs, than for downgraded divestors. The wealth gains to the seller and buyer of divested assets may be better assessed if the identity of the buyer is noted and variables such as financial strength or downgrading are measured for the buyer and the seller and then incorporated in the same equation. Financial information on the buyer is important as financial strength can affect bargaining position in agreeing a price and consequently the level of abnormal returns to the divestor.

The way the abnormal return gains are shared between the same seller and buyer is also affected by their relatedness of activities, that is, if they are within the same industry and the way the deal has been justified. This issue is addressed under "Fit and Focus" further on in this section. Assessment of the identity of the buyer within the framework of financial strength and relatedness of industry may explain the size of abormal returns.

2. Use of Proceeds

Lang, Poulsen and Stulz (1993) argue that if management values firm size, or its diversification, one expects it to be reluctant to sell assets for efficiency alone. The need for cash can be a powerful incentive. In exploring the market reaction to divestor's use of funds, they investigate the abnormal return performance incident on announcement within sub-samples of sellers that have used the funds to repay debts to the claim holders and those that have retained the proceeds. They find that for a sample of large asset sales the stock-price reaction is significantly positive only for those firms that plan to pay out the proceeds to claimholders. Therefore use of proceeds would seem an appropriate variable to include in the analysis of abnormal returns in sell-off studies.

3. Agency costs

Management discretion in sell-offs and use of proceeds could cause a potential agency cost problem. However, Lang, Paulsen and Stulz (1993) do not find a direct link between abnormal returns and proxies for the agency cost of managerial discretion - such as decision to pay off the debts or keep the proceeds of divestment. On the other hand, Tehranian, Travlos and Waegelein (1987) demonstrate that only sell-offs by a divesting firm compensating its executives with a long term plan is associated with a favourable security market reaction (see page 58). It, therefore, seems that proxies for agency cost or elements that mitigate the agency problem, such as long term performance plan could justifiably be included among the variables explaining the size of abnormal returns incident on sell-off announcement.

4. Insider trading

It can be argued that management could be expected to purchase company shares prior to a sell-off announcement if positive market reaction is expected on announcement (See page 56). Hirschey and Zaima (1989) find that market reaction runs from very favourable for closely held firms with insider net-buy activity to neutral for widely held firms with insider net-sell activity prior to announcement. As such insider trading could be an additional variable in explaining market reaction to sell-offs.

5. Lenders and Bank Creditors.

Recent US and UK studies have explored the frequency and effectiveness of divestment in corporate financial distress. Brown, James and Mooradian (1991), point out that in their study of sell-offs by financially distressed firms, 37% of their sample firms that entered Chapter 11 sold assets prior to filing. Furthermore, only 20% of their sample firms successfully avoided bankruptcy through private debt restructuring. Similarly Asquith, Gertner and Scharfstein (1991) find that only 3 out of 21 companies in their sample that sell over 20% of their assets go bankrupt.

Lasfer, Sudarsanam and Taffler (1994) demonstrate that, on average, sell-offs by potentially bankrupt firms experience significantly higher abnormal returns on announcement than do healthy firms. Furthermore, they find that these positive abnormal returns are significantly related to the divestors levels of debt. Potentially bankrupt firms with high levels of debt experience larger abnormal returns than

similar companies with low levels of debt over the event days (-1 to 0). They suggest that such high abnormal returns point to the effective monitoring of managerial decisions by lenders.

Similarly, Hirschey et al (1990) argue that the presence of bank debt adds credibility to management's divestment decision by increasing the probability that proceeds will exceed the NPV of continued ownership of the divested asset by the divestor. In other words, lender's influence is seen to reduce agency cost.

In view of the above studies one would be inclined to suggest that the level of bank lending can be added as an explanatory variable to our regressions of abnormal returns against various independent variables.

6. Fit and Focus

One of the concepts that has been developed to explain the abnormal return performance on announcement is 'fit or focus'. The divested asset may have a better strategic fit with the buyer's business than with the seller's. Thus with the sell off, the asset will be put to a higher valued use. The resulting added value can then be shared between the seller and buyer. Divestment may also reduce the negative synergy that the divested asset has contributed to the divestor's business thereby increasing the strategic and operational focus of the remaining business. Explanations offered for positive market reaction to sell-off announcement by Alexander et al (1984) and Hite et al (1987) are along this line. That is, a sell-off implies a better fit for the buyer. Comment and Jarrell (1992), Bhagat, Shleifer and Vishny (1990), and Lang and Stulz (1992) suggest that gains in market value stem from increased focus on remaining assets.

John and Ofek (1992) aim to find the share of abnormal return gains from 'fit' and 'focus' elements individually. They identify firms that fall into either of fit or focus category and find support for the notion that gains can stem from better 'fit' or 'focus'. Such findings suggest that proxies for 'fit' and 'focus' can be incorporated in our regression models and may help to explain market reaction to sell-offs.

7.7 CONSISTENCY OF HYPIOTHESIS

With reference to the consistensy of our five hypotheses the following explanations would seem justified at this point.

The first hypothesis is about the stock market reaction to divestment announcements in general whereas the remaining four hypotheses are concerned with the impact of additional information characterising divestors and the divestment process on such reaction.

Hypothesis 2 and Hypothesis 4 are about how price disclosure and the consequent estimation of the relative size of divestment condition market reaction. Such disclosure may accompany other information e.g. mere intention to divest or completion of divestment. The impact of the latter is the subject of our Hypothesis 3. Finally, the stock market may read information about price, relative size, intention or completion in conjunction with information about the financial condition of the divestor. The impact of the latter is the subject of our Hypothesis 5.

Our Hypotheses 2 to 5 are not mutually inconsistent since they relate to different attributes of the divestment process all of which can co-exist. However, market

reaction to divestments may be determined by these attributes in an interactive, rather than a linear additive, fashion. For example, assuming that divestment by financially distressed firms will be favourably received by the stock market, we may expect that the larger the relative size of divestment the more favourable the market reaction. Similarly, price disclosure and completion/intention, or financial distress and completion/intention may have an interactive effect on market reaction.

The interactive effects of price disclosure and completion/intention are explored in detail by stratifying our sample into different subsamples:

Intention with price disclosed;
Intention without price disclosure;
Completion with price disclosed;
Completion without price disclosure.

We also examine whether, within the same subsample of price declarers, there is differential market reaction to divestors announcing intention or completion. This analysis is repeated for the subsample of all non-price declarers. A similar analysis is carried out by grouping all divestors who announce only intention but differ in terms of price declaration. Grouping all divestors who announce completion but differ in terms of price disclosure is also explored. Investigation of the market reaction in these sub-samples sheds light on the interaction between price information and information about the certainty of the divestment process.

The interaction between price declaration, relative size or intention/completion with divestor financial condition is examined in our regression models by including the relevant interactive terms. However no statistically significant relationship is found

between any of these interactive terms. The following interactive terms, i.e. product of two variables, are introduced into the regression model in addition to the three explanatory variables in Model 3, Table 7.2 : (1) The interaction between Financial Strength (z-score) and Intention/Completion (IC), (2) interaction between Relative Size (Size) and Intention/Completion (IC), and (3) the interaction between Financial Strenght (z-score) and Relative Size (Size). However, none of the interactive terms except IC x R is significant. R is insignificant compared to its marginal significance at t = 1.62 in Model 3. The adjusted R^2 of 5.3% represents a small improvement. When the event day abnormal return is regressed against the first two variables z-score and Size x IC, the z-score is negatively significant at 10% level (t = 1.66) and (IC x Size) is significant at 1% level (t = 2.86) - the adjusted R^2 is 7.5%. These results suggest that the impact of the z-score and Relative Size is to some extent modified by the accompanying information about completion and intention.

7.8 REVIEW OF RESULTS

In Chapter 5 we found the magnitude and significance of abnormal returns on announcement day for various sub-samples of U.K. sell-offs are larger for sub-samples of price-declared and completion announcements. These findings shed light on the importance of certainty afforded by price and completion announcements.

Chapter 6 examined the effect of changes of methodology on our results, namely, methodology for calculation of beta and return generating models. The choice of methodology seemed to affect the magnitude of our results but not their general direction.

In Chapter 7 we aimed to identify the possible variables that explain the size of already measured abnormal returns on announcement. Relative size and z-score appeared significant at the 5% level if regressed in separate models against abnormal returns. However, if both relative size and z-score were regressed against abnormal returns in the same model the significance of these variables would reduce to around the 10% level.

Our investigation of multicollinearity does not alter our earlier results and interpretations.

Chapter 8 : SUMMARY AND CONCLUSION

8.1 GENERAL RESULTS

This study explores a number of issues relating to corporate divestment activity in the UK in the light of various competing theories. We find firstly that sell-offs in aggregate are associated with an increase in shareholder wealth of 0.85% on the event day although pre- and post-market reaction is conflicting. Unlike the majority of US-based studies we find no significant excess returns accruing to stockholders in the 81 trading day period surrounding the announcement date, although differences in sample selection criteria may be partly the reason. However, these broad empirical results appear to mask the important contribution of underlying sub-sample characteristics that may serve to augment our understanding of the contingent nature of market reaction to the corporate divestment process.

Transaction price may well be an important piece of information used in assessing the impact of the sell-off on a divestor with consequent shareholder wealth implications. Also, whether the first announcement of the sell-off relates to a signed agreement or not seems to influence market reaction. Size of the divestment relative to the size of parent may also be an important determinant of investors' perceptions. In addition, the financial health of the divestor immediately prior to the sell-off may shape the market's interpretation of the motivation and exigency of the firm's divestment decision and condition the consequent market reaction. Our more detailed findings may be summarised as follows.

8.2 STOCK MARKET REACTION TO PRICE ANNOUNCEMENT

One in five of our sample companies does not declare price on sell-off announcement and we find a significant difference in abnormal returns between price declarers and non-price declarers. In fact, there is no apparent stock market reaction on event day to sell-off announcements by firms not providing price information. However, over a longer interval surrounding the announcement (-10 to +10 days), we find some statistical evidence of positive revaluation in the case of price declarers and the converse in the case of price non-declarers. The actual price disclosure decision would appear to convey market relevant information.

8.3 STOCK MARKET REACTION TO STATUS OF DIVESTITURE

Just over half our sample relates to divestments which have been completed, whereas in the other cases only the intention to dispose of operating assets to a named third party is announced. In the latter case uncertainty about final consummation of the deal and presumably the price may be substantial. As such we would expect abnormal returns for the Completion sample to be higher than those for the Intention only sample of firms and such expectations are confirmed on the event day by our results, but not for other periods. It would appear that the degree of certainty attached to the sell-off announcement has relevance for the market pricing of the divestor.

8.4 INTERACTION BETWEEN PRICE DISCLOSURE AND STATUS OF DIVESTITURE ANNOUNCEMENT

To explore the interaction between price/no-price disclosure and completion/intention, market price response to divestiture announcement for each of four sub-samples is examined. Overall the Completion sample with price information disclosed earns a significantly larger event day average excess return than the equivalent Intention-Price sample. The two small, No-Price samples exhibit minimal event day reaction. The Completion-No price group under-performs every other sub-group, thus emphasising the importance of price disclosure.

8.5 THE IMPACT OF FINANCIAL STRENGTH OF THE DIVESTOR ON MARKET REACTION

Little detailed attention has been paid to date in the literature to the "bankruptcy avoidance" motive for corporate sell-offs, an issue of interest both for theoretical and for empirical reasons. To examine the hypothesis that firms may divest in order to avoid bankruptcy, we employ the z-score measure of bankruptcy risk derived from a firm's published accounts. If an enterprise's z-score is negative it has financial characteristics similar to those of previously failed firms and itself is at risk of failure. If it is positive there is no immediate concern over its financial health. Regressing event day abnormal return against z-score and Completion/Intention and Price/No-Price dummies shows the z-score, with a negative sign, to be significant at the 5% level but neither of the other two variables significant. This suggests that the financial health of the divestor is negatively related to the excess return earned by stockholders incident on the sell-off

announcement. This empirical finding may be consistent with the bankruptcy avoidance motive or "good news" argument about management actions and future performance.

8.6 RELATIVE SIZE OF SELL-OFF AND SHAREHOLDER WEALTH

The ratio of size of divestment to size of parent, providing a measure of the economic significance of the proposed sell-off, may also be an important predictor of market reaction to a sell-off announcement. To explore this issue event day abnormal return is regressed against a relative size binary variable and the completion/intention dummy. We find relative size, with positive coefficient, to be significant at the 5% level, but the other variable non-significant. There is thus evidence supportive of the argument that the larger the disposal, the greater the increase in shareholder wealth.

8.7 IMPACT OF ALTERNATIVE METHODOLOGIES

Choice of the Scholes and Williams method for correcting for thin trading bias in market model estimates compared with the Dimson method does not alter the thrust of our results. The results from using betas without any correction for thin trading in general are closer to those from the use of market adjusted betas. Using abnormal returns based on the assumption of cross-sectional independence reduces the significance, but does not alter the direction, of our results obtained under the dependence assumption.

It is interesting to conclude that although there are variations in the magnitude of abnormal returns and t-statistics, when applying different methodologies, the

direction of the results is the same. Furthermore, as far as day (-1) results are concerned, all of the prediction models, irrespective of dependence/independence assumption and methodology for treatment of thin trading, produce abnormal returns significant at the 1% level. This finding should provide some comfort to researchers in sell-off studies concerned about the robustness of their results to differences in methodology.

8.8 COMPARISON OF RESULTS WITH OTHER STUDIES

This study concentrates on sell-offs only. The overall results are in harmony with other studies reviewed in Chapter 3 (e.g. Jain, 1985; Zaima and Hearth, 1985; Hite and Owers, 1987; Hearth and Zaima, 1984 and 1986; and Klein, 1986). That is, statistically positive abnormal returns are detected on or around the announcement day for the overall sample. Our results for the sub-sample of Intention only firms are in line with Alexander et al (1984)'s overall results.

As with Klein (1986), we find that price declaration on announcement has a statistically significant impact on magnitude of abnormal returns produced (see Section 5.5). The impact of the announcement of a completed sell-off is explored by comparing the results for initial announcement of intention with that of completion. Completion announcement is found to produce a statistically significant impact on abnormal returns on announcement day (-1), (see Section 5.7) but not the intention announcement. Neither Klein (1986) nor Zaima and Hearth (1985) undertake such analysis. Klein (1986) examines whether price declaration is used as a proxy for the probability of the deal reaching completion. Zaima and Hearth (1985) study the movements of abnormal returns between initial announcement and subsequent completion.

We also explore the impact of relative size of divestiture on the excess returns and find larger sell-offs produce larger abnormal returns. Our study of relative size confirms the findings of Klein (1986) and Zaima and Hearth (1985).

Financial strength has not been studied in the same manner as it has been by Zaima and Hearth (1985), where the relation between abnormal returns and current strength of divestor, as measured by the Standard Poor's rating, is found to be positive, thus demonstrating advantages to those divesting from a strong financial position. We use the more appropriate z-score measure of bankruptcy risk and our regression analysis suggests higher abnormal returns are enjoyed by divestors with high risk of bankruptcy assessed on this basis. Sicherman and Pettway (1987) do not study the abnormal return to divestors with strong and weak financial positions directly. They explore the relationship between the worsening of the financial condition of the divestor, and thus a potential weakening in its negotiation position, and the gains earned by the acquiring firm using downgrading by Moody's and/or Standard Poor's within two years of the divestiture announcement. Their results were insignificant. They do, however, find that 42 out of their 147 divestors were downgraded by Moody's and/or Standard and Poor's Investment Services during the two years prior to announcement. This downgrading, which was not reversed before the announcement, was considered a signal of worsening in the firm's financial condition. Our results also confirm that the market has regarded divestiture as a good solution to the worsening in the firms' divesting financial position.

Several issues studied by previous researches (see Chapter 3) have not been examined in this study, such as: insider trading and ownership structure (Hirschey and Zaima 1989), long term performance plans (Tehranian et al, 1987), management motives (Denning, 1987), confounding effects (Denning and Shastri, 1990), and

factors influencing the divestment decision (Duhaime and Grant, 1984). However, the results reported in this study are more detailed in terms of sub-samples of price declaration and completion announcements, choices of prediction models, thin trading treatment and dependence and independence assumptions for statistical tests of significance (see Chapters 5, 6 and 7). In addition an explicit test of the bankruptcy avoidance hypothesis is made.

8.8.1 LIMITATIONS OF THIS STUDY

This study concentrates on studying abnormal returns on divestment announcement within sub-samples of price declared and/or completion declared as well as our over all sample. Our examination attempts to explore the impact of price and completion information on the market reaction. We also evaluate the impact of relative size of divestment and financial strength (measured by Z-score) on the magnitude of abnormal returns. These factors have appeared important in explaining the level of abnormal returns.

Our study although forming a sound basis for future studies of U.K. sell-offs is limited in many respects. Some of the questions which have not been addressed in our study but have already been raised and examined within U.S. sell-offs studies are outlined below:

i. What factors influence the divestment decision? For instance: Do parents divest a division that is underperforming its budgetted targets (unit strength)? Do parents choose to divest divisions that are less dependent upon other divisions in their firms (unit interdependence)? Do managers tend to divest divisions that

they have less personal attachment to (managerial attachment)? Do the general economic conditions have any impact on the parent 's choice of divestment? These factors are studied by Duhaime and Grant (1984) for U.S. firms.

ii. Can management motives for divestment affect the magnitude of abnormal returns? For instance, has the divestment taken place to make the overall parent more manageable or was it intended to rescue the parent from financial crisis. Six management motives have been studied by Denning (1988), see Chapter 3, p.58.

iii. Will the market react more positively to divestments made by managers whose salary and rewards are linked to the long term profitibility of the parent? Tehranian et al (1987) study the impact of long term performance plans on abnormal returns and suggest that firms with long term performance plans do attract positive abnormal returns on announcement of divestments.
Conversely, divesting firms that do not compensate their executives with long term performance plans experience an insignificant negative stock market reaction at the announcement of their sell-off proposals. These findings provide support for the hypothesis that long-term performance plans provide important incentives that can reduce agency costs by improving the alignment of managers' and stockholders' interests.

iv. Will the market respond more favourably to divestments by firms whose managers hold some shares and have made further purchases recently? The impact of insider trading on sell-off announcement has been examined by Hirschey and Zaima(1989). See page 56 Section 3.5.

v. Does the use of proceeds effect abnormal return. See Section 7.6-2.

iv. Is the degree of debt related to the level of abnormal returns? Lasfer, Sudarsanam and Taffler (1994) demonstrate such positive relation using the data base of this study.

vii. How much of the market's positive reaction can be attributed to fit or focus element? See Section 7.6 - 6.

viii. Our sample in this study was restricted to a two year period, 1985 to 1986. Will a study over a longer time period confirm similar findings?

8.9 CONTRIBUTIONS TO THE FIELD

The areas in which this thesis has attempted to contribute to the field of corporate divestments research can be outlined briefly as follows:

1- UK sell-off experience is studied for the first time using similar criteria and methodology to those employed in US studies and comparative results evaluated. The construction of UK-based daily abnormal return data proved to be a major task. Such data is readily available to US researchers.

2- The impact of different methodologies is analysed for the first time in a sell-off study to allow for variation in :

   a) the choice of methods for correcting for the thin trading bias in the traditional market model,

   b) the choice of return generating process,

   c) the choice of models with cross-sectional dependence as well as independence among the residuals.

3- Abnormal returns are calculated for various sub-groups of firms classified on various criteria to explore differences in market reaction to each sub-group. Such analysis has shed light on some differences in the results reported by other studies. Alexander et al's (1984) results, which are contrary to those of most other sell-off studies, are similar to the results obtained from our Intention sub-sample. Our results for the whole sample are, at the same time, in harmony with those of other sell-off studies. Alexander et al (1984) do specify that their sample is made up of first announcements of 'sell-offs' of either "greed to sell" or "agreed in principle". Such a definition is the same as our definition of intention sub-sample. We would like to highlight this definition and sample characteristics as the reason for the compatibility of Alexander et al's (1983) finding, with those of other studies. We would also suggest that the differences in abnormal return magnitude and distribution pattern over an observation period may be a function of the idiosyncratic sample characteristics.

4- The impact of price announcement and completion announcement is studied for various sub-groups as well as the entire sample.

5- The impact of complete certainty on stock market valuation is assessed for the first time by comparing sub-samples of Completion Price and Intention - No Price sell-offs. This, we believe, gives a clearer picture of the market impact of information on sell-offs.

6- Z-score is employed as a means of assessing financial strength and support is found for the postulated bankruptcy avoidance motive for corporate divestments.

8.10 DIRECTIONS FOR FUTURE RESEARCH.

8.10.1 MOTIVES FOR PRICE DISCLOSURE AND COMPLETION ANNOUNCEMENT.

An area that seems to warrant further research is the area of the economic and managerial motives for :

a) declaring or not declaring the price on announcement,

b) delaying the announcement of divestment until reaching completion.

8.10.2 FACTORS INFLUENCING THE DIVESTMENT DECISION IN THE UK

It would seem appropriate to conduct a UK based research study similar to that of Duhaime and Grant (1984) in the US. Such a study would examine the factors that induce a sell-off and its characteristics. Such factors might include: financial status of divestor, inter-dependency among the divisional units of the divestor, including the divested part, managerial attachment to a divested unit and the general economic conditions ruling at the time of divestment.

8.10.3 LONG TERM PERFORMANCE PLANS.

A UK based research along the lines of Tehranian et al (1987) might also demonstrate the impact of the existence of long term performance plans within the parent on abnormal returns earned on announcement of divestment.

8.10.4 FINANCIAL STATUS

This study finds a significant relationship between financial distress, measured by the z-score, and gains to shareholders following sell-off

announcement. Given that the need for cash seems to be one of the causes of divestment, it would seem appropriate to study market reaction to financially distressed firms in isolation from financially healthy firms. Such a study would throw light on shareholder gains due to avoidance of direct and indirect costs associated with bankruptcy or financial distress.

8.10.5 EFFECT OF MOTIVATION

Motivations behind divestment are shown to affect the magnitude of abnormal returns produced according to Denning (1988) as explained in Chapter 3. Divestment could be a solution to a financial crisis, agency cost problem or financial under performance. Market reactions to different motivations behind sell-offs in the U.K. would provide further insight into the nature of abnormal returns on announcement date.

8.10.6 EFFECT ON ACQUIRERS

As explained in Section 7.6-1, it would be appropriate to conduct a study of the impact on the share price performance of the acquirers of U.K. sell-offs. This would then bring U.K. studies of divestments more in line with U.S. studies such as Rosenfeld (1984), Hite et al (1987), and Jain (1985) and Sicherman and Pettway (1987). Movements in abnormal returns (if any) of the acquiring party over the announcement period would be of interest. Relative financial strength and bargaining power of the acquirer may also be of interest.

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APPENDIX

LIST OF TABLES

A.1 DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: DIMSON VERSUS SCHOLES & WILLIAMS METHOD VERSUS UNADJUSTED BETAS - DEPENDENT ASSUMPTION.

A.2 T-TESTS OVER DIFFERENT RANGES OF DAYS: DIMSON VERSUS SCHOLES & WILLIAMS METHOD VERSUS UNADJUSTED BETAS - DEPENDENT ASSUMPTION.

A.3 DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: PRICE GROUP VERSUS NO-PRICE GROUP - DEPENDENT ASSUMPTION.

A.4 DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: COMPLETION GROUP VERSUS INTENTION GROUP - DEPENDENT ASSUMPTION.

A.5 DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: DEPENDENT VERSUS INDEPENDENT ASSUMPTION.

A.6 T-TESTS OVER DIFFERENT RANGES OF DAYS: DEPENDENT VERSUS INDEPENDENT ASSUMPTION.

A.7 DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: CAPM VERSUS MARKET MODEL VERSUS MARKET ADJUSTED BETAS (BETA = 1).

TABLE A.1 - DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: DIMSON VERSUS SCHOLES & WILLIAMS METHOD VERSUS UNADJUSTED BETAS -DEPENDENT ASSUMPTION.

DIMSON METHOD (N=178)			SCHOLES & WILLIAMS METHOD (N=178)			UNADJUSTED BETAS (N=178)		
DAY	%AR	%CAR	DAY	%AR	%CAR	DAY	%AR	%CAR
-40	-0.0882	-0.0882	-40	-0.0817	-0.0817	-40	-0.0562	-0.0562
-39	0.0401	-0.0481	-39	0.0316	-0.0501	-39	0.0270	-0.0292
-38	-0.1806	-0.2287	-38	-0.1761	-0.2262	-38	-0.1688	-0.1980
-37	0.0432	-0.1855	-37	0.0023	-0.2239	-37	-0.0384	-0.2364
-36	0.1944	0.0090	-36	0.1295	-0.0944	-36	0.1528	-0.0836
-35	0.2319	0.2409	-35	0.1853	0.0909	-35	0.1910	0.1074
-34	-0.1082	0.1326	-34	-0.1507	-0.0598	-34	-0.1592	-0.0518
-33	-0.1528	-0.0202	-33	-0.1425	-0.2023	-33	-0.1629	-0.2147
-32	-0.1585	-0.1787	-32	-0.1501	-0.3524	-32	-0.1646	-0.3793
-31	-0.0751	-0.2538	-31	-0.0551	-0.4075	-31	-0.0368	-0.4161
-30	-0.0276	-0.2814	-30	-0.0753	-0.4828	-30	-0.0872	-0.5034
-29	0.1614	-0.1200	-29	0.2087	-0.2741	-29	0.2528	-0.2506
-28	0.1887	0.0687	-28	0.1351	-0.1390	-28	0.1200	-0.1306
-27	0.0469	0.1157	-27	0.0449	-0.0940	-27	0.0462	-0.0844
-26	0.1267	0.2423	-26	0.0833	-0.0107	-26	0.1020	0.0176
-25	-0.2925	-0.0502	-25	-0.2972	-0.3079	-25	-0.2753	-0.2577
-24	0.0817	0.0315	-24	0.0650	-0.2429	-24	0.0829	-0.1748
-23	-0.0003	0.0313	-23	-0.0016	-0.2444	-23	-0.0190	-0.1939
-22	-0.3306	-0.2993	-22	-0.3779	-0.6224	-22	-0.3697	-0.5635
-21	-0.0144	-0.3137	-21	-0.0854	-0.7078	-21	-0.0654	-0.6289
-20	-0.2602	-0.5740	-20	-0.2125	-0.9204	-20	-0.1909	-0.8198
-19	0.1896	-0.3844	-19	0.1220	-0.7983	-19	0.1155	-0.7043
-18	-0.2899	-0.6743	-18	-0.2446	-1.0430	-18	-0.2381	-0.9424
-17	0.2789	-0.3954	-17	0.2771	-0.7659	-17	0.2844	-0.6580
-16	-0.1975	-0.5930	-16	-0.1739	-0.9397	-16	-0.1867	-0.8446
-15	-0.1976	-0.7906	-15	-0.1497	-1.0894	-15	-0.1657	-1.0103
-14	0.0459	-0.7447	-14	0.0532	-1.0362	-14	0.0550	-0.9553
-13	0.0378	-0.7068	-13	-0.0149	-1.0511	-13	-0.0303	-0.9856
-12	0.0532	-0.6536	-12	0.0481	-1.0030	-12	0.0408	-0.9448
-11	-0.2731	-0.9267	-11	-0.2639	-1.2669	-11	-0.2582	-1.2030
-10	0.0708	-0.8558	-10	0.0384	-1.2286	-10	0.0370	-1.1660
-9	0.4810	-0.3749	-9	0.4975	-0.7310	-9	0.5250	-0.6411
-8	0.0722	-0.3027	-8	0.0835	-0.6476	-8	0.0844	-0.5566
-7	-0.0386	-0.3413	-7	-0.0328	-0.6803	-7	-0.0094	-0.5660
-6	0.0286	-0.3127	-6	0.0451	-0.6352	-6	0.0717	-0.4943
-5	-0.0803	-0.3930	-5	-0.0881	-0.7234	-5	-0.0974	-0.5917
-4	0.0868	-0.3062	-4	0.0765	-0.6469	-4	0.0863	-0.5055
-3	0.2868	-0.0194	-3	0.3191	-0.3278	-3	0.3376	-0.1679
-2	0.0325	0.0132	-2	0.0146	-0.3132	-2	0.0185	-0.1494
-1	0.8539	0.8671	-1	0.8080	0.4948	-1	0.7865	0.6372
0	-0.2026	0.6645	0	-0.2391	0.2558	0	-0.2651	0.3721
1	-0.2285	0.4360	1	-0.1963	0.0594	1	-0.1635	0.2086
2	-0.2617	0.1743	2	-0.2748	-0.2154	2	-0.2591	-0.0505

3	-0.1517	0.0226	3	-0.1676	-0.3830	3	-0.1556	-0.2061
4	-0.1985	-0.1759	4	-0.1609	-0.5439	4	-0.1707	-0.3768
5	-0.1520	-0.3279	5	-0.1619	-0.7057	5	-0.1667	-0.5434
6	-0.0559	-0.3838	6	-0.0958	-0.8015	6	-0.0916	-0.6350
7	0.2311	-0.1526	7	0.2054	-0.5962	7	0.1855	-0.4496
8	0.2705	0.1178	8	0.2645	-0.3317	8	0.2528	-0.1967
9	0.0768	0.1947	9	0.0351	-0.2966	9	0.0345	-0.1623
10	-0.2644	-0.0698	10	-0.2986	-0.5951	10	-0.3185	-0.4807
11	-0.0361	-0.1059	11	-0.0196	-0.6147	11	-0.0309	-0.5116
12	-0.2560	-0.3619	12	-0.2578	-0.8724	12	-0.2216	-0.7332
13	-0.1113	-0.4732	13	-0.0773	-0.9497	13	-0.0680	-0.8012
14	0.1215	-0.3517	14	0.1600	-0.7897	14	0.1836	-0.6176
15	0.0295	-0.3222	15	0.0445	-0.7452	15	0.0710	-0.5466
16	0.1040	-0.2182	16	0.1059	-0.6393	16	0.1139	-0.4327
17	-0.0001	-0.2183	17	0.0035	-0.6358	17	0.0417	-0.3910
18	0.0234	-0.1949	18	-0.0363	-0.6721	18	-0.0106	-0.4016
19	0.1168	-0.0781	19	0.1049	-0.5672	19	0.1219	-0.2798
20	0.0893	0.0112	20	0.0928	-0.4744	20	0.0883	-0.1914
21	0.0256	0.0368	21	-0.0103	-0.4847	21	-0.0185	-0.2099
22	0.4242	0.4610	22	0.4201	-0.0646	22	0.4518	0.2418
23	-0.0246	0.4364	23	-0.0331	-0.0977	23	-0.0120	0.2298
24	0.1223	0.5587	24	0.1197	0.0220	24	0.1642	0.3940
25	0.0112	0.5699	25	0.0339	0.0559	25	0.0802	0.4742
26	0.1214	0.6913	26	0.1340	0.1899	26	0.1784	0.6526
27	0.1928	0.8840	27	0.1757	0.3656	27	0.2238	0.8764
28	-0.1757	0.7083	28	-0.2300	0.1355	28	-0.2158	0.6606
29	0.1795	0.8878	29	0.1563	0.2919	29	0.1604	0.8211
30	-0.0984	0.7893	30	-0.1051	0.1867	30	-0.0728	0.7482
31	0.1190	0.9084	31	0.1230	0.3098	31	0.1173	0.8656
32	-0.2578	0.6505	32	-0.2305	0.0792	32	-0.2100	0.6556
33	-0.0319	0.6186	33	-0.0045	0.0747	33	0.0044	0.6600
34	-0.3223	0.2963	34	-0.2909	-0.2162	34	-0.2410	0.4190
35	-0.1368	0.1595	35	-0.1528	-0.3690	35	-0.1370	0.2820
36	-0.2351	-0.0756	36	-0.2248	-0.5938	36	-0.2237	0.0583
37	0.2432	0.1676	37	0.2358	-0.3579	37	0.2329	0.2912
38	-0.0514	0.1162	38	-0.0629	-0.4208	38	-0.0270	0.2641
39	0.0878	0.2040	39	0.0805	-0.3403	39	0.1210	0.3851
40	0.0384	0.2424	40	0.0331	-0.3072	40	0.0395	0.4247

TABLE A.2 - T-TESTS OVER DIFFERENT RANGES OF DAYS:
DIMSON VERSUS SCHOLES & WILLIAMS METHOD VERSUS UNADJUSTED BETAS
-DEPENDENT ASSUMPTION.

DIMSON METHOD (N=178)			SCHOLES & WILLIAMS METHOD (N=178)			UNADJUSTED BETAS (N=178)		
Range		T-Test	Range		T-Test	Range		T-Test
from	to		from	to		from	to	
-40	40	0.1650	-40	40	-0.2102	-40	40	0.2939
-30	30	0.8182	-30	30	0.4684	-30	30	0.9287
-20	20	0.3109	-20	20	0.2244	-20	20	0.4257
-10	10	1.1455	-10	10	0.9026	-10	10	0.9819
-5	5	-0.0281	-5	5	-0.1309	-5	5	-0.0922
-4	4	0.4433	-4	4	0.3683	-4	4	0.4464
-3	3	0.7612	-3	3	0.6141	-3	3	0.7049
-2	2	0.5305	-2	2	0.3095	-2	2	0.3270
-2	-1	3.8400	-2	-1	3.5813	-2	-1	3.5462
-1	-1	5.2314	-1	-1	4.9748	-1	-1	4.8999
-1	0	2.8214	-1	0	2.4769	-1	0	2.2971
-1	1	1.4954	-1	1	1.3245	-1	1	1.2875
0	0	-1.2413	0	0	-1.4720	0	0	-1.6514
-2	0	2.4187	-2	0	2.0743	-2	0	1.9420
-2	1	1.3947	-2	1	1.1920	-2	1	1.1726
-3	0	2.9732	-3	0	2.7788	-3	0	2.7334
-3	1	2.0332	-3	1	1.9449	-3	1	1.9893
-3	2	1.2016	-3	2	1.0847	-3	2	1.1571
-4	0	2.8971	-4	0	2.6960	-4	0	2.6851
-4	1	2.0732	-4	1	1.9677	-4	1	2.0354
-4	2	1.3135	-4	2	1.1822	-4	2	1.2744
-4	3	0.9000	-4	3	0.7409	-4	3	0.8494
-5	0	2.4439	-5	0	2.2396	-5	0	2.2036
-5	1	1.7335	-5	1	1.6166	-5	1	1.6551
-5	2	1.0548	-5	2	0.9139	-5	2	0.9776
-5	3	0.6846	-5	3	0.5176	-5	3	0.5986
-5	4	0.2650	-5	4	0.1778	-5	4	0.2317
-7	-1	2.7086	-7	-1	2.6585	-7	-1	2.8109
-6	-1	3.0222	-6	-1	2.9539	-6	-1	3.0600
-5	-1	3.2323	-5	-1	3.1116	-5	-1	3.1524
-4	-1	3.8597	-4	-1	3.7502	-4	-1	3.8278
-3	-1	4.1498	-3	-1	4.0586	-3	-1	4.1097
-2	-1	3.8400	-2	-1	3.5813	-2	-1	3.5462
-1	-1	5.2314	-1	-1	4.9748	-1	-1	4.8999
-7	0	2.0948	-7	0	1.9664	-7	0	2.0455
-6	0	2.3288	-6	0	2.1784	-6	0	2.2088
-5	0	2.4439	-5	0	2.2396	-5	0	2.2036
-4	0	2.8971	-4	0	2.6960	-4	0	2.6851
-3	0	2.9732	-3	0	2.7788	-3	0	2.7334
-2	0	2.4187	-2	0	2.0743	-2	0	1.9420
-1	0	2.8214	-1	0	2.4769	-1	0	2.2971
0	0	-1.2413	0	0	-1.4720	0	0	-1.6514

0	5	-2.9887	0	5	-3.0178	0	5	-3.0026
0	10	-1.7305	0	10	-2.0234	0	10	-2.0998
0	15	-1.8215	0	15	-1.9087	0	15	-1.8436
0	20	-1.1442	0	20	-1.3023	0	20	-1.1264
0	30	-0.0856	0	30	-0.3407	0	30	0.1243
0	40	-0.5977	0	40	-0.7712	0	40	-0.2067

TABLE A.3 - DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: PRICE GROUP VERSUS NO-PRICE GROUP -DEPENDENT ASSUMPTION.

PRICE GROUP (N=142)			NO-PRICE GROUP (N=36)		
DAY	%AR	%CAR	DAY	%AR	%CAR
-40	-0.1639	-0.1639	-40	0.2106	0.2106
-39	0.0446	-0.1193	-39	0.0211	0.2317
-38	-0.2015	-0.3209	-38	-0.0965	0.1353
-37	0.0470	-0.2739	-37	0.0299	0.1652
-36	0.1263	-0.1476	-36	0.4623	0.6275
-35	0.2276	0.0800	-35	0.2472	0.8747
-34	-0.1118	-0.0318	-34	-0.0921	0.7826
-33	-0.1716	-0.2034	-33	-0.0802	0.7024
-32	-0.0904	-0.2938	-32	-0.4278	0.2746
-31	-0.0418	-0.3356	-31	-0.2057	0.0689
-30	-0.0492	-0.3848	-30	0.0272	0.0961
-29	0.2482	-0.1366	-29	-0.1524	-0.0563
-28	0.3108	0.1742	-28	-0.2948	-0.3511
-27	0.0760	0.2502	-27	-0.0678	-0.4189
-26	0.1088	0.3590	-26	0.1976	-0.2212
-25	-0.4133	-0.0542	-25	0.1836	-0.0377
-24	0.1198	0.0656	-24	-0.0697	-0.1073
-23	-0.2808	-0.2153	-23	1.1069	0.9996
-22	-0.3784	-0.5936	-22	-0.1403	0.8592
-21	-0.0531	-0.6467	-21	0.1415	1.0007
-20	-0.3467	-0.9934	-20	0.0848	1.0854
-19	0.2133	-0.7801	-19	0.0961	1.1816
-18	-0.3524	-1.1325	-18	-0.0429	1.1387
-17	0.2590	-0.8734	-17	0.3611	1.4998
-16	-0.2024	-1.0759	-16	-0.1802	1.3196
-15	-0.1916	-1.2675	-15	-0.2229	1.0968
-14	0.0538	-1.2137	-14	-0.0435	1.0532
-13	0.0658	-1.1479	-13	-0.0132	1.0400
-12	0.0287	-1.1192	-12	0.1504	1.1904
-11	-0.3562	-1.4754	-11	0.0512	1.2415
-10	0.0860	-1.3894	-10	0.0133	1.2548
-9	0.5996	-0.7898	-9	0.0124	1.2672
-8	0.2514	-0.5384	-8	-0.6362	0.6310
-7	0.0335	-0.5049	-7	-0.3266	0.3044
-6	0.0538	-0.4511	-6	-0.0709	0.2336
-5	0.1386	-0.3125	-5	-0.9454	-0.7119
-4	0.1791	-0.1335	-4	-0.2776	-0.9895
-3	0.2691	0.1357	-3	0.3565	-0.6330
-2	0.0970	0.2327	-2	-0.2228	-0.8558
-1	1.0561	1.2887	-1	0.0576	-0.7982
0	-0.1811	1.1077	0	-0.2886	-1.0868
1	-0.4068	0.7009	1	0.4731	-0.6137
2	-0.2251	0.4757	2	-0.4333	-1.0471

3	-0.0124	0.4633	3	-0.6746	-1.7217
4	-0.0398	0.4235	4	-0.8262	-2.5479
5	-0.3827	0.0408	5	0.7576	-1.7903
6	-0.0483	-0.0075	6	-0.1528	-1.9431
7	0.2778	0.2703	7	0.1131	-1.8300
8	0.2986	0.5690	8	0.1561	-1.6739
9	0.1457	0.7146	9	-0.1949	-1.8688
10	-0.2085	0.5062	10	-0.4855	-2.3544
11	-0.0897	0.4165	11	0.1711	-2.1833
12	-0.1450	0.2715	12	-0.6953	-2.8786
13	0.0337	0.3051	13	-0.6808	-3.5593
14	0.1426	0.4477	14	0.0163	-3.5431
15	0.0258	0.4736	15	0.0638	-3.4793
16	0.1101	0.5836	16	0.0815	-3.3977
17	0.0717	0.6553	17	-0.2812	-3.6789
18	-0.0059	0.6494	18	0.1374	-3.5415
19	0.2555	0.9048	19	-0.4323	-3.9738
20	0.1717	1.0766	20	-0.2365	-4.2104
21	0.1186	1.1952	21	-0.3425	-4.5529
22	0.2395	1.4347	22	1.0369	-3.5160
23	0.0111	1.4458	23	-0.0542	-3.5702
24	0.0780	1.5238	24	0.2941	-3.2760
25	-0.1141	1.4096	25	0.5074	-2.7687
26	0.1773	1.5869	26	-0.1004	-2.8691
27	0.1655	1.7524	27	0.3018	-2.5673
28	-0.2311	1.5214	28	0.0419	-2.5254
29	0.1865	1.7079	29	0.1496	-2.3759
30	-0.0235	1.6843	30	-0.3966	-2.7725
31	0.1265	1.8108	31	0.0897	-2.6828
32	-0.3384	1.4724	32	0.0630	-2.6198
33	-0.0227	1.4497	33	-0.0653	-2.6851
34	-0.3495	1.1001	34	-0.2170	-2.9021
35	-0.1529	0.9472	35	-0.0740	-2.9761
36	-0.3985	0.5487	36	0.4103	-2.5658
37	0.1367	0.6854	37	0.6555	-1.9103
38	0.0775	0.7629	38	-0.5866	-2.4969
39	0.2374	1.0003	39	-0.4708	-2.9677
40	0.1000	1.1003	40	-0.2066	-3.1743

TABLE A.4 - DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: COMPLETION GROUP VERSUS INTENTION GROUP -DEPENDENT ASSUMPTION.

COMPLETION GROUP (N=92)			INTENTION GROUP (N=86)		
DAY	%AR	%CAR	DAY	%AR	%CAR
-40	-0.1815	-0.1815	-40	0.0109	0.0109
-39	-0.0030	-0.1845	-39	0.0856	0.0965
-38	0.0029	-0.1816	-38	-0.3768	-0.2803
-37	0.0050	-0.1766	-37	0.0848	-0.1955
-36	0.0555	-0.1211	-36	0.3242	0.1287
-35	0.3791	0.2580	-35	0.0913	0.2200
-34	0.0306	0.2885	-34	-0.2563	-0.0363
-33	-0.4566	-0.1681	-33	0.1723	0.1360
-32	-0.1651	-0.3332	-32	-0.1519	-0.0159
-31	-0.2008	-0.5340	-31	0.0592	0.0433
-30	0.1336	-0.4003	-30	-0.2137	-0.1704
-29	0.3864	-0.0139	-29	-0.0665	-0.2369
-28	0.3941	0.3802	-28	-0.0322	-0.2691
-27	0.3525	0.7327	-27	-0.2801	-0.5492
-26	0.3382	1.0708	-26	-0.0995	-0.6488
-25	-0.2978	0.7731	-25	-0.2874	-0.9361
-24	0.4311	1.2041	-24	-0.2924	-1.2285
-23	-0.2054	0.9987	-23	0.2119	-1.0167
-22	-0.5160	0.4827	-22	-0.1242	-1.1409
-21	-0.1866	0.2961	-21	0.1704	-0.9704
-20	0.0492	0.3453	-20	-0.5894	-1.5598
-19	0.1895	0.5348	-19	0.1892	-1.3707
-18	-0.2069	0.3279	-18	-0.3779	-1.7486
-17	0.3103	0.6383	-17	0.2471	-1.5015
-16	-0.2588	0.3795	-16	-0.1323	-1.6333
-15	-0.2284	0.1511	-15	-0.1653	-1.7991
-14	-0.1241	0.0270	-14	0.2282	-1.5709
-13	0.1202	0.1472	-13	-0.0492	-1.6201
-12	0.3645	0.5117	-12	-0.2794	-1.8996
-11	-0.4670	0.0448	-11	-0.0663	-1.9659
-10	0.3334	0.3782	-10	-0.2100	-2.1759
-9	0.5220	0.9002	-9	0.4370	-1.7389
-8	0.1037	1.0039	-8	0.0377	-1.7012
-7	-0.0129	0.9910	-7	-0.0711	-1.7723
-6	-0.0567	0.9343	-6	0.1243	-1.6480
-5	-0.3901	0.5442	-5	0.2514	-1.3966
-4	-0.0322	0.5120	-4	0.2137	-1.1829
-3	0.2712	0.7832	-3	0.3040	-0.8788
-2	-0.2887	0.4945	-2	0.3756	-0.5032
-1	1.4499	1.9444	-1	0.2169	-0.2863
0	-0.5725	1.3719	0	0.1925	-0.0938
1	-0.1935	1.1784	1	-0.2671	-0.3609
2	-0.3022	0.8763	2	-0.2192	-0.5802
3	-0.3095	0.5667	3	0.0170	-0.5631

4	-0.0656	0.5011	4	-0.3415	-0.9047
5	-0.4429	0.0582	5	0.1590	-0.7457
6	-0.0853	-0.0271	6	-0.0241	-0.7698
7	0.2175	0.1904	7	0.2455	-0.5242
8	0.4616	0.6520	8	0.0652	-0.4591
9	0.2320	0.8841	9	-0.0896	-0.5486
10	-0.2798	0.6043	10	-0.2476	-0.7963
11	0.0095	0.6138	11	-0.0861	-0.8824
12	-0.3644	0.2494	12	-0.1406	-1.0230
13	-0.0963	0.1531	13	-0.1266	-1.1496
14	0.3310	0.4840	14	-0.1118	-1.2614
15	0.0879	0.5719	15	-0.0253	-1.2868
16	0.2364	0.8084	16	-0.0373	-1.3241
17	0.1453	0.9536	17	-0.1554	-1.4795
18	0.1271	1.0807	18	-0.0884	-1.5679
19	-0.0910	0.9897	19	0.3166	-1.2513
20	0.3034	1.2932	20	-0.1415	-1.3928
21	-0.0454	1.2477	21	0.1233	-1.2694
22	0.4313	1.6791	22	0.3677	-0.9017
23	0.1056	1.7847	23	-0.1171	-1.0188
24	0.1723	1.9570	24	0.0668	-0.9521
25	-0.0433	1.9137	25	0.0701	-0.8820
26	0.2242	2.1379	26	0.0103	-0.8717
27	0.1976	2.3355	27	0.1877	-0.6841
28	-0.2469	2.0886	28	-0.1002	-0.7842
29	0.1735	2.2621	29	0.1847	-0.5995
30	0.0365	2.2987	30	-0.2441	-0.8436
31	0.2019	2.5005	31	0.0306	-0.8130
32	-0.5786	1.9219	32	0.0871	-0.7259
33	0.1008	2.0227	33	-0.1724	-0.8983
34	-0.3924	1.6304	34	-0.2487	-1.1469
35	-0.0362	1.5942	35	-0.2453	-1.3922
36	-0.0490	1.5452	36	-0.4338	-1.8261
37	0.2245	1.7697	37	0.2603	-1.5658
38	-0.1257	1.6440	38	0.0299	-1.5359
39	0.1114	1.7554	39	0.0621	-1.4738
40	-0.0268	1.7286	40	0.0770	-1.3968

TABLE A.5 - DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: DEPENDENT VERSUS INDEPENDENT ASSUMPTION.

DEPENDENT ASSUMPTION (N=178)			INDEPENDENT ASSUMPTION (N=178)		
DAY	%AR	%CAR	DAY	%AR	%CAR
-40	-0.0817	-0.0817	-40	0.0268	0.0268
-39	0.0316	-0.0501	-39	-0.0252	0.0017
-38	-0.1761	-0.2262	-38	-0.0629	-0.0613
-37	0.0023	-0.2239	-37	0.0345	-0.0268
-36	0.1295	-0.0944	-36	0.0499	0.0231
-35	0.1853	0.0909	-35	0.1167	0.1398
-34	-0.1507	-0.0598	-34	-0.0716	0.0682
-33	-0.1425	-0.2023	-33	0.0080	0.0762
-32	-0.1501	-0.3524	-32	-0.0078	0.0685
-31	-0.0551	-0.4075	-31	-0.0212	0.0473
-30	-0.0753	-0.4828	-30	-0.0210	0.0263
-29	0.2087	-0.2741	-29	0.1305	0.1568
-28	0.1351	-0.1390	-28	0.0410	0.1978
-27	0.0449	-0.0940	-27	0.0370	0.2348
-26	0.0833	-0.0107	-26	0.0460	0.2808
-25	-0.2972	-0.3079	-25	-0.1432	0.1376
-24	0.0650	-0.2429	-24	0.0363	0.1739
-23	-0.0016	-0.2444	-23	-0.0303	0.1436
-22	-0.3779	-0.6224	-22	-0.1258	0.0178
-21	-0.0854	-0.7078	-21	-0.0105	0.0073
-20	-0.2125	-0.9204	-20	-0.1062	-0.0989
-19	0.1220	-0.7983	-19	0.0201	-0.0788
-18	-0.2446	-1.0430	-18	-0.0810	-0.1598
-17	0.2771	-0.7659	-17	0.1038	-0.0560
-16	-0.1739	-0.9397	-16	-0.0704	-0.1264
-15	-0.1497	-1.0894	-15	-0.0292	-0.1555
-14	0.0532	-1.0362	-14	0.0655	-0.0900
-13	-0.0149	-1.0511	-13	-0.0580	-0.1480
-12	0.0481	-1.0030	-12	0.0405	-0.1075
-11	-0.2639	-1.2669	-11	-0.1119	-0.2194
-10	0.0384	-1.2286	-10	-0.0426	-0.2620
-9	0.4975	-0.7310	-9	0.1721	-0.0899
-8	0.0835	-0.6476	-8	0.1232	0.0333
-7	-0.0328	-0.6803	-7	-0.0601	-0.0267
-6	0.0451	-0.6352	-6	0.0609	0.0342
-5	-0.0881	-0.7234	-5	-0.0861	-0.0519
-4	0.0765	-0.6469	-4	-0.0054	-0.0573
-3	0.3191	-0.3278	-3	0.2134	0.1561
-2	0.0146	-0.3132	-2	-0.0346	0.1215
-1	0.8080	0.4948	-1	0.2663	0.3878
0	-0.2391	0.2558	0	-0.0789	0.3089
1	-0.1963	0.0594	1	-0.1616	0.1473
2	-0.2748	-0.2154	2	-0.1234	0.0240
3	-0.1676	-0.3830	3	-0.1292	-0.1052

4	-0.1609	-0.5439	4	-0.1243	-0.2295
5	-0.1619	-0.7057	5	-0.0930	-0.3225
6	-0.0958	-0.8015	6	-0.0721	-0.3946
7	0.2054	-0.5962	7	0.0958	-0.2988
8	0.2645	-0.3317	8	0.0971	-0.2016
9	0.0351	-0.2966	9	0.0101	-0.1916
10	-0.2986	-0.5951	10	-0.1145	-0.3060
11	-0.0196	-0.6147	11	-0.0003	-0.3063
12	-0.2578	-0.8724	12	-0.1445	-0.4509
13	-0.0773	-0.9497	13	0.0344	-0.4165
14	0.1600	-0.7897	14	0.0790	-0.3374
15	0.0445	-0.7452	15	0.0296	-0.3078
16	0.1059	-0.6393	16	-0.0293	-0.3371
17	0.0035	-0.6358	17	-0.0177	-0.3548
18	-0.0363	-0.6721	18	-0.0015	-0.3563
19	0.1049	-0.5672	19	0.0288	-0.3275
20	0.0928	-0.4744	20	0.0420	-0.2855
21	-0.0103	-0.4847	21	0.0522	-0.2332
22	0.4201	-0.0646	22	0.1292	-0.1041
23	-0.0331	-0.0977	23	-0.0619	-0.1660
24	0.1197	0.0220	24	0.0938	-0.0722
25	0.0339	0.0559	25	0.0182	-0.0540
26	0.1340	0.1899	26	0.1464	0.0924
27	0.1757	0.3656	27	0.0640	0.1564
28	-0.2300	0.1355	28	-0.1322	0.0242
29	0.1563	0.2919	29	0.0304	0.0546
30	-0.1051	0.1867	*30*	*-0.0331*	*0.0215*
31	0.1230	0.3098	31	0.0288	0.0503
32	-0.2305	0.0792	32	-0.1190	-0.0687
33	-0.0045	0.0747	33	-0.0425	-0.1113
34	-0.2909	-0.2162	34	-0.1317	-0.2429
35	-0.1528	-0.3690	35	-0.0982	-0.3411
36	-0.2248	-0.5938	36	-0.1332	-0.4744
37	0.2358	-0.3579	37	0.0834	-0.3910
38	-0.0629	-0.4208	38	0.0066	-0.3844
39	0.0805	-0.3403	39	0.0605	-0.3239
40	0.0331	-0.3072	40	0.0242	-0.2997

TABLE A.6 - T-TESTS OVER DIFFERENT RANGES OF DAYS: DEPENDENT VERSUS INDEPENDENT ASSUMPTION.

DEPENDENT ASSUMPTION (N=178)			INDEPENDENT ASSUMPTION (N=178)		
Range		T-Test	Range		T-Test
from	to		from	to	
-40	40	-0.2102	-40	40	-0.4443
-30	30	0.4684	-30	30	-0.0441
-20	20	0.2244	-20	20	-0.6101
-10	10	0.9026	-10	10	-0.2522
-5	5	-0.1309	-5	5	-1.4350
-4	4	0.3683	-4	4	-0.7899
-3	3	0.6141	-3	3	-0.2413
-2	2	0.3095	-2	2	-0.7881
-2	-1	3.5813	-2	-1	2.1861
-1	-1	4.9748	-1	-1	3.5532
-1	0	2.4769	-1	0	1.7682
-1	1	1.3245	-1	1	0.1992
0	0	-1.4720	0	0	-1.0526
-2	0	2.0743	-2	0	1.1772
-2	1	1.1920	-2	1	-0.0583
-3	0	2.7788	-3	0	2.4430
-3	1	1.9449	-3	1	1.2211
-3	2	1.0847	-3	2	0.4428
-4	0	2.6960	-4	0	2.1527
-4	1	1.9677	-4	1	1.0851
-4	2	1.1822	-4	2	0.3826
-4	3	0.7409	-4	3	-0.2513
-5	0	2.2396	-5	0	1.4962
-5	1	1.6166	-5	1	0.5705
-5	2	0.9139	-5	2	-0.0482
-5	3	0.5176	-5	3	-0.6198
-5	4	0.1778	-5	4	-1.1126

TABLE A.7 - DAILY (AR) AND CUMULATIVE (CAR) ABNORMAL RETURNS: CAPM VERSUS MARKET MODEL VERSUS MARKET ADJUSTED BETAS (BETA =1).

CAPM-DIMSON BETAS (N=178)			BETAS=1 (N=178)			MARKET MODEL-DIMSON BETAS (N=178)		
DAY	%AR	%CAR	DAY	%AR	%CAR	DAY	%AR	%CAR
-40	-0.0895	-0.0895	-40	-0.0876	-0.0876	-40	-0.0882	-0.0882
-39	0.0387	-0.0507	-39	0.0344	-0.0531	-39	0.0401	-0.0481
-38	-0.1819	-0.2327	-38	-0.1224	-0.1755	-38	-0.1806	-0.2287
-37	0.0419	-0.1908	-37	-0.0077	-0.1832	-37	0.0432	-0.1855
-36	0.1931	0.0024	-36	0.0999	-0.0833	-36	0.1944	0.0090
-35	0.2306	0.2329	-35	0.1836	0.1003	-35	0.2319	0.2409
-34	-0.1095	0.1234	-34	-0.1296	-0.0293	-34	-0.1082	0.1326
-33	-0.1541	-0.0307	-33	-0.1352	-0.1645	-33	-0.1528	-0.0202
-32	-0.1598	-0.1906	-32	-0.1595	-0.3240	-32	-0.1585	-0.1787
-31	-0.0764	-0.2670	-31	-0.0566	-0.3806	-31	-0.0751	-0.2538
-30	-0.0289	-0.2959	-30	-0.0347	-0.4153	-30	-0.0276	-0.2814
-29	0.1601	-0.1358	-29	0.2558	-0.1595	-29	0.1614	-0.1200
-28	0.1874	0.0516	-28	0.1556	-0.0039	-28	0.1887	0.0687
-27	0.0456	0.0972	-27	0.0131	0.0093	-27	0.0469	0.1157
-26	0.1254	0.2226	-26	0.1311	0.1404	-26	0.1267	0.2423
-25	-0.2938	-0.0713	-25	-0.2846	-0.1442	-25	-0.2925	-0.0502
-24	0.0804	0.0091	-24	0.1049	-0.0393	-24	0.0817	0.0315
-23	-0.0016	0.0076	-23	0.0194	-0.0199	-23	-0.0003	0.0313
-22	-0.3319	-0.3243	-22	-0.3436	-0.3635	-22	-0.3306	-0.2993
-21	-0.0157	-0.3400	-21	-0.0353	-0.3988	-21	-0.0144	-0.3137
-20	-0.2615	-0.6016	-20	-0.1844	-0.5832	-20	-0.2602	-0.5740
-19	0.1883	-0.4133	-19	0.1521	-0.4311	-19	0.1896	-0.3844
-18	-0.2912	-0.7045	-18	-0.2315	-0.6626	-18	-0.2899	-0.6743
-17	0.2775	-0.4270	-17	0.2560	-0.4066	-17	0.2789	-0.3954
-16	-0.1988	-0.6258	-16	-0.1955	-0.6021	-16	-0.1975	-0.5930
-15	-0.1989	-0.8247	-15	-0.1710	-0.7731	-15	-0.1976	-0.7906
-14	0.0446	-0.7801	-14	0.1090	-0.6640	-14	0.0459	-0.7447
-13	0.0365	-0.7436	-13	-0.0064	-0.6704	-13	0.0378	-0.7068
-12	0.0519	-0.6916	-12	0.0322	-0.6382	-12	0.0532	-0.6536
-11	-0.2744	-0.9660	-11	-0.2460	-0.8842	-11	-0.2731	-0.9267
-10	0.0695	-0.8965	-10	0.0497	-0.8346	-10	0.0708	-0.8558
-9	0.4797	-0.4168	-9	0.4440	-0.3906	-9	0.4810	-0.3749
-8	0.0709	-0.3459	-8	0.1169	-0.2737	-8	0.0722	-0.3027
-7	-0.0399	-0.3857	-7	-0.0076	-0.2813	-7	-0.0386	-0.3413
-6	0.0273	-0.3584	-6	0.0746	-0.2067	-6	0.0286	-0.3127
-5	-0.0816	-0.4400	-5	-0.1170	-0.3238	-5	-0.0803	-0.3930
-4	0.0855	-0.3545	-4	0.0912	-0.2325	-4	0.0868	-0.3062
-3	0.2855	-0.0690	-3	0.3105	0.0780	-3	0.2868	-0.0194
-2	0.0312	-0.0378	-2	-0.0058	0.0722	-2	0.0325	0.0132
-1	0.8526	0.8148	-1	0.7730	0.8452	-1	0.8539	0.8671
0	-0.2039	0.6109	0	-0.2642	0.5810	0	-0.2026	0.6645
1	-0.2298	0.3811	1	-0.1704	0.4106	1	-0.2285	0.4360
2	-0.2630	0.1181	2	-0.2792	0.1315	2	-0.2617	0.1743
3	-0.1531	-0.0350	3	-0.1197	0.0117	3	-0.1517	0.0226

4	-0.1999	-0.2349	4	-0.1602	-0.1484	4	-0.1985	-0.1759
5	-0.1534	-0.3884	5	-0.1001	-0.2485	5	-0.1520	-0.3279
6	-0.0572	-0.4455	6	-0.0949	-0.3434	6	-0.0559	-0.3838
7	0.2298	-0.2157	7	0.1847	-0.1587	7	0.2311	-0.1526
8	0.2691	0.0534	8	0.2262	0.0675	8	0.2705	0.1178
9	0.0756	0.1290	9	0.0422	0.1097	9	0.0768	0.1947
10	-0.2655	-0.1365	10	-0.2799	-0.1702	10	-0.2644	-0.0698
11	-0.0374	-0.1739	11	-0.0518	-0.2220	11	-0.0361	-0.1059
12	-0.2572	-0.4311	12	-0.2316	-0.4535	12	-0.2560	-0.3619
13	-0.1125	-0.5436	13	-0.0667	-0.5203	13	-0.1113	-0.4732
14	0.1202	-0.4234	14	0.1833	-0.3370	14	0.1215	-0.3517
15	0.0282	-0.3952	15	0.0589	-0.2781	15	0.0295	-0.3222
16	0.1028	-0.2925	16	0.1202	-0.1579	16	0.1040	-0.2182
17	-0.0013	-0.2938	17	-0.0270	-0.1849	17	-0.0001	-0.2183
18	0.0222	-0.2716	18	0.0124	-0.1725	18	0.0234	-0.1949
19	0.1155	-0.1561	19	0.0537	-0.1189	19	0.1168	-0.0781
20	0.0883	-0.0678	20	0.0945	-0.0244	20	0.0893	0.0112
21	0.0245	-0.0433	21	-0.0479	-0.0723	21	0.0256	0.0368
22	0.4231	0.3799	22	0.4281	0.3558	22	0.4242	0.4610
23	-0.0257	0.3542	23	-0.0304	0.3254	23	-0.0246	0.4364
24	0.1213	0.4754	24	0.1180	0.4435	24	0.1223	0.5587
25	0.0101	0.4855	25	0.0295	0.4730	25	0.0112	0.5699
26	0.1204	0.6059	26	0.1453	0.6183	26	0.1214	0.6913
27	0.1918	0.7976	27	0.2306	0.8489	27	0.1928	0.8840
28	-0.1767	0.6209	28	-0.2626	0.5862	28	-0.1757	0.7083
29	0.1785	0.7994	29	0.1247	0.7110	29	0.1795	0.8878
30	-0.0994	0.6999	30	-0.1449	0.5661	30	-0.0984	0.7893
31	0.1180	0.8180	31	0.1521	0.7181	31	0.1190	0.9084
32	-0.2588	0.5591	32	-0.2345	0.4837	32	-0.2578	0.6505
33	-0.0329	0.5262	33	-0.0415	0.4422	33	-0.0319	0.6186
34	-0.3233	0.2030	34	-0.2730	0.1692	34	-0.3223	0.2963
35	-0.1378	0.0652	35	-0.1542	0.0150	35	-0.1368	0.1595
36	-0.2360	-0.1708	36	-0.2985	-0.2835	36	-0.2351	-0.0756
37	0.2423	0.0715	37	0.2177	-0.0658	37	0.2432	0.1676
38	-0.0523	0.0192	38	-0.0604	-0.1262	38	-0.0514	0.1162
39	0.0869	0.1061	39	0.0380	-0.0883	39	0.0878	0.2040
40	0.0374	0.1436	40	0.0292	-0.0591	40	0.0384	0.2424