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THE WEALTH EFFECTS, MOOD AND OUTCOME OF UK TAKEOVER BIDS : AN EMPIRICAL ANALYSIS USING A SIMULTANEOUS EQUATIONS APPROACH.

By

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DECLARATION

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ABSTRACT

The primary objective of this thesis is to investigate whether or not UK takeover bids create wealth gains for the shareholders of the companies involved and what determines the size of these gains. However, as previous empirical research has shown one of the factors influencing the creation of wealth is the mood of a bid, in other words if the bid is hostile or friendly. Due to the fact that previous empirical evidence also suggests the existence of an interdependence among wealth, mood and outcome of bids we develop a simultaneous equations model whereby we explore the determinants of these three factors. Thus, the other two goals of this thesis are to find what determines the mood and outcome of takeover bids.

A large sample of 354 completed and failed takeover bids during the 1963-1989 period was initially used to generate the wealth gains measured in the form of abnormal returns and estimated by event study methodology. Then we used multiple regression analysis to test a range of hypotheses selected from the industrial economics and finance literature with respect to the main objectives of this thesis.

The results obtained show first that target shareholders capture large gains, while bidder shareholders experience small losses around the period of bids announcement. This leads to a small increase of the value of the combined firm. Second, we detect that short run factors reflecting characteristics of the bid process, such as the mood, explain better the wealth created in takeovers than long term strategic factors. However, we find some evidence of managerial and financial synergies. Third, we find that the wealth and mood variables are mutually dependent on each other thereby justifying our simultaneous equations approach. Fourth, we discover that the agency problem exists on both target and bidder but its impact is mitigated by disciplinary bids. This finding gives some support for the argument that hostile bids reflect the disciplinary device that the market uses to correct managerial failure. Fifth, our results suggest that the mood, the level of managerial ownership in the target company and the size of bid premium are crucial in determining the outcome of bids.

CHAPTER 1

THE OBJECTIVES OF THIS THESIS

1.1 Introduction

On 12th of January 1989 it was announced that Procordia A.B., the Swedish conglomerate firm, made an offer to acquire the shares of the British sugar confectionery group Bassett Foods. The sugar confectionery industry in the UK, to which Bassett Foods belonged, was characterised by low profit margins and a lack of financial resources to invest in new brands. On the other hand, the chocolate confectionery industry, in which Procordia had a large share, was expanding as a result of large corporate restructuring in anticipation of the European Integration of 1992. Thus, Procordia was looking for an international partner and a strategic alliance through which it could develop and supply more efficiently its products in the European market. Under this scenario, Procordia would be ready to provide Bassett Foods the marketing expertise and funds required and Bassett Foods would give easier and cheaper access to the UK and Netherlands markets.

Procordia was making a cash offer of 400p per share with a loan note alternative valuing Bassett Foods at £63m. As a result of the bid Bassett Foods share price increased from 300p which was its pre-bid level to 456p within two days. However, the management of Bassett Foods rejected the offer as inadequate and argued that the company would prefer to remain independent. Bassett Foods management attempted to cancel the takeover first by referring the bid to the Office of Fair Trading (OFT) on the grounds that it would be unfair if Procordia acquires a UK company, since UK companies cannot do the same in Sweden without the permission of the

Swedish government. However, this argument failed to gather support from the OFT and finally the bid was not referred to the Monopolies and Mergers Commission (MMC).

However, in the meantime Cadbury Schweppes made an equity offer (02/02/89) valuing each of the shares of Bassett Foods at 579p with a cash alternative of 536p which was recommended by the management of Bassett Foods. As a result of the merger, the combined firm would obtain a 15% share of the UK sugar confectionery market. The management of Bassett Foods would retain their positions and would be responsible for the control of the combined group in the post-merger period. Due to the friendly response of Bassett Foods management Cadbury immediately acquired 14.9% of Bassett's equity capital and although Procordia had a pre-merger equity interest of 10.1% in Bassett, Cadbury managed to acquire the 72.1% of Bassett's share capital and complete the takeover on the 4th of March 1989.

The above case, which is included in the sample of companies analysed in later chapters illustrates some of the issues examined in this study. First, a bid was made by a bidding company to acquire a target firm in order to pursue its strategy. As we saw, the bid then generated significant wealth gains for the shareholders of the target company.

However, the bid was against the will of the target management so we have what is called a hostile bid. The management of the target company took certain actions to resist the bid. Thus, Bassett Foods facing a hostile bid from Procordia attempted to gain a reference to the MMC using what is called legal or political lobbying and then, when this failed, used a "white knight" strategy in which an alternative company (Cadbury) offered a higher premium and pledged that managers of Bassett Foods would retain the control over the enlarged group's assets in the post-merger period.

As a result of this, the management of Bassett Foods recommended the offer from Cadbury so that the first bid from Procordia failed while the Cadbury one was successfully completed. Furthermore, the rival bid by Cadbury resulted in a higher offer generating higher wealth gains for target shareholders. Therefore, the response of managers was decisive for the bid's outcome and the wealth created. The attitude of managers defines what is called the mood of the bid, in other words whether a bid is considered hostile or friendly. From the above it can be seen that three important issues arise in any takeover bid, concerning the wealth created, the mood surrounding the bid and the outcome of the bid. These are the issues addressed in this thesis. This introductory chapter serves the purpose of highlighting the main objectives of our research in relation to the wealth, the mood and the outcome of UK takeover bids.

In the next section of this chapter we briefly discuss the background and development of Mergers and Acquisitions (M&A)[1] activity in the UK. In the light of that, in section 1.3 we present the primary objectives of our research, explain why the distinction between hostile and friendly[2] takeover bids is so crucial in this study and emphasise the main areas of our contribution. At the end of the chapter, we present a preview of the chapters that follow and the

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[1] A **merger** represents a change in ownersip and control of a company when two or more independent companies agree to combine their assets forming a new company which exercises ownersip and control over the joined assets. An **acquisition or takeover** takes place when a company (called acquiring or acquiror) obtains ownership or control over the assets of another company (called acquired or acquiree) by purchasing more than 50% of equity capital. As the term merger has no particular legal meaning in UK, the terms merger, acquisition or takeover are used interchangeably.

[2] A **hostile** or **contested** takeover bid is a bid (offer) that is made against the volition of the management of the target company, while a **friendly** bid is a merger that has been agreed between the two companies involved. In chapter 4 we shall give a more detailed definition of the terms hostile and friendly bid.

main conclusions reached.

1.2 Mergers and Acquisitions in the UK : the Background.

The UK has experienced an upsurge of takeover activity in the last decade. Large deals have been made and long battles have been bitterly fought. The process of corporate restructuring in British industry which started in the 60s and 70s has continued on a vast scale, though not without costs. Companies have paid millions or even billions of pounds to make hostile bids draining their cash reserves or increasing their leverage excessively. Undoubtedly, the 80's was the decade of hostile bids in UK and US.

A variety of factors help to explain the rise of hostile bids in the UK. First, **a new economic and legislative enviroment** created under Mrs Thatcher's administration, which enhanced the role of markets in the economy and induced a wave of privatisations causing a boom in overall merger activity. Second, **innovations in takeover financing** such as combinations of cash and various securities (debt, shares, warrants and options) and the increased use of debt and especially of junk bonds (highly risky bonds which provide high yield) made it easier for bidders[3] to raise the capital necessary to finance takeovers, particularly hostile ones. Third, **the existence of corporate raiders** who acquired undervalued companies aiming to break them up selling different divisions to different companies at inflated prices, or by making employment cuts with the objective of making large profits in a short term period. However, this phenomenon was more frequently observed in US.

In response to the above factors which enabled bidders to

[3] When a company makes a bid to buy shares of another company it is called a bidder, or bidding firm and the company who receives the bid is called target firm or biddee.

initiate hostile bids target companies developed a variety of defensive tactics in order to repel hostile bidders. These included the announcement of financial information (e.g. forecasts of profits and dividends, revaluation of assets), following a "white knight" strategy[4], initiate corporate restructuring (e.g. divestments), or attempting to obtain a reference to the MMC[5]. These strategies along with many others are reported by **Sudarsanam (1991)**. Thus, as we have already entered the decade of 90s, it seems that the large costs incurred by bidding and target firms and the increased exposure to financial risk as a result of takeovers combined with the recessionary climate have made companies more cautious about engaging in acquisitions and especially hostile ones.

Therefore, in the last four years we have seen a decline in the number of bids made and mergers completed. **Chan (1990)** reported that in 1985 in the UK contested bids ammounted to 36% of the total number of bids but in 1989 this percentage fell to 22%. Furthermore, a survey carried out in 1993 by Coopers & Lybrand revealed that almost half of the acquisitions occuring between 1973 and 1988 failed to achieve the predicted financial performance.

The above phenomena have caused increased controversy and

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[4] As explained earlier, this strategy aims to attract a friendly bidder (white knight) who will offer a higher premium or better terms of compensation or retirement to the managers of target company, so that they will recommend the bid and the takeover will be completed.

[5] The MMC is a regulatory body established in 1948 with the initial purpose of investigating monopolies. After 1965 the role of MMC was reinforced by obtaining the authorisation to examine the consequences of a proposed takeover on competition. If a bid is referred to the MMC by the General Director of the Office of Fair Trading (OFT) the takeover is blocked for a maximum period of 6 months during which the MMC takes it decision. Thus, the management of target company has considerable time at its discretion to organise better its defense strategy and find a white knight.

concern among economists about the socioeconomic impact of takeovers. Traditionally, mergers have been examined in the light of two important aspects, namely competition and economic efficiency. Mergers have frequently attracted criticism due to the alleged negative effect they have on competition. The increase of market power of the merged firms can lead to monopolies and the subsequent socially undesirable costs associated with them. Empirical evidence offered by **Utton (1971)**, **Prais (1976)** and **Hannah & Kay (1977)** suggest that mergers have a negative impact on competition because they increase aggregate and market concentration[6]. However, to answer the question whether or not mergers are socially desirable one has to estimate the possible gains from an increase in the economic efficiency of the merging firms.

In our thesis we are mainly concerned with the issue of economic efficiency, in other words whether takeovers lead to an increase in wealth for the companies involved or to a waste of corporate resources. However, we only examine the economic impact of takeovers on the shareholders of the companies involved and not on the other groups of participants such as debtholders, labour force and the society in general.

1.3 Issues to be addressed.

This thesis addresses itself to three main issues. The **first** is whether or not takeovers create wealth. We examine the wealth gains accruing to bidding, targets and the combined firms. We also distinguish between successful and unsuccessful takeover bids.

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[6] **Aggregate concentration** is measured by the share of net assets of the 100 largets companies and shows the importance of these firms in the economy as a whole, while **market concentration** is measured by the percentage of output of the 5 largest firms in a product market.

The **second** issue is to identify the determinants of wealth creation in completed mergers for acquirers, acquirees and the combined firms. To answer this question we will examine successful bids only. We test the influence of several variables on the wealth gains giving particular emphasis to the mood surrounding the bid, i.e. if it is hostile or friendly. The reasons for doing so are twofold. The first is to test the economic impact of hostile bids on wealth created given the existing controversy about hostile bids. The second reason is to investigate whether the wealth gains and the mood of bids are simultaneously determined and in order to do that we shall examine the wealth and mood developing a simultaneous equations system.

Finally, the **third** issue investigated is to consider the factors determining the outcome of bids. We shall also use a simultaneous equations framework to test the existence of an interrelationship among the outcome, wealth and mood. Below we discuss these issues in greater detail.

1. Do takeover bids create wealth ?

The primary goal here is to investigate whether takeover bids enhance the economic efficiency of the bidding and target companies and to consider the division of gains between them. If takeovers create value for the shareholders of the companies involved then the market allocates resources effectively and takeover activity is economically desirable, but if the total wealth effects of takeovers are negative then this suggests a loss of wealth by the participants and a waste of corporate resources.

A second goal is to establish whether there is any difference in the size of wealth gains between completed and failed bids. If completed bids give higher wealth gains than failed ones for both bidders and targets this suggests that

expected synergies[7] may be a possible source of these gains. If the opposite is true, i.e. failed bids create higher wealth gains, this suggests that the bid released new information about the target company which caused an upwards revaluation of its shares (information asymmetries hypothesis[8]).

In this study, wealth creation is measured in terms of shareholder abnormal returns estimated by "event study" methodology[9]. Four different models are used to estimate the abnormal returns of bidding, target and combined firms over various time intervals[10]. A large sample of 354 bids covering the period of 1963-1989 was collected for the purposes of this research using a number of different sources such as Investor's Chronicle, Mergers and Acquisitions Monthly, London Share Price Database (LSPD), Datastream and Extel cards. The sample of 354 bids contains

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[7] As a result of the merger, synergies can be realised from the combined use of assets and control. Thus, we have operational synergies (e.g. economies of scale), financial synergies (e.g. increased debt capacity and tax advantages) and managerial synergies resulting from the replacement of the incumbent management team by a more efficient one.

[8] The information asymmetries hypothesis states that information is not symmetrically distributed among market participants allowing some investors to have information that others do not have.

[9] "Event study" analysis attempts to estimate the impact of an event (e.g. takeover) on the share prices of the companies involved by calculating what is called abnormal return. Abnormal returns measure the difference between the actual shareholder's returns and the returns that would have been in the absence of the takeover using a prediction model. The methodology will be explained thoroughly in chapter 4.

[10] The four models are the market model, the market model adjusted for thin trading, the market adjusted return and the mean adjusted return model. The time intervals include the pre-announcement, announcement, post-announcement and post-outcome period of a bid. All the above concepts are defined in chapter 4 and the pertinent empirical analysis is carried out in chapter 5.

247 completed and 107 abandoned takeovers making it possible to distinguish between the wealth gains of completed and failed bids.

We also estimate the wealth effects of the combined firm by calculating the total returns using as weights the market values of bidding and target companies. However, this reduces the initial sample of 354 bids to 253, due to the unavailability of the market value data for the majority of companies before 1979. Thus, we perform the tests and report the results of our analysis first for the sample of 1963-1989 and second for the sample of 1979-1989.

2. What are the determinants of wealth creation in completed takeovers ?

Our objective here is to find what determines the wealth gains in completed takeover bids for the bidding, target and combined firms. Previous empirical evidence has shown the presence of interdependence between the wealth created and one of the factors influencing it, namely the mood of a bid. Thus, **Walkling (1985)** found that a hostile bid increases the wealth gains for target shareholders and **Baron (1983)** argued that the probability that the bid will be hostile is higher when managers believe that the wealth offered to target shareholders is too low or when they have a strong preference for control. This suggests that wealth and mood may be mutually dependent variables. For example, if the wealth offered to target shareholders is too low then the bid may be hostile and a hostile bid will increase the final premium paid. In order to test for this interdependence we need to examine the determinants of wealth and mood within the framework of a simultaneous equations system.

Therefore, another objective of this work is to investigate the determinants of the mood of a bid. Given the controversial nature of hostile bids we shall test to see

whether they result in higher wealth gains due to bidder's overpayment or because of the anticipation of managerial synergies. If the latter proposition is shown to be true this will support the argument of **Morck, Shleifer & Vishny (1988a)** that hostile takeovers is the disciplinary mechanism of the market for corporate control which leads to the replacement of inefficient management and enhances the economic efficiency of the firms acquired.

Examining the wealth and mood equations simultaneously makes it possible to investigate a number of direct and indirect effects. This is particularly important for example, in the case where an explanatory variable has a direct effect on the wealth equation and an indirect effect through the mood equation. Under a single equations approach the latter relationship would have passed undetected.

The system of simultaneous equations to be estimated has the following form :

$$WEALTH = f\{MOOD, \underline{X}\} \qquad (1.1)$$

$$MOOD = f\{WEALTH, \underline{Y}\} \qquad (1.2)$$

where WEALTH and MOOD are the jointly (simultaneously) determined variables and $\underline{X}$ and $\underline{Y}$ are vectors representing the predetermined explanatory variables[11].

Since our concern here is with completed mergers the sample of 253 bids over the period 1979-1989 is reduced to 178[12]. We extract the bidder, target and total returns for these bids from the set of those which had already been calculated for the original sample of 354 bids.

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[11] We incorporate a number of variables which have been identified in the literature to explain the wealth gains and the mood of bids.

[12] The total number of 253 bids was further reduced to 238 because of unavailability of data for some of the other explanatory variables. This gives 178 completed and 60 failed bids.

3. What determines the outcome of a bid ?

Our initial sample included failed takeovers in addition to completed ones. So, the question that arises is what influences the probability that a bid will succeed or fail?

Previous work adopting a single equations framework has suggested a certain relationship among the outcome, wealth and mood. Thus, **Hoffmeister & Dyl (1981)** documented that hostile bids are associated with a lower probability of success and **Walkling (1985)** empirically showed that a large bid premium increases the probability of a successful outcome. Given, the interrelationship between wealth and mood described above it seems reasonable to suggest that the three variables outcome, wealth and mood may also be simultaneously determined.

The association between the three variables wealth, mood and outcome can be described as follows. Wealth gains offered to target shareholders may affect the mood which at the same time affects the final wealth created and both of them influence the outcome. However, the outcome does not affect the mood or the wealth. Based on the previous empirical evidence mentioned above we expect that hostile bids will negatively affect the probability of their success and higher bid premia will be positively associated with successful bids.

The argument outlined above makes it necessary to examine the outcome of a bid in conjunction with the creation of wealth and its mood suggesting the use of a simultaneous equation system. This system will incorporate the following three equations :

$$\text{OUTCOME} = f(\text{WEALTH}, \text{MOOD}, \underline{Z}) \qquad (1.3)$$

$$\text{WEALTH} = f(\text{MOOD}, \underline{X}) \qquad (1.4)$$

$$\text{MOOD} = f(\text{WEALTH}, \underline{Y}) \qquad (1.5)$$

where WEALTH, MOOD and OUTCOME are the jointly determined variables and $\underline{X}$, $\underline{Y}$ and $\underline{Z}$ are three vectors representing the exogenous explanatory variables used in the three equations. The WEALTH and MOOD variables are defined as before while the OUTCOME is a dummy variable through which bids are classified as successful or unsuccessful. Thus, we have two binary variables (OUTCOME and MOOD) and one continuous variable (WEALTH).

In the analysis of the three equations system the sample is composed of 238 bids (178 completed and 60 failed) for the period 1979-1989. Again we extract the bidder and target returns (reflecting the wealth variables) for these bids from the set of those which had already been calculated for the original sample of 354 bids.

As we shall see in chapters 6 and 7 various empirical studies have investigated the three main questions addressed above. However, a number of features differentiates our work from these studies. These features are discussed in the next section.

1.4 Main contribution of our work.

The present work entails four main novel features. First, it is the first UK study examining the determinants of wealth gains and outcome of bids in the context of a simultaneous equations system. This creates also the need to consider and test the existence of a possible endogeneity problem between mood and wealth for the first system of equations and outcome, wealth and mood for the second one. An endogeneity problem arises in a simultaneous equations system when the jointly determined (endogenous) variables are correlated with the error terms of the equations. For example, if the mood and wealth are endogenous variables and we do not adjust the appropriate estimator then we shall obtain results which are biased. We shall test for exogeneity of

wealth and mood in the first system and outcome, wealth and mood variables in the second system by performing a Hausman exogeneity test.

If the variables prove to be statistically endogenous then we estimate the above equations applying the two-stage mixed estimator proposed by **Maddala (1983)** which is suitable when one or two endogenous variables (mood and outcome) are measured in binary form and the other (wealth) is measured in continuous form. However, if the variables prove to be exogenous then we apply the standard Ordinary Least Squares (OLS) model for the wealth equation and the logit model for the mood and outcome equation.

Second, it is the first UK study examining the determinants of the mood (hostile or friendly) of a bid using a multiple logit regression analysis framework. It should also be mentioned, that it is one of the few UK event studies which distinguishes between hostile and friendly bids using a rigorous and clear-cut definition of hostility.

Third, it is the first UK study, as far as we aware of, that examines the determinants of the outcome of bids using a multiple logit regression analysis. As **Walkling (1985)** argued, a non-linear model such as the logit is the appropriate one to use in order to explain the dependent variable mood which is measured in binary terms.

A fourth novelty of our study is the inclusion of certain explanatory variables in the equations of wealth, mood and outcome. To the best of our knowledge no published UK event study has tested the impact of the level of overall economic activity (measured by a business cycles variable), the directors' interests in a non-linear form, the effect of major shareholdings, the difference in the gearing and valuation ratios between bidders and targets and the free cash flow of the bidder on the wealth gains of bidding,

target and combined firms. The same also applies for testing the effect of some of these variables (e.g. difference in valuation, gearing ratios, directors and other major interests) on the mood and outcome of bids.

1.5 Summary and preview of the thesis

We began this introductory chapter by discussing why the concern about the role of takeovers and especially hostile ones has increased over time and why there is a strong interest among economists to undertake research in this area. Then, we highlighted the main objectives and contributions of this empirical study. Thus, we aim to test whether or not mergers create value for the shareholders of the companies involved, what are the likely sources of the value created and what determines the mood and outcome of bids.

The next chapter deals in detail with the causes of mergers and acquisitions. Thus, it critically discusses various theories which have attempted to explain merger activity. It also serves to place our own research in context.

The third chapter reviews the empirical evidence collected so far regarding the impact of mergers on economic efficiency. The main studies in UK and US which use the accounting, event study and case study methodologies are discussed.

The fourth chapter presents the first of our own empirical results. First it explains the structure of our sample and database and provides some useful definitions; second, it describes the "event study" analysis and third discusses certain econometric issues such as the tests of statistical significance, the size effect and the thin trading problem.

Although, our empirical work begins in chapter 4 with a

description of the database and the methodology used to estimate the wealth gains created in takeovers, the more important empirical work is presented in chapters five, six and seven. Thus, the fifth chapter investigates the first of the three issues to be addressed in this thesis, i.e. whether or not mergers create value. The first part describes our hypotheses. The second part highlights some empirical issues such as the sample, the observation period and the models used. The size effect and the thin trading problem are also discussed in this section. The third, fourth and fifth part contain the results for bidding, target and combined firms respectively. The sixth section compares our results with those of other studies and the seventh section states and discusses our conclusions.

Thus, we find that in general bidding firms experience small negative abnormal returns while target companies realise large positive gains around the bids announcement date and until the outcome date. This results in a small overall positive gain for the combined firm. However, when we examine the long-term share price performance of bidding companies (about 2 years after the bid) we find that they tend to suffer large losses. These findings, which are similar to other empirical studies [e.g. **Limmack (1991a)**] suggest either that mergers are bad investments in the long run or alternatively they signify the inability of the existing models (e.g. market model) to estimate correctly the long run abnormal returns of the securities examined.

We also find that completed takeovers appear to generate higher wealth gains for bidder and target shareholders than failed ones. However, this difference proved to be statistically insignificant. This suggests that the possible source of gains may be the release of new information, which led to a permanent revaluation of target firm's shares, instead of expected synergies. Only in the short-run did the bids, which failed in the first place but were subsequently

completed in the 2 year post-merger period examined, give significantly lower total returns than completed bids. This finding gives limited support for the argument that the market might have expected the realisation of possible unique synergies arising from a specific combination of the bidder's and target's assets and the failure of the bid signalled the loss of these synergies. Alternatively the market might have considered the bid failure as a weakness of the initial bidder.

The sixth chapter develops the analysis of the second issue to be addressed, i.e. the sources of wealth gains for bidding, target and combined firms. The second and third sections review the relevant literature in the determinants of wealth and mood and set out our hypotheses. The fourth part describes our sample and defines the variables we use while the fifth part discusses some estimation issues. The sixth part contains the regression results obtained about the determinants of target's wealth gains and mood. The next two sections present the results concerning the determinants of wealth gains for bidding and the combined firms. Finally, the last section presents our conclusions.

These conclusions can be summarised as follows. First, the source of takeover gains seems to arise both from short-run and long-run factors. Amongst the short-run factors we include the mood of the bid, the existence of competing bidding firms and the mode of payment while the long-run factors include the expected synergies created from the combined use of assets. However, our results suggest that these expected synergies seem to arise from the anticipation of increased managerial efficiencies and debt capacity which will take place in the post-merger period rather than from economies of scale resulting from operational synergies.

Second, hostile bids create higher wealth gains for both target and bidding companies which indicates that the market

views hostile takeovers as the mechanism which exerts discipline on inefficient managers and provides the opportunity for previously undervalued target companies to show their full potential in the post-merger period. Thus, we do not find any evidence for a transfer of wealth from bidders to targets in hostile bids. Third, from the negative relationship between the mood of bids and the degree of managerial ownership we found the existence of the agency problem. Target companies with a low level of managerial shareholdings are more likely to reveal value decreasing behaviour and encourage disciplinary bids. Thus, we detected the existence of the agency problem and the way that it is mitigated.

The seventh chapter attempts to give an answer to the third issue of what determines the outcome of a bid and follows a similar framework to that used in chapter 6. Our main results suggest that the probability of a successful change in ownership and control of the target firm increases when the bid is friendly, the bid premium (wealth gains) offered is high, the level of managerial ownership is high and the bidder has already obtained an equity interest in the target company in the period prior to the bid.

Finally, chapter eight presents in detail our final conclusions with respect to the issues examined in chapters 5, 6 and 7 and summarised above. Chapter 8 also attempts to highlight some practical implications for shareholders and managers of the companies involved including some suggestions for government policy.

Based on our findings that bidder shareholders suffer on average small losses from takeovers we support a less benign approach in merger policy than that of the government. On the other hand, the fact that hostile takeovers create gains for both bidders and targets in anticipation of future managerial synergies supports the argument that they

function as a disciplinary device for inefficient managers where the internal control mechanisms fail to perform effectively.

However, disciplinary takeovers may not be the best way of monitoring management. We suggest that the impovement of the corporate governance system and the enhancement of the role of large shareholders, especially of institutional investors, will contribute significantly to alleviate the agency conflict in the modern corporation and consequently reduce the need for disciplinary and hostile bids.

CHAPTER 2

A REVIEW OF MERGER THEORIES

2.1 Introduction

Several theories have been developed over time to explain the causes of mergers and acquisitions activity. In this chapter we shall highlight and discuss these theories in order to understand the results of the empirical studies reviewed in the next chapter.

In section two we discuss the **neoclassical or profit-maximisation theories** which claim that mergers are likely to generate profits primarily because of synergies, diversification and increased market power. A special emphasis is given to the **tax benefits theory** (as a part of financial synergies) which argues that managers undertake mergers to exploit tax savings such as the carry-over of net operating losses and tax credits.

In the third section we describe the main arguments of **managerial theories** emphasising the agency problem and the free cash flow theory. The fourth section highlights the **market for corporate control hypothesis** and explains how the existence of such a market enhances takeover activity and at the same time mitigates the agency problem.

The fifth section discusses the **information asymmetries hypothesis** while the sixth section presents the **economic disturbance theory** and the **overreaction hypothesis.** Although, the economic disturbance theory is based on the information assymetries hypothesis we considered it better to examine it separately. Finally, in the last three sections we present the **hubris hypothesis**, the theory of

mergers as an **alternative to corporate bankcruptcy** and the **market myopia hypothesis.**

2.2 Neoclassical or profit-maximisation theories.

These theories were mainly founded by **Friedman (1953), Alchian (1950)** and **Becker (1962).** These economists argued that companies are likely to pursue profit-maximization goals, due to the existence of an **"economic natural selection process"** in every perfectly competitive market which forces companies to make profits if they want to survive and minimise the likelihood of a value-decreasing takeover.

The above approach assumes a priori that the main objective of managers is to maximise shareholder wealth and does not consider that there may be a conflict of the interests between shareholders and managers as a result of the separation between ownership and control in the modern corporation. Thus, managers consider takeovers as any other investment decision [**Halpern (1983)**] and hence invest only if they envisage that the expected net present value (NPV) of the takeover investment will be positive and will generate profits for the shareholders. Therefore, according to these theories it is expected that takeovers generate profits both for acquiring and acquired companies and the level of competition will only dictate the size of the profits and their division between them. These profits are likely to be made due to **increased efficiency gains, increased market power** and **tax considerations.**

Efficiency gains arise as a result of achieved synergies, diversification and strategic realignment. There are three kind of synergies, namely operational, managerial and financial. First, operational synergies are likely to arise either from the expanded production of one specific product (economies of scale) or from the joint production of two or

more products (economies of scope), which reduces fixed cost per unit for the relevant activities. Although, these synergies can materialise mainly in horizontal mergers they can also take place in vertical and conglomerate mergers. Thus, in vertical mergers economies can be accomplished by reducing the costs of communication, transportation and monitoring costs among different levels of the industry. Finally, in conglomerate mergers such economies can be attained by adding more staff to the planning and control operations.

Second, managerial synergies are generated when a company, operating below its full potential due to inefficient management, is acquired by a company with more competent managers. The acquiring company will then provide superior management with excess capacity and the management of the acquired firm can supply the necessary organisation capital (accumulated learning from firm specific assets). This is more likely to be the case in horizontal and vertical mergers.

Although, it could be argued that managerial synergies are also important in conglomerate acquisitions at the level of generic managerial abilities (administration, planning and control) empirical evidence suggests that replacement of inefficient managers is not the underlying motive for the majority of conglomerate mergers. For example, **Markham (1973)** found that in 18 out of 30 conglomerate mergers scrutinised former managers were not replaced. An explanation for this could be the difficulty for an acquiring firm of effectively managing acquired companies coming from different industries within a short period of time.

Third, financial synergies arise for different reasons such as a match between cash flows and investment opportunities, increased debt capacity and the co-insurance effect of debt

and tax benefits[1]. **Myers & Majluf (1984)** argued that when firms who have excess cash merge with firms that provide new investment opportunities efficiency gains are created. This occurs especially in the case when these firms belong to an industry with fast growth. Empirical evidence given by **Markham (1973)** supports the existence of such synergies.

Another type of financial synergy is provided by the increased debt capacity hypothesis. This hypothesis predicts that when there is a latent debt capacity in the target or the bidding company this will increase the level of the total debt that the combined firm can undertake in the post-merger period.

The increased debt capacity of the combined firm is especially important in the case of pure conglomerate mergers. The idea is that when two firms with imperfectly correlated cash flows merge, the variance of their earnings streams is reduced and subsequently the probability of default for the combined firm becomes lower. This is known as the **co-insurance effect** whereby one firm's assets and cash flows insures the other's and vice versa. **Lewellen (1971)** empirically showed the existence of such an effect in conglomerate mergers.

However, **Higgins & Schall (1975)** argued, using option pricing theory, that less financial risk will increase the value of debt at the expense of shareholder's wealth due to the closer monitoring role of creditors on any risky projects undertaken. The value of the equity is likely to fall because shareholders who bear no responsibility in the case of corporate bankruptcy would prefer a higher level of risk for a higher level of expected return. Thus,

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[1] Although, tax benefits constitute a form of financial synergies leading to higher profits we do not consider them as efficiency gains and consequently we do not include them in our discussion here but we examine them separately at the end of this section.

shareholders act like holders of stock options who prefer a higher level of volatility (more risky projects) than closely monitored investment policy.

This negative effect of the increased debt capacity can be counterbalanced by the fact that increased gearing after the merger event results in higher tax shields on interest payments [**Galai and Masoulis (1976)**]. Furthermore, it has been shown that bondholders do not gain at the expense of shareholders [**Travlos (1987)**].

As we mentioned at the beginning of section 2.1 efficiency gains can also arise from **diversification**. Diversification provides the opportunity for managers and employees to minimise the risk associated with the particular firm and industry to which they belong. Thus, mergers provide a faster and less expensive way of diversifying than internal growth [**Goldberg (1986)**]. Managers and employees cannot diversify by choosing different jobs in different companies in the same way that shareholders chose a portfolio of shares because they have developed skills which are firm specific. Therefore, diversification allows employees and managers to increase their salaries and promotion opportunities and at the same time to reduce labour costs.

Furthermore, diversification allows the tranfer of employees, management teams and information specific to them from business units with declining profits to those with growing profits. Thus, if one unit of the company belongs to a declining industry the diversified firm can avoid the possibility of liquidation by making profits in another unit which belongs to a more profitable industry.

Diversification via mergers can also be a part of a **strategic realignment programme** which aims to adjust rapidly the company to a changing external enviroment and exploit growth opportunities. In contrast to the pure diversifica-

tion described above this kind of strategic realignment enables companies to realise profits by achieving economies of scale and utilising managerial abilities.

A strong motive for mergers can be also provided if an **increase in market power** of the combined firm leads to monopolistic gains. An increase in market power by merger is made possible through the larger size of the combined firm or the higher market share. Monopolistic gains can be achieved then by raising barriers to entry or by affecting the elacticity of demand of the combined firm's products [**Mueller (1980)**]. Barriers to entry can be established if the enlarged firm achieves a lower cost of production and thus can set such low prices for its products that will deter a potential competitor to enter this market. This is very common in the case of horizontal mergers. The elasticity of demand can also be affected if the firm obtains a monopolistic or oligopolistic position in the market and thus can raise the prices without altering the existing demand.

If the above are true then profits arising in mergers motivated by increased market power are likely to be generated by socially undesirable monopolistic gains and not by increased efficiencies. The evidence regarding this argument is mixed. **Eckbo (1983)** and **Stilman (1983)** found that gains are likely to arise from increased efficiencies (e.g. economies of scale) while **Cowling, Stoneman, Cubbin, et.al. (1980)** reported that in the majority of cases they examined market power was increased and monopolistic gains were realised.

Another source of merger gains, but not efficiency gains[2], is **tax savings.** Tax savings constitute one of the motives

[2] We do not consider them as efficiency gains because they form a transfer of wealth from the state (e.g. Inland Revenue Office) to companies.

for takeovers and may also be characterised as a part of financial synergies. There are three main tax benefits. The first is the carry-over of net operating losses and tax credits from one firm to the other with a high level of taxable profits when the new merger entity is created. Thus, the losses or tax credits of one firm can offset the taxes imposed on the profits of the other firm. This advantage is feasible only if the trade of the acquired company is continued[3].

The second tax benefit is called the stepped-up-asset benefit. In taxable acquisition transactions (when the mode of payment is cash) the acquiring company can increase the tax basis of the acquired company assets to the purchase price and this will increase the depreciation which in turn will cause less taxable income and higher cash flows. However, this practice is feasible only in the US, since UK legislation prohibits it.

The third benefit arises from the substitution of capital gains taxes for ordinary income. For example, a firm with poor investment opportunities but excess cash flows can avoid paying dividends (which would have been taxed as ordinary income) by making an acquisition. If the acquirer uses equity to purchase the target company the transaction is not taxed and capital gains taxes will be paid only when he decides to sell this company and the sale generates capital gains.

Auerbauch & Reishus (1987a, 1987b) and **Hayn (1989)** examining the link between tax motives and mergers emphasised the importance of the possible tax losses of the acquired

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[3] In UK the Finance Acts of 1970, 1971 and 1984 attempted to reduce the likelihood that mergers are consummated with the sole purpose to exploit tax advantages by imposing various restrictions, such as that the transfer of ownership or a change in trading activities must have not occured within 3 years from the year of the losses.

company which are carried over by the acquiring company and thus give the chance to the acquirer to offset taxable income of his own company. The stepped-up asset basis was also found to be significant because of the consequent increase in depreciation which in turn results in less taxable profits [**Hayn (1989)**].

2.3 Managerial theories.

Managerial theories claim that in the real world where markets are imperfect managers may have interests that diverge from those of the owners of the company and the "natural economic selection process" does not work via the profit-maximization goals.

Thus, **Winter (1964)** argued that in oligopolistic markets with barriers to entry and large economies of scale it is likely that companies pursue growth-maximization in order to exploit these advantages rather than profit-maximization. **Marris (1964)** went further arguing that companies who do not seek to maximize growth in size or sales and want to maximize profits may be compelled to leave the market. As **Galbraith (1967)** pointed out, firms who are growth maximisers will survive not only because they exploit cost advantages but also because their large size will deter potential bidders from acquiring them. Moreover, as **Marris (1964)** suggested managers may seek to increase their salaries, promotion opportunities, power and status through the growth in size. These objectives might be easier attained via mergers than by increasing the shareholder's wealth.

Jensen & Meckling (1976) expanded the above theory of Marris about managers self interests developing the so-called agency theory. This theory, which was further refined by **Fama (1980)** and **Fama & Jensen (1983),** argues that in the modern corporation there is a nexus of contractual

relationships between principals (shareholders) and agents (managers and employees of all levels). The principals of the company hire the agents to act according to their interests, in other words to maximize the shareholder wealth by making optimal allocation of the corporate resources. The theory postulates that each of these two groups is a rational utility maximizer and thus has its own self interests and goals which maybe in conflict with each other. Under conditions of uncertainty the principals cannot always effectively control the performance of the agents without the agency costs of structuring and monitoring formal contracts. This creates the so-called agency problem.

An agency problem, according to **Jensen & Meckling (1976)** is more likely to occur when the managers do not own a stake of shares large enough to motivate them to maximize the company's profits. Therefore, they tend to find other ways of obtaining higher rewards which are not necessarilly in congruence with shareholders interests. However, it is not guaranteed, that by offering pecuniary and non-pecuniary rewards, managers will be adequately motivated to act in favour of the best interests of principals. One way and possibly the easiest for managers to accomplish their own interests is by acquiring other firms.

Therefore, as **Mueller (1969)** argued, mergers exacerbate the agency problem. In fact, takeovers give the incentive to managers to expand the size of their firms and thus to exert more power, obtain higher salaries, bonuses and other perquisites. According to the same theories, similar conflicting interests may exist between management of the target firm and the shareholders. This happens because the best way for managers to retain their jobs and privileges, etc may be to reject a takeover bid even if the proposed merger is in the best interests of shareholders. One striking example of this problem is reflected in the case of Management Buy Outs (MBO's) when managers purchase the

majority of the share capital in order to secure the control over the firm's assets and to gain independence in their decision making policy.

Managers may also seek to reduce the risk and uncertainty instead of maximising profits. **Cyert & March (1963)** argued that management often attempts to avoid uncertainty by making agreements, negotiations, contracts and generally arranging its environment. Thus, to the extent that managers reduce risk at the expense of profits they act against the interests of shareholders.

An extension of agency theory is the free cash flows hypothesis. **Jensen (1986a,b)** described how the presence of free cash flows encourages managers to engage in takeover activity. Jensen argued that when companies become profitable they often enjoy the existence of free cash flows. Free cash flow was defined by **Jensen, 1986a: 323)** as:

> "the cash flow in excess of that required to fund all projects that have positive net present values when discounted at the relevant cost of capital".

Jensen also argued that companies with high free cash flows are more likely to have a low growth rate and poor investment opportunities. If managers do not distribute the excess cash flows in the form of cash dividends to their shareholders and make value decreasing acquisitions the agency problem will be aggravated. According to **Jensen (1986a, b)**, another way of mitigating the existence of this problem is to issue debt, so that future excess cash flows will be evaporated by interest payments to bondholders.

2.4 Market for corporate control hypothesis.

This hypothesis forms an expansion of the early theories of the prementioned "economic natural selection process" as it

has been documented in the works of **Friedman (1953)**, **Baumol (1965)** and **Manne (1965)**. Manne first mentioned the notion of a "corporate control mechanism" which exists in every perfectly competitive market. **Jensen & Ruback (1983)** defined the market for corporate control as a market "with the right to control the management of corporate resources". The above hypothesis asserts that whenever managers take decisions which harm the interests of shareholders causing a decline in the value of their holdings the market itself intervenes with the takeover mechanism in order either to remove the incompetent management and replace it or to give them an opportunity to improve the performance of the company if they can successfully resist the bid.

Holl (1977) argued that in the first case the market exercises punitive discipline (completed takeover) whereas in the second one it applies corrective discipline (cancelled takeover). Both arguments have been confirmed by a plethora of empirical studies which we will discuss in chapters 6 and 7. For example, **Holl & Pickering (1988)** and **Morck, Shleifer & Vishny (1988a)** showed that underperforming companies were likely to be targets and consequently taken over.

2.5 Information asymmetries hypothesis.

The main supposition of this theory is that not all information is available to all investors and hence the initial bidder may possess information about the real value of the firm which other investors do not have. Thus, the bidder may believe on the basis of privileged information that the target is undervalued and that a change in the management team will show its real potential.

The real value of the firm is expressed by the valuation

ratio or the Tobin's Q ratio[4]. **Marris (1964)** suggested that if a bidding firm values the target company at a higher price than the market, this is a sign that the bidder believes that the target is undervalued. In this case the bidder may also expect that he can make a substantial profit purchasing the company at a price slightly higher than the actual price but far less than the true value. A low Tobin's Q ratio is particularly important in periods with high inflation, because the costs of assets replacement tend to rise higher than the market value of assets and thus acquisitions become a cheaper solution than the purchase of these assets in the market.

Therefore, targets that have been considered undervalued on the basis of asymmetric distribution of information to the market participants or inside information are more susceptible to takeover bids than other firms. This shows that there is scope for speculatory gains if trading of the target's shares is made on the basis of inside information[5].

Empirical evidence offered by **Dodd & Ruback (1977)** confirms the existence of information asymmetries by showing that share prices of target companies during a tender offer announcement and after have the tendency to increase irrespectively of the outcome of the takeover bid. This was described by **Bradley, Desai & Kim (1983)** as the "sitting on

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[4] The valuation ratio is the stock market value of a company's equity capital divided by the book value of its net assets. A variation of this ratio is the Tobin's Q ratio which is equal to the market value of assets divided by the cost of assets replacement. A low Tobin's Q ratio may mean among other things that a company is undervalued. The valuation ratio literature is covered in more details in chapter 6.

[5] Although, there are strict laws regarding insider trading (Companies Securities Act 1985) it is not feasible to exclude the possibility that various groups of investors may act in a speculative way due to information assymetries.

a gold mine" hypothesis because it indicates that the bid revealed positive information about a previously undervalued target which caused the upwards revaluation of its share prices.

Although the above might indicate a possible market inefficiency since the market seems to incorrectly value companies before the bid, there are two other possible explanations for this upwards movement of share prices in the post-bid period. The first one is that the bid triggers target management initiatives to rescue the firm by increasing its efficiency. This has been referred to as the "kick in the pants hypothesis" [**Bradley, et.al. (1983)**].

The second explanation denies that new information is responsible for this upward valuation, because it claims that expectations about future synergies and replacement of inefficient management (if the offer proves to be successful) is the only real reason for that. **Bradley, Desai and Kim (1988)** corroborated the above argument showing that if the takeover fails and target companies do not receive another bid in the 5 year post-bid period then any excess returns realised in the bid period will disappear and the share prices of these companies will fall back to their previous levels. Thus, the stock market rewards target firms with higher returns because it anticipates the realisation of future synergies rather than responding to the release of new information about the target firm.

2.6 Disturbance theory and Overreaction hypothesis.

This theory established by **Gort (1969)** constitutes a special case of information asymmetries. The theory argues that when there is a difference in the expectations between shareholders of a firm and non-shareholders (outsiders) regarding the present value of the firm the probability of a takeover bid is enhanced.

Thus, if outsiders on the basis of information possessed about the prospects of the economy and the specific firm make a more optimistic evaluation of the shares of this company than its shareholders they will be motivated to bid and in order to succeed they will be prepared to pay a premium above the market value of the company. On the other hand, if shareholders evaluate their shares more pessimistically than non-shareholders (who did not adjust their expectations to new information) they will be encouraged to sell their shares and obtain the bid premium.

Gort claimed that the above phenomenon is likely to occur in a period of economic disturbance which induces a large upwards or downwards drift in the share price as a result of which mergers become more frequent in such periods. However, empirical evidence by **Nelson (1959, 1966)** and **Melicher, et.al. (1983)** has corroborated only the first part of Gort's theory regarding the upwards movement of share prices. These studies showed that mergers increase in "bull markets" which is what disturbance theory predicts but decrease in "bear markets" which is contrary to the second part of Gort's analysis.

The fact that stock market prices tend to rise excessively in bull markets and decline also excessively in bear markets was also spotted by **Shiller (1984, 1989)** and **Geroski (1984)** who attributed this irrational behaviour of investors to psychological factors (fads and fashion movements). This phenomenon caused **DeBondt & Thaler (1985)** to formulate the overrreaction hypothesis which predicts that markets tend to overreact at the release of good or bad information at a microeconomic or macroeconomic level.
Due to this correlation between stock market activity and takeovers it can be expected that market's overreaction can be one of the causes of increased acquisition activity (merger waves). This has been empirically documented in the study of **DeBondt & Thompson (1992).**

2.7 Hubris hypothesis.

The hubris hypothesis was developed by **Roll (1986)** to explain the negative abnormal returns of bidding companies which have been observed in many empirical studies. However, it can also be used to explain merger activity. The theory claims that managers of bidding firms tend to overpay in acquisitions because of a misjudgment of the true value of their targets. Furthermore, managers of bidding companies with a good past performance are more likely to make these valuation errors because they tend to develop an arrogant attitude regarding their knowledge and experience. Hubris theory provides an alternative to managerial theories in explaining negative abnormal returns of bidders.

Although many empirical studies [e.g. **Varaiya (1985)**, **Limmack (1990)**] have documented the fact that bidders tend to overpay especially in the case of multiple contested bids it cannot be inferred that this is caused due to hubris or agency reasons. In other words, it is difficult to identify if the tendency of bidders to overpay occurs because of valuation errors of managers or due to their attempt to pursue their own interests. Furthermore, it seems that contrary to what the hubris theory predicts, it was found that bidding firms who realised low returns from acquisitions are exactly those companies which showed a poor performance in the pre-bid period [**Morck, Shleifer & Vishny (1988b)**].

2.8 Mergers as an alternative to corporate bankruptcy.

The theory was first established by **Dewey (1961)** who contemplated mergers as "a civilized alternative to bankruptcy or voluntary liquidation that transfer assets from falling to rising firms". This theory attempts to explain why financially distressed companies would prefer rather to be acquired than go into liquidation or receivership. **Lee & Barker (1977)** argued that companies will

chose the merger option because the bankruptcy costs are avoided and the debt capacity of the combined group may increase in the post-merger period while at the same time shareholders receive cash or equity of the acquiring firm.

However, managers may benefit more from the bankruptcy alternative since their interests do not always converge with shareholders. **Pastena & Rutland (1986)** showed that in companies with deteriorating financial performance the shareholders favour the merger alternative because it gives them higher returns than the liquidation option. Furthermore, when concentration of ownership among a few shareholders is high and managerial shareholdings are low there is a higher probability that decisions will be taken in favour of the merger solution.

The theory of the merger alternative to liquidation for ailing companies was further elaborated and supported by **Peel & Wilson (1989)**. They tested some financial variables (e.g. profitability, size, leverage, liquidity, annual share price movements etc) and non-financial variables (e.g. ownership concentration) of firms facing financial difficulties) and they found that on average financially distressed companies which were subsequently acquired had faced less financial problems than those who went to liquidation. However, they also found that, contrary to Pastena, et.al. (1986) study, size and ownership concentration did not influence the merger/liquidation alternative. These results suggest that mergers present to some extent a viable solution to liquidation.

2.9 Market myopia.

It has been argued that stock markets suffer from short-termism because they undervalue companies which tend to exhibit low profits due to the high cost they impose for Research & Development (R & D) plans. Thus, these companies

become potential takeover targets for corporate raiders who are interested in making large and quick profits. As a result of this managers of these target companies may decide to cut long term investment plans in order to avoid being taken over [**Shleifer & Summers (1988)**]. If the above occurs then the R & D expenditure will decrease and this may seriously undermine the long term prospects of these companies and possibly be harmful for the economy as a whole.

Although, there is some truth to the argument that managers of companies facing the threat of a takeover may cut down the R & D plans [**Stein (1988)**] the majority of empirical evidence does not support the market myopia hypothesis as a whole. For example, **Hall (1987)**, **McConnel & Muscarella (1985)** found that companies with a high level of R & D costs had not been undervalued by the market. Furthermore, **Pound, Lenn & Jarrell (1986)** showed that only a tiny fraction of target companies had incurred a high level of R & D expenditure in the pre-bid period.

2.10 Summary and Conclusions

This chapter has been designed to provide the necessary theoretical background in order to understand the implications of the results of the empirical studies described in the next chapter. For example, if the majority of these studies shows that mergers increase shareholder wealth then the motive for takeover activity is likely to be the maximisation of profits rather than managers self interests. It will also be easier to understand our empirical analysis which follows in chapters five, six and seven.

Therefore, we presented the main theories which have been developed to date in order to explain merger activity. The contribution of each of these theories was critically

discussed and some empirical evidence was offered to highlight their real value. We distinguished eight main groups of theories which we discussed in separate sections. To summarise them, these are the profit-maximisation theories, the managerial theories, the market for corporate control hypothesis, the information asymmetries hypothesis, the disturbance and overreaction hypothesis, the hubris hypothesis, the alternative to corporate bankruptcy theory and the market myopia argument.

As we saw in this chapter, there is no theory than can satisfactorily explain alone the takeover phenomenon suggesting that, first each theory has some validity because each case of merger is not identical with the other and second that a combination of the theories reviewed above might be more appropriate in order to explain mergers and acquisitions activity.

CHAPTER 3

THE ECONOMIC EFFICIENCY OF TAKEOVERS : AN OVERVIEW OF THE EMPIRICAL RESEARCH.

3.1 Introduction

The purpose of this chapter is to present and discuss the empirical work which has examined the creation of wealth gains from mergers and acquisitions activity. Thus, the current chapter is directly associated with chapter 5 which examines the issue of wealth creation using event study analysis.

The second section of this chapter presents the findings of empirical studies which have used accounting data and discusses the pros and cons of this approach. The third section highlights the results of the main studies using event study analysis. We distinguish between US and UK event studies because there is a divergence in the results obtained for these countries.

The fourth section demonstrates the findings of other studies using a different methodology than those described above and illuminates their advantages and disadvantages. Finally, the last section comprises a summary of our review of the empirical literature.

3.2 Empirical research using accounting data.

As mentioned in section 1.4.2 of chapter 1 this approach examines the pre-merger and post-merger performance of the acquiring and acquired companies using data extracted from the accounts of these companies. Studies which follow this approach are also called **ex-post studies** [**Caves (1989)**]

because they examine the companies performance after the merger.

Looking at the early years that this approach has been applied we can mention the studies of **Rose & Newbould (1967)**, **Kelly (1967)**, **Reid (1968)**, **Lev & Mandelker (1972)**, **Singh (1971, 1975)**, **Buckley (1975)**, **Tzoannos & Samuels (1972)**, **Utton (1971, 1974)**, **Kuehn (1975)**, **Firth (1976)**, **Meeks (1977)**, **Levine & Aaronovitch (1981)** and **Choi & Philippatos (1983, 1984)**. The above studies examined a series of financial variables for acquired and acquiring companies (before and after the merger event) using univariate or multivariate discriminant analysis or some combination of the two. Despite the fact that their results were not absolutely unanimous we can summarise them in the following way.

First, the post-merger profitability of the acquiring companies [measured in terms of Return On Capital Employed (ROCE) or On Equity (ROE)] either remained the same [e.g. **Lev & Mandelker (1972)**] or deteriorated [e.g. **Reid (1968)**, **Utton (1974)** and **Meeks (1977)**]. For example, **Meeks (1977)** found that about 60% of the the acquiring companies in their sample experienced significant losses in the sixth year post-merger period.

Second, there was a negative change in valuation ratios (book value of assets/market value of assets) of the acquiring companies as a result of the acquisition. For example, **Firth (1976)** showed that acquiring companies which had in general higher valuation and price/earnings ratios in the pre-merger period than acquired companies experienced a decline in those ratios whereas acquired companies experienced the opposite effect. The above trend was more dominant in the case of unrelated mergers as **Choi & Philippatos (1983, 1984)** documented.

Third, there was little difference regarding profitability and liquidity between acquiring and acquired firms in the pre-merger period. Therefore, **Levine & Aaronovitch (1981)** reviewing the relevant previous empirical literature argued that acquiring firms are not motivated by profit-maximisation objectives when they engage in takeover activity. They further argued that they rather consider long term benefits such as diversification of risk and more security which they can pursue via growth in size.

In the decade of 1980's the interest for research in the area of takeovers was renewed including new topics such as examining the impact of the outcome of a bid or its mood on the wealth gains created. Thus, **Holl & Pickering (1988)** distinguished between completed, failed and contested[1] mergers. They employed discriminant analysis in order to appraise the performance (measured in terms of ROCE and ROE) of acquired and acquiring companies in completed, abandoned and contested mergers. They found that in general acquiring companies were larger, more profitable and had faster growth than acquired companies in the pre-merger period but they detected that the post-merger performance of successful bidders declined in comparison with unsuccessful bidders. Also, the performance of the target companies who resisted the bid and survived in the 3 year post-bid period improved because it seems that the bid functioned as an alarming mechanism to the management of these companies to enhance the economic efficiency of their companies. However, these target companies had a higher growth in size than the corresponding growth in profits during that period.

It seems that Holl & Pickering's results give some support to the mamagerial interests hypothesis rather than to the maximisation of shareholder wealth hypothesis as the growth in size seems to be the main motive for management of both

[1] They defined a contested merger as the one that two or more bidders bid for the same target company.

bidders and targets.

Taffler & Holl (1991) using a similar discriminant analysis approach reached similar conclusions to those of Holl & Pickering (1988). More specifically, they claimed that the main determining factor of a successful takeover is the "relative strength of the target company". Also, targets are not financially inferior in terms of profits than bidders and hence bidding firms do not aim to improve their profitability with the acquisition. They acquire them because they want to increase their size in order to attain scale economies and synergistic gains.

Also, **Parkinson & Dobbins (1989)** focused on the successfully resisted hostile bids attempting to investigate the financial performance of targets and bidders engaged in such activity for the years 1975-1984. Using discriminant analysis they unveilled that targets had less profits, more liquidity and they take less investment for future growth than bidders in the two years before the bid.

Probably their most important finding -which coincides with Holl's & Pickering's study (1988)- was that in the post period of bid failure (two years after) the targets considerably improved their shareholders wealth related variables (dividend payment, earnings per share) whereas the bidders experiencend a decline in their profit related variables (ROCE, ROE and EPS). This finding supports again the argument that the bid acted as a spur to increase managerial efficiency.

In contrast with the previous studies, **Healy, Palepu & Ruback (1992)** found a positive impact of mergers on the performance of the merged firms. They canvassed 50 US mergers consummated during the period 1979-1984 using post-merger accounting data and found an increase in the operating cash flows of the companies examined relative to

their industries average benchmark.

They also detected that the increase in cash flows was more salient in the case of horizontal mergers suggesting the existence of operating synergies. Furthermore, they revealed that the improved performance of merged firms does not induce a decline in long term investments such as R & D expenditure.

Thus, looking at the above studies it can be seen that the vast majority of them, with the exception of Healy, et.al. (1992), demonstrated a negative impact of mergers on the economic efficiency of the combined firms. Profitability of the companies involved either did not improve or substantially declined in the post-merger period. The motives of managers seemed to be rather growth in size than growth in profits giving some support for the managerial theories of takeovers. An alternative explanation could be found in the hubris of managers. However, there was also some evidence in favour of the disciplinary role of the market for corporate control since target companies who successfuly resisted an unwelcome bid subsequently improved their performance in the post-bid period.

Although, the studies based on the above approach have undoubtedly contributed to our understanding of the creation of wealth gains from takeover activity we should be aware of some of their shortcomings. One of them is that they do not give a direct measure of the fluctuations in shareholder wealth and they do not adjust for market movements (as event studies methodology does). Also, data based on the companies accounts are sensitive to accounting practices (e.g. acquisition or merger accounting) which are at the discretion of managers decisions.

Also a general problem of ex-post studies is that they do not contemplate the performance of the companies under

scrutiny in the hypothetical case that they had not been taken over. Thus, they allow the influence of other exogenous events to contaminate the results. This problem is mitigated with an ex-ante approach adopted by event study analysis.

Furthermore, there are serious problems in defining a comparable control group (a group of companies that are not being taken with a group of those taken over) because the two groups must have similar characteristics (e.g. industry, size, market activities, etc).

On the other hand, the validity of the results of studies solely based on accounting data is not subject to the market efficiency hypothesis and other problems associated with event study analysis which we describe in chapter 4.

3.3 Empirical studies using share-price information.

The second approach uses share-price information to predict the rates of return that shareholders of bidding and target companies would have obtained if the merger had not occured. The difference between the actual and the predicted returns is called the abnormal return and is attributed to a specific event (in our case the takeover bid). Several models are used in order to estimate the actual and predicted returns. This method which adopts an **ex-ante** approach [**Caves (1989)**] is called **event study**. The validity of the results obtained using this technique depends on how accurately the share prices reflect all available information, in other words whether the market is efficient[2] or not. The prevailing belief among financial economists about market efficiency on which this approach is based along with the inherent drawbacks of accounting studies made

[2] A detailed description of the market efficiency hypothesis and the event studies analysis is made in chapter 4.

the event study methodology to be increasingly popular in the last two decades, first in USA and then in UK. However, event study analysis has also received a number of criticisms regarding some problems associated with its use which we discuss in detail in section 6 of the next chapter.

As mentioned in section 3.1, US and UK studies produced divergent results, at least in the earlier years of research, with respect to the profitability of takeovers. In general, US studies were more optimistic than their British counterparts concerning this issue. The section which follows presents the main empirical studies first for the US and then for the UK.

US studies

The first US studies to investigate the share prices performance in a takeover were those of **Halpern (1973)**, **Mandelker (1974)**, **Ellert (1976)**, **Dodd (1976)**, **Dodd & Ruback (1977)**, **Langetieg (1978)** and **Kummer & Hoffmeister (1978)**.

Mandelker's (1974) findings provided strong evidence for the profit-maximization theories discussed in the previous chapter[3]. Using the Capital Asset Pricing Model (CAPM)[4] of **Sharpe (1964)** Mandelker found that shareholders of acquiring firms do not lose in any case. On the contrary, they may attain some positive abnormal returns both before and after the merger event. He also discovered that a perfectly competitive and efficient market exists for the whole period of observation. He finally concluded that the replacement of inefficient management was the motive for the acquisition. **Ellert (1976)** and **Langetieg (1978)** using more or less the

[3] As we can recall from section 2.1 of chapter 2, these theories argue that managers engage in takeover activity motivated by profit maximisation objectives. Wealth gains are to be realised mainly because of the synergies created.

[4] This model along with three other models, namely the market model, the market and the mean adjusted return model are explained in chapter 4.

same methodology reached similar conclusions.

However, these early studies considered the event date (on which returns were measured) to be the day of the final outcome of the bid and not the first announcement date. In doing so, they failed to anticipate the reaction of the stock market before the effective date. Furthermore, they focused only on completed mergers and did not examine the case of contested or unsuccessful mergers.

Dodd & Ruback (1977) were the first to use a different date for the first announcement of the bid and the final outcome. They also distinguished among the three different types[5] that a takeover can take in USA, i.e. tender offer, merger and proxy contest. They examined the impact of tender offers (successful and unsuccessful) for the shareholders of bidding and target firms.

They analysed share price performance 60 months prior to and subsequent to the event month and observed significant abnormal returns for target firms (20.58% for successful tender offers and 18.96% for unsuccessful ones) in the event month. They also found much lower positive abnormal returns for bidders (2.83% for successful tender offers and normal rates of return for unsuccessful ones). Profits according to them, seemed rather to have arisen from an improvement of internal efficiency rather than from synergies or the creation of monopolies. Therefore, their findings were

[5] A **merger** is an offer made by the bidder to the target company's management. Then the management announces the offer to the shareholders in order to vote for accepting it or not. A **tender offer** is an offer directly made to the shareholders of the target company. The offer usually provides cash or shares in exchange for the purchase of the outstanding shares of the target firm. A tender offer can be part of a hostile or a friendly bid depending on whether the management of the target company agrees to the offer or not. A **proxy contest** is an offer supported by an attempt of a group of shareholders to vote against the management in order to obtain control of the board of the directors.

consistent with wealth maximization theories.

Asquith, Bruner & Mullins (1983) found in general small gains for bidding firms and this is again consistent with the profit-maximisation theories. They also found that size determines the relative amount of the gains for the bidding firm. The larger the size, the larger the profits that arise from a successful takeover.

Bradley, Desai, & Kim (1983) analysed the performance of share prices of target firms after an unsuccessful takeover dividing them in two groups : the first contained those firms who received subsequent bids after the first failed bid and the second group contained those firms who did not receive a subsequent bid. They discovered that the first group gained significant abnormal returns whereas the latter one had small negative rates of return. Therefore, they concluded that shareholders of targets obtain benefits only if the two firms are merged due to the synergies realised.

Jensen & Ruback (1983) summarising the findings of 13 US studies (six on mergers and seven on tender offers) claimed that the evidence overall supported the wealth-maximization theories of neoclassical approach. This occurs because both bidders and targets shareholders obtain profits from takeovers resulting in an overall profit for the combined firm. From the 13 studies, only those of **Dodd (1980)**, **Asquith (1983)** and **Malatesta (1983)** found negative returns for bidders.

Jensen & Ruback also observed that target firms' shareholders gained the larger stake of these profits especially when the takeover had been successfully completed. However, when bidders failed to acquire the target companies, they suffered losses which were relatively smaller than those of the corresponding targets. Thus, Jensen & Ruback (1983) argued that the source of the gains

for the combined firm seems to have come from synergies or improved management rather than the creation of market power and monopolies.

The same optimistic view about the wealth gains of mergers and acquisitions is also shared by **Jarrell, Brickley & Netter (1988)** in a more recent review of the takeover literature. They claimed that the gains created from takeovers "reflect economically benefial reshufflings of productive assets".

However, some studies showed that acquiring firms' returns further declined in the 1980's and this implies that bidder's and target's gains maybe sensitive to the period of time under examination. Thus, **Jarrell & Poulsen (1987a)** examining 663 successful tender offers for the period 1962-1985 found that in the 1980's the average premium paid to shareholders of targets was 30% while bidders obtained small abnormal negative returns ranging from -1% to 0 gains in the announcement month. These returns were considerably lower than the positive ones obtained in the decade of 1960's (around 4% and 5%) and those in the 1970's (1% and 2%).

Bradley, Desai & Kim (1988) confirmed the findings of Jarrell & Poulsen (1987), finding that bidder shareholders suffered significant losses in 1981-84 and target shareholders earned significant positive abnormal returns from the synergistic gains created. For this period, Bradley-Desai-Kim attributed this phenomenon to the multiple contested bids initiated after the regulations passed with the Williams Act in 1968.

One of the few US studies which showed substantial losses for acquiring companies was that of **Magenheim & Mueller (1988)**. They found significant negative abnormal returns of -23.94% for acquirers in the 2 year post-acquisition period.

However, they found that much smaller losses (-7.2%) were obtained if a 5 year (instead of a 3 year) pre-bid period was used to estimate the model parameters. Thus, they documented that abnormal gains are sensitive to the length of the pre-bid estimation period.

One study which considered the case of target shareholders in failed bids is that of **Ruback (1988)**. He examined the share-price performance of targets for unsuccessful takeovers for 3 years before and 3 years after the outcome of the offer. He found that targets which remained independent after the failed bid realised significant losses which they have persisted for some time. This resulted in losing the gains materialised in the bid announcement period before the cancellation date.

However, in the case where a target company was taken over following a subsequent bid the negative abnormal returns were much lower. Thus, their results are close to those reported by Bradley, et.al. (1983) giving support to the expected synergies hypothesis as the source of gains for target shareholders.

The results of **Franks, Harris & Titman (1991)** offered a more optimistic view regarding the post-merger performance of acquiring firms and offered another explanation for the negative returns observed in the previous studies. They showed that in the 3 year post-merger period bidding firms obtain close to zero gains (-0.11%) a finding which is in great conflict with the results reported by Magenheim & Mueller (1988). In their work they employed a multi-factor portfolio which was composed of eight separate portfolios. Four of them were constructed representing different firm sizes, the other three were dependent on different dividend yield rates and the last one was based on past returns. This eight-factor portfolio benchmark which was designed to

control for the size effect[6] did not exhibit any significant abnormal performance of bidders in contrast with the single factor portfolios (not adjusted for size effect) which showed negative abnormal returns. Therefore, Franks, et.al. (1991) concluded that negative post-merger returns of bidders, obtained in previous studies, were "due to benchmarks errors rather than to mispricing at the time of announcement".

UK studies

The first UK event studies were those of **Franks, Broyles & Hecht (1977)** and **Firth (1979, 1980)** who found that on average acquirers realised losses which tended to persist for a long time after the bid. More specifically **Franks, et.al. (1977)** discovered that acquirers made small abnormal returns (3.5%) only in the event month and negative returns thereafter. However, targets made abnormal gains of about 26% and caused small overall gains (10%) for the merged firm.

Firth (1980) distinguished between successful and unsuccessful takeovers showing that bidders and targets make more gains in unsuccessful bids. For example, he revealed that at the announcement month bidders experienced negative returns of -6.3% in completed bids and -6% in failed bids, while targets at the same month realised 28% in completed bids and 31% in failed ones. Firth (1980) also estimated that the overall result for the combined firm was a loss of £36.6m documenting that the losses of the acquirers had offset the gains of the acquirees. This finding provides support for the managerial theories of takeovers rather than the wealth maximisation theories.

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[6] The size or small firm effect describes the tendency of small companies to overperform the market portfolio. This is a well documented market anomaly and will be discussed in detail in chapter 4.

Franks, Harris & Mayer (1988) using a large sample over an expanded period of time (1955-1985) discovered that the magnitude of gains and their allocation between acquired and acquiring firms, heavily depends on the mode of payment i.e. cash or equity. They revealed that in the case of cash financing, both targets and bidders made positive gains which were higher (for the period of four months before the announcement day until the month after the announcement) than in the case of all equity financing.

Franks & Harris (1989) made a comparative study using UK and US data (a large sample of 1800 completed takeovers) during the period 1955-1985 offering a more optimistic view than previous UK studies, as regards to abnormal returns generated in takeover bids giving some support for the wealth maximisation theories. They found that shareholders of target companies obtain significant abnormal returns and shareholders of bidding companies either obtain small gains or zero gains in the worst case. Franks & Harris (1989) using the market adjusted return model reported a small positive gain of 1% for bidders at the announcement month and a large gain of 23% for targets at the same month. They also examined the 2 year post-merger performance of acquiring firms and found that the abnormal returns obtained were sensitive to the model used. Thus, the market adjusted return model gave a positive abnormal return of 4.8%, the CAPM generated a 4.5% positive gain, but the market model produced a negative gain of -12.6%.

Limack (1991a), like Firth (1980) also distinguished between completed and abandoned takeovers during the period of 1977-1986. However, he detected that, contrary to Firth, bidding and target companies make higher gains in completed bids than failed ones.

Limmack examined two obervation periods. The first period starts from the bid month and ends with the outcome month.

In this period successful bidders made a negligible loss of -0.2%, while unsuccessful bidders realised a loss of -6.02%[7]. In the same period target firms experienced substantial gains of 37.15% in successful bids and 27.23% in unsuccessful ones. This caused an average return for the combined firms of 5.84%. In the second period which covers a period of two years after the bid, bidding companies suffer large losses which vary from -4.47% in completed bids to -20.23% in failed bids whereas target companies in failed bids retain only a small part of their gains (2.68%).

In a later study, **Limack (1991b)** further examined failed bids distinguishing between target companies which were immediately acquired in the 5 year post bid period and those which remained independent during the same period of time. He found that bidders corresponding to the first group of targets (targets which were subsequently taken over by another bidder) made higher losses (-23%) than bidders corresponding to the second group (targets survived) who made losses of -19.32%.

Nevertheless, targets which survived the 5 year post-bid period obtained higher gains (-4.61%) than those target companies of the second group (subsequently acquired) who made negative gains of (-7.47%). The latter finding is in conflict with Bradley, et.al. (1983) who showed that higher gains arise in the case where targets are subsequently taken over and mergers take place.

The negative returns experienced by bidders in the Limmack's studies were also observed in two other more recent UK studies. **Sudarsanam, Holl & Salami (1993)** using daily data reported negative returns of -5.09% for bidders (estimated

[7] Limmack used three estimation models, namely the market model, the market adjusted return model and a model adjusted for thin trading. Results reported above use the model adjusted for thin trading and are not very different from those given by the other two models.

by the market model adjusted for thin trading) for the period of ten days before the event day until ten days after the bid. This figure was reduced to -3.63% when the market adjusted return model was used. However, targets in the same period gained 22.12% and 18.6% with the Dimson's model and the market adjusted return model respectively.

Also, **Wong, Dobson, Wright & Thompson (1993)** examining only abandoned bids found that bidders in the announcement month make -3% negative gains while targets make only 12% positive returns. However, looking at the 2 year post-bid period they reported large negative gains of -41% for bidders and -39% for targets.

At this point, if we look at the British literature of event studies and compare it with the US one, we can observe two primary features. The first is that the event study methodology has received less attention in the UK (at least in the 1970s and early 1980's) than in the USA. This may be possibly explained by the fact that the development of computerised databases in UK occured later than in US.

The second feature is that most of the UK studies, except that of **Franks & Harris (1989)**, tend to report lower abnormal returns for bidders than the corresponding US ones. From the US studies, only those of **Dodd (1980)**, **Asquith (1983)** and **Malatesta (1983)** found a negative effect of takeovers on acquiring firm shareholders. However, both UK and US studies agree that shareholders of target firms make large positive abnormal gains in takeover bids. Possible reasons for this divergence in results regarding bidding firms may be the differences in regulation and the different degree of small firm effect that exists in the two countries. For example, if bidders are relatively larger from targets in UK than in US then according to the size effect problem we should expect lower abnormal returns for UK bidders.

3.4 Other empirical studies.

Studies included in the third category examine the impact of takeovers either at a **plant level** or by using a **case study** approach. The first method examines each merger case by separating the acquired units from the parent companies and the latter investigates each pair of merged firms separately adopting a questionnaire approach. One advantage of the plant level approach is that they manage to isolate the effects of mergers on the subsidiaries from the parent companies, because they examine each firm separately at the level of establishment. Studies which follow the case study approach use the management opinions and measurements about the outcome of takeovers in which they have been personally involved. This has the advantage of learning from the top management how they evaluate the benefits of takeovers, but it also has the drawback of introducing possible bias from the subjective judgements of managers.

Two studies which can be classified in the studies examining the merged firms at a plant level are those of **Mueller (1985)** and **Ravenscraft & Scherer (1987a, 1987b)**. These studies examined the impact of mergers on economic efficiency isolating the acquired units from the acquiring firm using accounting data from the individual firms rather than the consolidated accounts of the merged firms. **Mueller (1985)** reported a negative relationship between mergers and market share of the acquired companies. He canvassed a sample of 1,000 US companies for the period 1950-1972 which had been involved in horizontal and diversified mergers and he found that acquired firms on average experienced a dramatic fall in their market share (only 18% retained it), while about the 88% of firms who remained independent were able to maintain it.

Also, **Ravenscraft & Scherer (1987a, 1987b)** using the US Federal Trade Commissions Line on Business Data for the period 1975-1977, examined the impact of mergers, sell-offs

and spin-offs[8] on profitability. They discovered first that many acquiring firms sold parts or even the whole of companies that they had acquired because they were unable to run them profitably while these divested firms have been making profits prior to acquisition. They also found that the profitability of the acquired units had been declined on average about 15.9% below their industries profitability since the acquisition event. These results suggest clearly that mergers were a bad investment decision both for the acquiring and acquired firms.

In a more recent study, **Holl & Pickering (1991)** employing data from the WorkPlace Industrial Relations Survey for 1984 (which contains information taken from managers and employees representatives) examined the impact of growth, size, degree of diversification, degree of company's dominant position in the market and changes in ownership on company's financial performance. In respect of takeovers, they found that acquired companies reported weaker financial performance but higher growth in sales as a result of the merger compared with other establishments in the same industry.

Looking at the questionnaire/case study approach we can mention the work of **Kitching (1967)** who was one of the first researchers in US who followed such a technique in order to assess the impact of mergers on economic efficiency. He found that about a third of the 19 merger cases examined were considered to be failures from the managers involved. **Newbould (1970)** using a similar method for a sample of 38 UK mergers found that about 50% of the companies in his sample either failed to achieve any synergistic gains or achieved very little. This is very important if we consider that all mergers in this sample were horizontal.

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[8] Spin-off occurs when a new entity is created by a distribution of the shares of a subsidiary to the existing shareholders according to the pre-event proportion.

In another UK case study carried out by **Cowling, et.al. (1980)** it was documented that none of the cases examined showed higher gains in efficiency (joined profit/turnover) relative to the control group of non-merging competitors while 6 out of 9 merged firms showed an actual decline in efficiency in the six year period after the merger. However, they found evidence of enhanced market power and monopolistic gains which are socially undesirable.

Finally, **Pickering (1983)**, using a questionnaire methodology, examined 20 abandoned mergers between 1965 and 1975 in the UK. He found that the abandonment of the bid urged the management of the target companies to make some changes which resulted in improving corporate performance. Thus, takeover bids functioned as a spur to improve managerial efficiency on those target firms that survived. Furthermore, he argued that the management and the shareholders of the companies involved as well as the government agencies (e.g.MMC) effectively contributed in abandoning the "right" mergers and preserving the public interest.

Among the group of studies following a case study approach we can also classify the survey conducted by **Coopers & Lybrand (1993)**. This study which used interviews with senior executives of the UK top 100 companies which had been engaged in 50 deals with a total value over £13 billion, found that almost 50% of the acquisitions have failed to attain the expected financial objectives. The most likely causes of failure identified were the divergence in management attitudes and inadequate post-acquisition integration planning.

Closing this section we could conclude that the studies examining takeovers at a plant level or using a case study approach support in a very clear way, with the exception of Pickering's (1983) study, the argument that mergers have a

negative impact on the economic efficiency of the firms involved.

3.5 Summary and conclusions.

This chapter presented the findings of the main US and UK empirical studies regarding the economic efficiency of mergers and acquisitions. Empirical research has followed three main approaches in dealing with the above issue. Studies adopting the first approach use accounting data and examine the post-merger performance of the merged firms comparing it either with the pre-merger performance or with that of a control group (e.g. non-acquired companies). As we saw in section 3.2 these studies which are usually undertaken by industrial economists give an overall neutral or pessimistic view of the impact of takeovers on economic efficiency.

Event study methodology offers a more dynamic approach to the analysis of wealth effects of takeovers by predicting shareholder returns in the absence of takeovers and comparing them with the actual returns. Since the market efficiency hypothesis gained credibility, event study analysis has become popular in estimating the wealth gains of takeovers. It was previously pointed out that there is a difference in the results obtained between US and UK studies, with UK studies being more pessimistic, especially if long term performance is examined. However, in general the findings of event studies in both countries give a more positive picture regarding efficiency gains in takeover bids compared to that provided by the accounting studies or the studies at a plant level and case study approach.

The plant level and case study approaches can be more specific and attempt to make an in-depth analysis of the companies merged since each firm is scrutinised separately, subsidiaries are disaggregated from the parent companies and

acquired units are also distinguished from the acquiring companies. However, the case study approach is subject to the element of personal judgement and the results can be biased. From a review of the main US and UK studies made in section 3.4 we found that the empirical evidence based on this approach does not support the efficiency argument of mergers.

CHAPTER 4

DATA & EVENT STUDY METHODOLOGY

4.1 Introduction

This chapter describes our database and explains the event study methodology which we are going to apply in the next chapter in order to estimate the wealth gains created in takeover bids. The current chapter is composed of four main sections. The first section presents the sources and structure of our initial dataset. The second one defines some issues and describes our final sample. The third section provides an outline of event study analysis by discussing the fundamental hypothesis of market efficiency (upon which the analysis is based) and by illustrating the various steps taken to apply the methodology. This section ends by discussing some of the limitations of event study methodology. Finally, the fourth section addresses and explains some econometric issues specific to any event study.

4.2 Obtaining the initial sample of firms.

One of the difficulties of doing research in the field of mergers and acquisitions in the UK, is that there is no computerised database which can supply all the data required, and it is therefore necessary to make use of a range of different data sources. These sources are both primary and secondary.

4.2.1 Primary sources.

As **primary** sources, we used the EXTEL cards, the MIRAC and the Stock Exchange microfiches (compiled by Financial

Times), the weekly publications of Investor's Chronicle, the index of the Times and the Financial Times newspapers, the Financial Times Mergers & Acquisitions International and Mergers & Acaquistions Monthly. More specifically, from the EXTEL cards we obtained data regarding the announcement and outcome dates, any subsequent multiple bids where appropriate, the outcome and the mood of bids, the mode of payment, and information about the ownership interests[1] of directors, institutions and other major shareholdings as well as the bidder's pre-merger equity interest. The Times index was used to derive the exact dates of the bids which occurred in the period 1963-1974 and the index of Financial Times was used to check the dates of some bids during the period 1981-1989.

Through the "bids and deals" pages of the Investor's Chronicle we investigated every bid of our sample for the whole period 1963-1989, in order to ascertain its mood. The Investor's Chronicle was particularly useful when deciding whether or not a bid was hostile because it supplies all the information concerning the reaction of the target's management throughout the bid battle including the defense tactics employed by the target, which constitutes a critical factor in our definitions (section 4.3.1). The use of Investor's Chronicle was also important for collecting information about bids in the period before 1975 and for choosing bids to examine during the whole period (1963-1989) of our sample. Finally, the Financial Times, Mergers & Acquisitions International and Mergers & Acquistions Monthly were used to select some additional cases of takeover bids for the period 1986-1989.

4.2.2 Secondary sources.

As **secondary** sources of data we used the samples of

[1] Information about ownership interest was collected for the 1979-1989 period.

Pickering & Holl (1988), **Parkinson & Dobbins (1989)** and a part of **Limack's (1991a)** sample. Having the names of bidders and targets in these samples and an approximate bid date, we started collecting the necessary set of information via the primary sources. The contribution of these samples will be further explained in section 4.2.3 of this chapter.

Our final secondary source provides the necessary share price data. In the UK two main computerised databases provide such data, namely **DataStream** and **London Share Price Database (LSPD)**. The fact that our sample starts in 1963 poses a restriction for using DataStream and the daily data it supplies, because this database includes only a tiny minority of companies before 1974. Doing a preliminary search we discovered that we could not trace from DataStream share price information for most of the companies in the 1963-1974 sub-sample. Therefore, we decided that it was better to use LSPD to obtain the monthly[2] logarithmic returns for bidding and target companies as well as for one market index (FT-ALL Share Index) and hence to achieve a more consistent database. However, even LSPD provides data only for one third of the companies in the period 1955-1974 and therefore it was not possible to obtain data for some of the companies incorporated in our initial sample.

4.2.3 The structure of the initial sample.

The sample was chosen to cover the period 1963-1989. The sample does not include a full list of all the bids which occured during this time period because of the difficulty of

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[2] We are aware that the use of daily data in event studies analysis minimises the bias and increases the efficiency of the abnormal returns estimated [**Brown & Warner (1985)**, **Morse (1984)**]. However the problem of unavailablity of historical daily data in the UK constitutes a crucial restraint for using them. Furthermore, as Morse (1984) argued the use of monthly data can be recommended in the case of event day uncertainty and our sample before 1975 suffers somewhat from this problem.

detecting the failed bids. There is no database which gives this information for the period before 1985. LSPD gives all the completed bids (however, as mentioned before only one third of the companies in the period 1955-1974 is included) but not the failed bids. Therefore, we decided to work with a combination of the primary and secondary sources described in the previous section. More specifically, the sample is composed of mergers which took place in each of the time periods described below :

a) 1963-1975

As an initial source of information for this period we used the bids included in the work of **Holl & Pickering (1988)** and then we added 31 bids which we traced through the pages of Investor's Chronicle.

The sample of Holl & Pickering (1988) contained 50 cases of actual mergers, 50 cases of abandoned mergers and 33 cases of contested ones for the years 1963-1975. While this paper provided the financial year of the merger, it did not give the exact date of announcement of the first bid. Therefore, we had to detect the dates of first announcement and outcome of these bids in order to meet the needs of our work. Furthermore, we had to identify which of the actual, abandoned and contested[3] mergers were hostile or friendly bids. Also, as a product of search of the primary source, 31 further takeover bids were added for the period 1963-1975. Hence, the total number rose to 164 bids for this period (table 4.1).

b) 1976-1986

To construct the sample for this period two different sub-samples were used. The **first sub-sample** contains only contested and abandoned bids and has been taken from the

[3] A contested bid in Holl & Pickering study is the bid in which two or more bidders compete to acquire the same target company.

study of **Parkinson & Dobbins (1989)**. The authors initially collected 190 bids but this number was reduced to 68 because they applied each of the following restrictions to their sample:

1) the bid had to be actively rejected by the management of target company;

2) the target company must have survived for at least 2 years after the bid;

3) the target company must have had a full quotation on a UK Stock Exchange at least 6 months before the month of the bid;

4) the company was not in the property, commodity or financial sector.

This sub-sample provided the names of bidders and targets, the month of the first bid announcement and the outcome. However, information concerning the exact dates for first and subsequent bids and the date of the outcome were not provided. Therefore, these dates had to be detected and the bids had to be checked to see if there was any difference between our definition of a hostile bid and the Parkinson & Dobbins definition of a contested bid. Since our definition, which will be explained shortly, is similar to Parkinson & Dobbins we accepted most of these bids as being hostile.

The **second sub-sample** is the sample of **Limack (1991a)**. This sample incorporated a vast amount of information concerning all bids (contested and non-contested, completed and abandoned) which occurred during the period 1977-1986. This study adopted a share price analysis approach and therefore included information on a daily basis regarding bid dates, outcome dates and the results (completed or abandoned). From Limack's sample 210 takeover bids[4] had been selected and

[4] The reason of not using the whole sample of Limack (1284 bids) is that the number of bids selected for this period of time would be disproportionally large compared with the number of bids selected for the previous period 1963-1975 and this might introduce a bias in our sample.

further examined to investigate all the information needed for the purposes of our research, such as the mood of the bid, the existence of rival bidders, the mode of payment, the degree of industrial fit, etc.

Although, Limack's sample has not been extensively used in our research, it proved to be useful in the selection of bids during the 1977-1985 period and moreover, in checking the correct dates of announcement and outcome. Thus, the total number of bids selected for this period ammounted to 278 (table 4.1).

c) 1986-1989

Finally, the **third** part of the sample was not supported by any secondary source, and was collected specifically for the needs of the present empirical study. Using the **primary** data sources described in section 4.2.1, all the necessary information was collected for 180 bids in these 4 years of intense takeover activity.

The total number of bids available in our initial sample is given in table 4.1. However, the total number of bids available at the estimation stage is less than that shown in the table. A number of bids was removed for reasons which will be discussed in section 4.3. Companies from all industrial sectors, except those belonging to the **financial, commodities or property** sector, were included in this initial sample. The reason for this is that the companies in these sectors tend to exhibit different risk and return characteristics from the companies in other sectors. For example, what may be considered as a normal level of debt for banks may be considered as excessive for other companies. We also excluded all **foreign** companies and all **parent** companies which did not have a quotation on a UK Stock Exchange. However, companies in the **Unlisted Securities Market** have been included.

Table 4.1 Number of bids in the initial sample	
Sample period	Bids
1963 - 1975	164
1976 - 1985	278
1986 - 1989	180
Total number	622

4.3 From initial sample to final sample.

The final sample of companies used in our empirical work was altered by our definition of the mood of a bid, by the exact timing of events and by a number of other reasons which will be discussed next.

4.3.1 Defining the mood of a bid.

As mentioned in chapter 1, the mood of the bid is an important variable in explaining abnormal returns in takeovers and therefore it is necessary to have a clear-cut definition of what is a **hostile** and what is a **friendly** bid. However, in the UK the distinction between hostile and friendly bids has not, until recently, received as much attention[5] as in the US.

The mood of the bid is determined by the reaction of the management of the target company when it receives the bid offer. Thus, a **hostile** bid is a bid which the board of the target company immediately and firmly rejects and resists by using one or more defensive strategies. Usually, bids of this kind are rejected by the target's management as being unwanted or unwelcome. However, we judge that in order to

[5] As far as we know, only the studies of Parkinson & Dobbins (1989) and Franks & Mayer (1993) explicitly investigate hostile bids.

classify a bid as hostile it is not enough to be based solely on the language used by the management when it rejects the bid. We should also examine if the management undertakes any serious defense action[6] which has a financial cost for the target company. All of these actions have the additional cost of fees charged by the merchant bank acting on behalf of the target management and therefore trully express the opposition of the management to the proposed bid offer. Such hostility may reflect management's belief that benefits will not follow a merger or that the specific offer undervalues their company, or the desire to protect their own positions and self-interests.

We can illustrate our definition of hostile bids by referring to a number of the bids in our sample. These include the cases of Fodens vs. Rolls Royce in 1977, Savoy Hotels vs. THF in 1981, Linfood vs. Argyll in 1981, Pilkington Bros. vs. BTR in 1986, Haden vs. Trafalgar House in 1985 and McCorquodale vs. Norton Opax in 1986. In all of these cases the target firms rejected the bid on the grounds of various arguments[7]. For example, Fodens had announced that a bid "was totally unwelcome from any bidder at this stage of recovery", Savoy had rejected the bid as " wholly unwelcome and totally unacceptable", Linfood Industries named the bid as "unsolicited and opportunistic" and Pilkington Bros. found "no industrial logic" in the bid from BTR and that "it does not agree with the future and wealth of British companies". As part of their defense tactics, they all announced profit and dividend forecasts.

Furthermore, the directors of Haden defending their company

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[6] Such defense actions as those reported by Sudarsanam (1991) and mentioned in section 1.2 of chapter 1.

[7] The source of these comments and defense tactics used in hostile bids has been the Investor's Chronicle. The same source was employed for friendly bids.

proceeded in a Management Buy Out (MBO)[8] via Electra & Globe Investment Trust, Savoy Hotels applied a system of dual voting structure which enabled Savoy to remain independent although THF nearly acquired the 70% of the equity. Finally the management of McCorquodale fighting against Norton Opax decided to make an Leveraged Buy Out (LBO).

On the other hand, **friendly** bids are bids which have been agreed and recommended by the target's management before the actual offer had materialised or soon after it. These bids often obtain positive comments from the management of the target, such as that the bid has real value or that it makes industrial sense etc. A number of large bids during the late 1980's fell into this category. For example, the agreed mergers of H.Samuels with Ratners in 1986, THF with Kennedy Brookes in 1988, BHS with Habitat Mothercare in 1985, GEC with Croda in 1987, APV Hdgs. with Baker Perkins in 1987 and Thomas Tilling with Liner Concrete in 1978.

Before, closing this section we should mention a possible **limitation** that is inherent in the definitions of hostile and friendly bids. This stems from the fact that the hostility or friendliness of the bid may not remain constant from the time of the announcement until the outcome date. Thus, the hostility of the bid and its degree may not be maintained throughout the battle because a successful defense on behalf of the target may force the bidder to make a more attractive offer or another bidder may appear whose terms are more acceptable to the target company.

A similar problem arises, in the case of friendly bids, because sometimes the management of the target company will recommend acceptance of an offer from a bidder, only to find

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[8] An MBO is another form of change in ownership and control by which the management acquires a part or the whole of their shares of their company. If the acquisition of shares is financed by debt then we have what is called a Leveraged Buy Out (LBO).

a second more attractive bid is made by another bidder which is accepted in place of the first one. However, these limitations do not seriously affect our results as we are interested in the effect that a hostile or friendly bid has at the time of the announcement and during the ensuing period and not only on the last few days before the outcome.

Finally, it is instructive to compare our definitions of hostile and friendly bids with those used in other studies. The main difference in our definitions and the definitions used in the samples of **Holl & Pickering (1988)** and **Limack (1991a)**, is related to the terms **hostile** and **contested** bid. We have endeavoured to give a more rigorous definition to the term hostile bid by requiring that such a bid is characterised by action on the part of target management which can be considered costly.

Holl & Pickering (1988) introduced contested bids rather than hostile and friendly bids. They considered a contested bid as one in which there was more than one bidder. However, in such a case one bidder may be friendly and the other hostile. Limack, however, discriminated between a bid which was internally contested (single bidder) and another one externally contested (multiple bidders), but did not define hostility in terms of defense strategies used. Only the definition employed by Parkinson & Dobbins (1989) coincides with ours because the failed bids included in their sample were also actively defended.

Since we have used bids from each of these studies it was necessary to use a uniform approach in our definitions in order to attain coherence and homogeneity in our sample. We have therefore scrutinized every bid we extracted from the samples of Holl & Pickering, Limack and Parkinson in order to classify it as friendly or hostile according to our definitions above.

4.3.2 Timing of events.

The **day of first announcement** and those of subsequent bids can be traced out from the financial press. It represents the day the bid offer first becomes known to the public. It can also be the day of the announcement that talks between the bidder and target are under way, though we excluded the cases in which bids were subsequently dropped. This date does not, of course, coincide with the actual date that the formal offer document reaches the target board. Also, the day of the announcement in the financial press is the day following the actual first announcement of the bid, so if we want to be specific we have to adjust for this difference by taking the previous day of the first public announcement as the day of the actual event.

The **date of completion** is taken to be the day the bid offer became unconditional[9]. When the bidder acquires more than 50% of the equity and obtains effective control of the target the bid is considered to be successful. If this specific day is not given, the month of completion is deduced based on information supplied by the Investor's Chronicle or the Financial Times. This problem only arises before 1975 when databases are not very consistent.

The **date of failure** is the day that the bid lapses. If this is not given directly by the Financial Times, or the Investor's Chronicle, or the Extel cards, it can be obtained from the fact that the Takeover Panel sets a time limit of 60 days beyond which the offer no longer holds. This time limit starts from the day that the bidder sends the formal

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[9] According to the City Code on Takeovers and Mergers when a bidder obtains more than 50% of the target's shares it has the option of letting the bid lapse or declaring it **unconditional**. The offer in a mandatory bid (it becomes mandatory if the bidder has already acquired the 30% of target's shares) has to go unconditional at 50%. The same also happens when the bidder has acquired more than 90%, because under the Companies Act the remaining shareholders must sell their shares to the bidder.

documents to the target. If the bidder has obtained less than 50% the bid is considered to have failed. Consequently, if a revised offer or a completion announcement after this specific day is not made we take this date to be the failure date.

4.4 Characteristics of the final sample.

Our initial sample was reduced from 622 bids to 354 bids, because of the following reasons :

1) The unavailability of data from LSPD for some companies, especially for those involved in takeover bids in the period 1963-1974.

2) For some companies LSPD did not give sufficient time series data either for bidders or for the targets in order to construct a 2 year estimation pre-bid period and a 2 year observation post-bid period.

3) The strict definition of hostile bids adopted further reduced the number of the bids in our sample since we had to drop some of the cases identified as contested in the samples of Holl & Pickering, Parkinson & Dobbins and Limmack we used.

4) We excluded the cases in which bidders became targets and the opposite within a period of six months.

5) We excluded bids made by the same bidder for the same or different target if they overlap in the same observation period. At this stage a minimum observation period of 6 months is taken, i.e. three months before the bid, plus the announcement month plus two months after the bid.

6) We dropped bids which were initially characterised as failed but subsequently acquired by another bidder (usually

a "white knight") within the observation period of two months.

Thus, we have a full set of information for 354 bids. Tables 4.2 and 4.3 show that from these bids 247 were completed, 107 failed, 163 were hostile and 191 were friendly.

Table 4.2 Mood of the bid

Sample period	Mood		
	Hostile	Friendly	Total number
1963 - 1975	23	26	49
1976 - 1985	87	86	173
1986 - 1989	53	79	132
Total number	163	191	354

Table 4.3 Outcome of the bid

Sample period	Outcome		
	Completed	Failed	Total number
1963 - 1975	30	19	49
1976 - 1985	113	60	173
1986 - 1989	104	28	132
Total number	247	107	354

4.5 An Outline of the Event Study Methodology.

Before describing the details of event study analysis, it is necessary to outline the fundamental assumption on which the event study methodology is based. This is referred to as the **market efficiency hypothesis.**

4.5.1 The Efficient Market Hypothesis.

According to **(Fama, 1976: 135)** an **informationally efficient market** is one "that instantaneously and correctly prices all securities, so that they can fully reflect all available information". Therefore, one can assume that in such a market the price of these securities is a fair one as it reflects their true value. This assumption is crucial for the event study analysis because what is basically examined is how quickly and correctly the market incorporates into the share price new information regarding the specific events such as takeovers. Furthermore, if the above assumption is correct then no investor can consistently make any abnormal profits or losses by trading on the basis of any information possessed.

In the Fama analysis market efficiency can be of weak form, semi-strong form or strong form. A market is **weak form efficient** when security prices fully reflect all historical information (e.g. movemement of prices in the past) and no investor can consistently earn abnormal returns on the basis of this information. A market is **semi-strong form efficient** when stock prices fully reflect all publicly available information (such as earnings reports, announcements of stock splits or takeovers, etc) and no investor can consistently make abnormal gains using this information. Finally, a market is **strong form efficient** when all available (public and non-public) information are fully reflected in security prices and no investor can consistently make abnormal gains even with the possession of inside information.

Empirical evidence suggests that the major stock markets in the USA and the UK successfully pass both the weak and the semi-strong form efficiency tests, though the evidence offered for the latter is not conclusive due to the existence of some market anomalies. Thus, in respect of the weak form efficiency tests, it was first **Alexander (1961)** and then **Fama & Blume (1966)** who found that technical analysis does not generate positive abnormal gains after adjusting for transaction costs. Semi-strong form tests were carried out first by **Ball & Brown (1968)** who showed that stock prices start to adjust to the release of publicly available information concerning annual earnings reports long before the actual announcement of these reports take place, so that no investor could have made abnormal gains on the basis of this information. Similar results were also discovered by **Fama, Fisher, Jensen & Roll (1969)** for stock splits and **Green & Seagal (1967)** for quarterly interim earnings reports.

However, empirical evidence does not support the strong form efficiency. Thus, **Firth (1972)** and **Jaffe (1974)** found that trading on the basis of private information produces positive abnormal returns, even after the subtraction of transaction costs. Therefore, stock markets are not strong form efficient or free of insider trading. However, in a market where the supervision by the Stock Exchange authorities is exercised rigorously and competition among traders and investors is high the degree of insider trading is reduced.

As regards to the announcement of takeover bids, which belong in the group of semi-strong form tests, it has been observed that the market starts to anticipate the imminent bid about 3-4 months before it actually occurs [**Franks, Broyles & Hecht (1977)**] due to pertinent information dispersed to the market through various channels (e.g. comments by financial journalists, etc). However, as shown

in chapter 3, the main informational content of a takeover is captured on the day or month of the first announcement. Thus, the share price on the announcement date can be said to correctly reflect the expected value of future cash flows of profits and dividends created by the takeover.

However, as mentioned above there is evidence for the existence of some stock market anomalies related with the semi-strong form tests. The most pronounced amongst these anomalies are the **small firm effect**, the **Monday or Weekend effect**, the **turn of the year effect** and the **overreaction hypothesis.**

The tendency of small firms to outperform the market index is known as the small firm or size effect and has been documented in many studies [**Bantz (1981), Levis (1989)**]. The drift of lower or negative returns on Mondays was observed by **French (1980)** and the fact that companies in January of every year experience higher returns was noticed by **Haugen & Wichern (1973)**. Furthermore, it has also been shown that markets have a tendency to overreact to both positive and negative information [**DeBondt & Thaler (1985)**].

The last anomaly is directly related to takeovers because as shown by various studies the bidding firms returns, which show close to zero gains on the announcement date, tend to be substantially negative in the post-merger period [**Jensen & Ruback (1983), Jarrell, et.al (1988)**]. This observation was considered by some researchers [**Ravenscraft & Scherer (1987a, b), Scherer (1988)**] as a sign of initial positive overreaction of the investors and consequently an indication of market inefficiency.

However, it is also equally plausible that the above anomalies, may be associated with a measurement error in the estimation of the abnormal returns due to the absence, to date, of a pricing model which can fully reflect all the

factors influencing the return and risk of a security. Therefore, on the basis of the evidence to date the market efficiency argument has a fairly broad base of support and therefore cannot be rejected, at least in its weak and semi-strong form.

4.5.2 Description of the Event Study Methodology.

Event Study methodology has been found to be an extremely useful technique in analysing the impact of a specific event on the share prices of the firms under scrutiny and has been extensively employed in many empirical studies. It was first used to examine events such as stock splits [**Fama, Fisher, Jensen & Roll (1969)**], earnings announcements [**Ball & Brown (1968)**], Initial Public Offerings (IPO's) [**Ibbotson (1975)**] and mergers [**Mandelker (1974)**]. Following these there has been a plethora of empirical studies, especially in the US employing the event study methodology.

The main idea of the methodology is that we examine the effect of the chosen event on the shareholder wealth of the companies examined at a specified **event date** and within an **event period.** The event date is usually either the date of announcement or the date of completion of the event. The data used can be measured monthly, weekly or daily. The methodology contains four steps, namely the **choice of event period and the estimation of actual, predicted and abnormal returns.**

4.5.3 The choice of the event period.

The event period usually consists of two sub-periods : the **estimation period**, which is a period before the day/month of the event's occurrence used to obtain the estimates of the prediction models applied, and the **observation period**, which usually starts 3 or 4 months before the actual event date, including the event date itself. The observation period

(also known as the event window) is the period over which abnormal returns are measured and the impact of the event is examined. It may also contain a post-event period depending on the aims of the research conducted.

The choice of each period is subject to the objectives of the empirical study and the frequency of data used. In studies employing daily data a one year estimation period is enough, whereas in those with monthly data the estimation period must be at least two years to provide a sufficient number of observations. The date of the event also varies among researchers. In the early years of applied event studies [e.g. **Fama, et.al (1969)**] there was a tendency to use the effective date (completion date) whereas in more recent ones, starting from the study of **Franks, Broyles & Hecht (1977)**, researchers have been inclined to use the announcement date because it has been discovered that the market anticipates the event and its effect quite a long time before it occurs.

For example, **Franks, et.al. (1977)** found that at least 3 months before the announcement date the market had begun to anticipate the event of mergers in the UK brewing industry. Information comes to the market from various sources such as financial reports about deteriorating performance, declining profits of companies which make them potential targets for takeover bids, news about share-stake building by a third party or directors, news about a large stake selling from a shareholder to a third party who might be a potential bidder, direct announcements in the press about merger talks and various speculations of press commentators.

Therefore, most of the empirical studies in the 80's further divided the pre-event period into a period which is unaffected by anticipation effects and a period of 3-4 months prior to the event date to allow for any unusual behaviour of share prices. It is commonly accepted that the

event day or month is denoted by t=0 ,the pre-event period is counted by t= -n,..0 and the post-event period by t=+1, +2, +3,..+n where n is the total number of days/months of the event period prior to and subsequent to the event.

4.5.4 The estimation of actual returns.

The actual return is calculated from the observed share prices of the company examined. The estimation of the actual returns is made during the whole period (estimation and observation period). As mentioned in the previous section, the estimation period usually starts three months (in the case of monthly data) before the announcement date in order to avoid any market movements in anticipation of the takeover event.

Thus, the **estimation of actual returns**, $\mathbf{R_{jt}}$ (where j=1,2,3,..N firms and t=1,2,3,..n days or months) is computed for each day/month of the estimation and observation periods as a combination of capital gains plus cash dividend, assuming that dividends are reinvested. R_{jt} is also called the actual or raw return and is given by the formula:

$$\log_e(R_{jt}) = \log_e\left(\frac{P_{jt}+D_{jt}}{P_{j,t-1}}\right) = \log_e(P_{jt}+D_{jt}) - \log_e(P_{j,t-1}) \quad (4.1)$$

where, $\mathbf{P_{jt}}$ is the price of the share of firm j at the end of month t and $\mathbf{P_{j,t-1}}$ is the price of the share in the previous month t-1. $\mathbf{D_{jt}}$ is the cash dividend of the jth security during month t (taken from the ex-dividend date and not from the payment date). When the price goes ex-dividend, then after this date investors who bought shares of the company are not entitled to receive the forthcoming dividend payout. $\mathbf{R_{jt}}$ is expressed in logarithmic form, so that our measure of return is continuously compounded. This also reduces the

problem of heteroscedasticity at the estimation stage [**Markowitz (1959), Fama, et.al. (1969)**].

4.5.5 The estimation of predicted returns.

The **estimation of predicted returns** is made in the observation period which begins three months before the announcement date and expands to the outcome date or the post-event period depending on the objectives of the empirical study. The main reason for predicting shareholder returns is that we want to estimate what the returns would have been in the absence of the event in order to be able to compare them with the actual returns after the event.

Four models, each of which is adjusted for risk, have been widely used in event studies to estimate the expected returns. These are the Capital Asset Pricing Model (CAPM), the market model, the mean adjusted return and the market adjusted return. The section which follows entails a description of the pre-mentioned models and highlights briefly their pros and cons. In our research we are going to apply three models, namely the market model, the mean adjusted and market adjusted return. However, we shall explain the CAPM because it forms the basis for the development of the market model.

1. **The Capital Asset Pricing Model (CAPM)**

CAPM was first introduced by **Sharpe (1964)** and **Lintner (1965)** to explain how the market evaluates capital asset prices under conditions of equilibrium[10]. It basically describes a positive relationship between risk and return. The risk here is the systematic or market risk which cannot be diversified away by portfolio diversification. The return

[10] The conditions of market equilibrium are based on the assumptions that first all investors can borrow and lend money at a common rate of interest and second that there is homogeneity of investors' expectations regarding the existing investment projects.

is represented by the expected return of an efficient combination of risky assets plus a riskless asset. The above can be expressed as :

$$R_{jt} = R_f + \beta_j(R_{mt} - R_f) \qquad (4.2)$$

where R_{jt} is the predicted return, R_{mt} is the return on the market portfolio, R_f is the return on a risk-free asset (β=0), such as the UK Treasury Bills and β_j measures the sensitivity of R_{jt} to movements of the market index. It represents the systematic risk which is not diversified away by portfolio diversification. It is equal to the covariance of R_{jt} and R_{mt} divided by the variance of R_{mt}. Furthermore, the difference between the R_{mt} and the R_f is called the **risk premium** and represents the excess return of the market index over a riskless asset that one should obtain (if he holds the market portfolio) to compensate for bearing the systematic risk (β).

The CAPM provides a useful tool in analysing and predicting the relationship between return and risk. However, it has a number of shortcomings. The most serious critique of CAPM has been made by **Roll (1977)**, who argued that the market index is an imperfect proxy for the true market portfolio and by **Fama & French (1992)** who provided evidence suggesting that the beta term was unable to explain market risk[11]. Nevertheless, CAPM and its derivative, the market model, provide the main framework which helps us to understand how markets price securities.

2. **The Market Model.**

The market model is derived from the CAPM and was first used by **Fama, et.al. (1969)** in their famous event study of analysing the effect of stock splits on share price. It expresses the same linear relationship between the

[11] A more detailed discussion of the limitations of CAPM and the market model follows in section 4.6.

security's return and the return on the market portfolio, i.e.

$$R_{jt} = \alpha_j + \beta_j Rmt + \epsilon_{jt} \qquad (4.3)$$

where R_{mt} is the return on the market portfolio (represented by a market index) at time t. This then can be expressed as:

$$R_{mt} = \frac{P_{mt}+DY}{P_{mt-1}} \qquad (4.4)$$

where P_{mt} is the price of the market index in month t and P_{mt-1} is the price of the market index in the previous month. The DY is the dividend yield (DY) on the index. More specifically it is a weighted average of the dividend yield of the constituent shares of the market index. In equation 4.3, α_j is an intercept term which measures the excess return over the market index (i.e. $\alpha_j=R_{jt} - \beta R_{mt}$), β_j represents the market risk (defined in the same way as in the CAPM) and ϵ_{jt} is a random error term which reflects that part of firm's returns which is not explained by movements in the market index. We assume that this term is homoscedastic, follows a normal distribution, has zero expected value and is serially independent.

The OLS estimator is applied to equation 4.3 during the estimation period after the variables have been expressed in logarithmic form. The results are then used to obtain predicted returns for the observation period. This is expressed by :

$$\log\hat{R}_{jt} = \hat{\alpha}_j + \hat{\beta}_j \log R_{mt} \qquad (4.5)$$

where the hat(^) shows that these terms are predicted estimates.

With the market model the returns of the jth firm are linked

to market movements so that the predicted returns depend both on each firm's specific characteristics and the market portfolio performance.

3. The Mean Adjusted Return Model.

In this model the predicted return is given as the average daily or monthly normal return for every firm over the pre-event period. The model assumes that each security will move in line with the mean of its historical return and will not be affected by market movements. Thus, β in equation 4.5 will be equal to zero. Thus, we have :

$$\log\hat{R}_{jt} = \log\overline{R}_j = \log\left(\sum_{t=-n}^{-4} \frac{R_{jt}}{n-3}\right) \qquad (4.6)$$

where $\mathbf{R_{jt}}$ is the predicted return for each firm j at time t, $\mathbf{R_j}$ is the average historical return for each firm j and the estimation period ends at the third month before the bid to allow for the market anticipation effect.

This method has the disadvantage that it fails to relate the firm's returns to the market movements and thus does not include the effect of other events except acquisition that might affect the company's share prices. However, it can be shown to be a superior method to estimate expected returns if for instance the risk characteristics of the companies involved change due to the merger event[12]. The mean adjusted return model will not be affected in this case because β=0.

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[12] There is evidence, at least in the US, that the acquiring firm's beta is usually lower than the acquired company's beta which is frequently a smaller company. Therefore, the acquisition may change the risk characteristics of the acquirer [**Haugen & Langetieg (1975), Mandelker (1974), Connell & Conn (1993)**] and using the pre-event betas may cause a bias in the results obtained.

4. Market Adjusted Return Model

This method assumes that the predicted return of each firm for every day/month of the observation period will be equal to the return of the market index (usually the FT-ALL Share Index) for each day/month of the observation period, i.e.

$$\log\hat{R}_{jt} = \log R_{mt} \qquad (4.7)$$

where : $\hat{\alpha}_j = 0$

$\hat{\beta}_j = 1$ for all firms

The R_{mt} is the same as in equation (4.4).

This method entirely relates the predicted return with a control group (via the market index)[13]. It has the drawback of not relating the specific characteristics and returns of each security with those of the control group, but has the advantage of not suffering from the α's and β's instability problem, since it has been discovered [**Connell & Conn (1993)**] that shifts in α's in the post-merger period are responsible for 80% of the changes in the abnormal returns. However, assuming that the beta is equal to unity we may underestimate or overestimate its true value for the companies examined.

4.5.6 <u>The estimation of the abnormal returns.</u>

This is the final step of the event studies approach in which we attempt to capture the change in the value of shareholder wealth due to the takeover bid in terms of abnormal returns. The abnormal or excess return or

[13] This index is used as a proxy for the market portfolio. The market portfolio can be either value weighted (in which the weight of the security of each firm is given according to the market capitalisation of each firm) or equally weighted (equal weight is given to each security).

prediction error[14] represents the difference between the actual return (R_{jt}) on the share prices of the companies examined and the predicted return (R_{jt}). This difference (also called the residual) will reflect the impact of the specific event being investigated. Thus, the **abnormal return** (AR_{jt}) can be expressed as:

$$AR_{jt} = \hat{R}_{jt} - R_{jt} \qquad (4.8)$$

We compute the residuals prior to and subsequent to the merger event. However, we are interested in examining the residuals only for the observation period. For each day/month during the selected event period residuals are estimated for every firm in order to find the **average residual** or **Average Abnormal Return (AAR_t)** for that specific day or month. It is expected that there will be different calendar days/months of event for different firms or even different days for an individual firm.

The AAR_t is the average of the abnormal returns of all the firms for each day/month. It can be expressed as :

$$AAR_t = \sum_{j=1}^{N} \frac{AR_{jt}}{N} \qquad (4.9)$$

where j=1,2,3...N is the number of firms in the sample.

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[14] The traditional terms which have been used in the literature to describe the wealth effects from takeovers were the Abnormal Return (AR) and the Cumulative Abnormal Return (CAR). It has become popular in many studies after 1985 [eg **Lewellen, et.al (1985)**, **Varaiya (1985)**, **Lang, et.al (1989)** and **Datta, et.al (1992)**] to use of the term Prediction Error (PE) and Cumulative Prediction Error (CPE). However, these studies only used the market model and in this context the term is justified. In our case however, we employ various models and therefore it is more appropriate to use the traditional term of abnormal returns.

Having calculated the AAR's we can then find the cumulative sum of AAR's for each day/month which is called **Cumulative Average Abnormal Return (CAAR)**. The CAAR provides a picture of the cumulative effect of the event over a period of time under observation. It is given by the formula :

$$CAAR_t = \Sigma^{T}_{t=-n} AAR_t \qquad (4.10)$$

where -n is the starting point of the observation period and T the final number of days/months in the event period.

4.6 A Brief Critique of the Event Study Methodology.

Despite the popularity of event study approach it is subject to a number of criticisms which need to be addressed. The first is that **the results depend on the choice of the event dates** which are arbitrarily determined. **Franks, et.al. (1977)** used both the announcement and effective dates and showed that when the effective date was used they obtained lower abnormal gains than those obtained for the announcement date because the market had anticipated the bid. In recent studies this problem has been solved by taking the date of the first announcement.

The second problem is that **the results also depend on the chosen length of the estimation and observation periods.** Because the characteristics and performance of the firms may change over time and with them the risk and return characteristics will change too. Referring to the market model parameters the α_j and β_j may differ depending on the length of the pre-event period. The longer the estimation period, the higher is the probability that risk and return characteristics will change over time[15]. Several studies

[15] However, the market adjusted return model suffers to a lesser extent from this problem as long as the α term which incorporates the historical return of securities is set equal to zero.

such as those of **Franks & Harris (1989), Magenheim & Mueller (1988)** have demonstrated the existence of this problem. The latter study provided evidence suggesting that a high performance of acquirers in a more recent pre-event period of 2-3 years will result in a bias producing higher abnormal returns in the observation period because the predicted returns will be based on a higher α_j.

The choice of the **event window** (observation period) is again arbitrary. Some researchers may chose the announcement month, others may include the outcome month, and others may examine the post-outcome period. For example, **Ruback (1988)** examined the performance of target companies using a 3 year post-event period. He argued that it is better to take the longest possible post-announcement period in order to capture the impact of the takeover bid in the long run. However, this has the disadvantage of increasing the bias in the abnormal returns obtained due to the shifts in α's and β's of the market model. Therefore, **Brown & Warner (1980)** suggested the use of short estimation and observation periods. Also, **Dimson & Marsh (1986)** showed that the size effect problem-which is to be explained shortly-is minimised when the observation period is very short.

Third, **the risk characteristics may change in the post-merger period** as a result of the acquisition. A different size, or level of gearing between the acquirer and acquiree and the different type of industry that they belong may imply a different level of risk for the companies combined. This suggests, for example, that the acquiring firm's risk characteristics may increase in the post-merger period due to the higher risk characteristics of the acquired firm which may be a smaller and highly geared company. In this case, the estimate of the acquiring firm's β, calculated in the pre-event period by the market model, will be different from the corresponding β in the post-event period and hence it will be inappropriate to use the pre-event beta to

estimate the predicted return.

Fourth, **the validity of the market model and the CAPM has been questioned.** These models have received serious criticism in the past regarding their ability to explain the variation of return and risk and their interrelationship. In the past, most of this critique has been focused on the omission of other factors from the model that can explain the rate of return resulting in market anomalies.

For example, **Bantz (1981)** proposed the existence of the so-called size effect while **Basu (1983)** and **Ball (1978)** found that price/earnings ratios can explain the cross-section variation of average returns. Also, **Ross (1976)** developed the idea of arbitrage pricing theory which assumes that the rate of return on any security depends on many other factors as well as the market index. Furthermore, **Chen, Roll & Ross (1983)** based on arbitrage pricing theory constructed a multi-factor model which included several macroeconomic factors, in addition to the market index, such as an industry index, yields in corporate and government bonds, unanticipated inflation, interest rates, etc.

Nevertheless, it was not until recently that the essence of the market model was seriously questioned. This time the critique did not simply highlight the omission of some factors from the model but questioned the inability of the model itself to explain the relationship between risk and return. Thus, **Fama & French (1992)** using monthly data and examining several portfolios in the period 1941-1990 discovered that beta cannot satisfactorily explain the market risk even without the presence of other variables in the model and that the positive relationship between return and market beta cannot be confirmed. In other words, a higher beta does not imply a higher return and vice versa.

However, a recent empirical study of **Kothari, Shanken &**

Sloan (1993) using annual data offered contradictory evidence to the Fama & French results by showing that beta can still explain a part of the cross-sectional variation of expected returns. Furthermore, they showed that the book-to-market equity ratio cannot easily substitute the beta as Fama & French argued[16] and therefore, it is rather premature to reject the validity of the market model.

The fifth problem is referred to as the **clustering problem.** This occurs when the event date of one security falls in the same calendar day with the event date of another security. This increases the cross correlation of securities and the variance of performance measures (e.g. the average residuals and betas) which in turn reduces the power of our tests. Therefore, clustering must be avoided where possible and the procedure of standardisation of residuals must be undertaken. This issue is addressed further in section 4.7.1.

Finally, the results of event studies are also sensitive to sample size. It is therefore important to have access to as large a sample as possible and for firms to have been chosen randomly from this sample.

The limitations discussed above do not invalidate the event study methodology, but rather highlight those factors that should be taken into account in order to make correct use of the methodology and hence to enhance the robustness of our results. This is the theme developed by **Brown & Warner (1980, 1985)** who showed that under specific conditions (i.e. large samples randomly chosen, relatively short estimation

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[16] Kothari, et.al (1993) showed that the opposite results of Fama & French regarding the book-to-market equity ratio may have been due to a survivorship bias in the Compustat data which gives higher returns for small companies stocks. In contrast with the CRSP tapes, Compustat tapes do not contain data for many of the small firms facing financial distress.

and observation periods and less event uncertainty) the methodology and especially the market model performs well in correctly estimating abnormal performance.

Therefore, in the light of the above remarks we attempted to alleviate the effect of the limitations mentioned, by taking a large sample of 354 bids, although not entirely randomly chosen[17], with minimal event uncertainty (since monthly data were used), with not too long an estimation period (3 years), excluding CAPM and avoiding the clustering effect as far as possible. Furthermore, although we take a long observation period as well as a short one, we shall emphasise in our analysis the results generated in the short period. We also examined the extent of the size effect in our sample and made the necessary thin trading adjustments. All these issues are to be discussed in further detail in chapter 5.

Based on the suggestions made by **Brown & Warner (1980, 1985)** and **Dimson & Marsh (1986)** we consider that the market model gives the most reliable results compared with the other models when the prementioned conditions are kept. However, we shall test the impact of takeovers on shareholder's wealth using the market model as well as the mean adjusted and the market adjusted return model in order to examine if the results are sensitive to the choice of model.

4.7 Some econometric Issues.

The section which follows presents the tests of statistical significance applied in a standard event study analysis and discusses the size effect and the thin trading problem. An investigation of the existence of the size effect and the thin trading problem in our sample, along with the solution applied, is given in chapter 5.

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[17] We excluded companies from the financial, commodities and property sectors.

4.7.1 Tests of statistical significance of the AARs and CAARs.

It is not enough to calculate the AARs and CAARs in order to reach conclusions concerning the impact of takeovers on shareholder's wealth. These abnormal returns have to be tested for statistical significance as well. We have to test the null hypothesis (H_0) that abnormal performance is absent against the alternative (H_1) that it is present.

To obtain a valid t-statistic in order to choose between these two hypotheses it is necessary to satisfy the requirement that the residuals (abnormal returns) in our portfolio must have constant variance. If this condition does not hold, the variance will be underestimated or overestimated because of the **clustering effect** in which more events occur in some calendar days/months than in others. To obtain the same variance for each portfolio residual we need to divide the abnormal returns of the observation period by their variance of the estimation period. This procedure is called **standardisation of the abnormal returns** and has been applied consistently in many event studies [e.g. **Mandelker (1974), Ellert (1976), Dodd & Ruback (1977), Firth (1980), Afshar, et.al (1992)**].

Brown & Warner (1980, 1985) established t-statistics asssuming first **cross-sectional dependence** and second **cross-sectional independence** of abnormal and cumulative abnormal returns aiming to test if the abnormal returns are statistically significant. We adopt the same approach suggested by Brown & Warner.

1) Dependence Assumption

By estimating the average abnormal return (eq.4.11) for the observation period (t=-3,..,T) across securities and dividing it by its variance of the estimation period (t=-n,..,-4), we assume that there is cross-sectional correlation among the abnormal returns. The t-statistic for

each event month is :

$$t_{AAR} = \frac{AAR_t}{S(AAR_t)} \qquad (4.11)$$

where AAR_t = the average abnormal return, from equation (4.9) and the standard error of AAR_t is given by

$$S(AAR_t) = \sqrt{\sum_{t=-n}^{-4} \frac{(AAR_t - \overline{AAR}_t)^2}{(t-1)}} \qquad (4.12)$$

and t-1 = the total number of months of the observation period minus one degree of freedom.

$\overline{AAR}_t$ is obtained by averaging the AAR_t [from eq.(4.11)] over t of the observation period, i.e.

$$\overline{AAR}_t = \sum_{t=-n}^{-4} \frac{AAR_t}{t} \qquad (4.13)$$

The t-statistic for the CAAR's (eq.4.10) is given by

$$t_{CAAR} = \frac{CAAR_t}{\sqrt{T} * S(AAR_t)} \qquad (4.14)$$

where T = the total number of months of the observation period.

2) Independence assumption

By taking the abnormal returns for every security across the observation period and dividing them by their variances during the estimation period we assume cross-sectional

independence.

Thus, the standardised abnormal return (SAR) is :

$$SAR_{jt} = \frac{AR_{jt}}{S(AR_{jt})} \qquad (4.15)$$

where AR_{jt} = the abnormal return during the obervation period, from equation (4.8) and

$$S(AR_{jt}) = \sqrt{\sum_{t=-n}^{-4} \frac{(AR_t - \overline{AR}_t)^2}{(t-1)}} \qquad (4.16)$$

where t-1 = the total number of months of the observation period minus one degree of freedom and

$$\overline{AR}_t = \sum_{t=-n}^{-4} \frac{AR_t}{t} \qquad (4.17)$$

over t of the observation period. The t-statistic for any event month is given by :

$$t_{AR} = \sum_{j=1}^{N} \frac{S(AR_{jt})}{\sqrt{N}} \qquad (4.18)$$

To calculate the t-statistic of the CAARs for the independence assumption, we must first calculate the cumulative abnormal returns i.e.

$$CAR_t = \sum_{t=-3}^{T} \frac{AR_t}{T} \qquad (4.19)$$

We then standardize the CARs :

$$S(CAR_t) = \frac{CAR_t}{S(AR_{jt})} \qquad (4.20)$$

where $S(AR_{jt})$ is given by equation (4.16).

Finally, the t-statistic for the CAAR is given by :

$$t_{CAR} = \sum_{j=1}^{N} \frac{S(CAR_t)}{\sqrt{N*T}} \qquad (4.21)$$

where T = the total number of months of the observation period and N = the total number of firms

Brown & Warner (1985) claimed that when there is a large clustering effect and consequently high positive cross-sectional correlation it is essential to make the dependence adjustment if we do not want to underestimate the variance and hence to obtain high values for t-statistics thereby increasing the probability of making a type I error, i.e. rejecting Ho when it is true. However, when the samples are randomly chosen and if the degree of clustering is low and hence the size of dependence is small, it is better to assume independence because this will increase the efficiency of the variance estimator. In our case the sample is not randomly chosen due to data unavailability problems, exclusion of banks, foreign firms, etc, and the clustering effect cannot be completely avoided. Therefore, a t-statistic based on the dependence assumption is expected to give more reliable results.

4.7.2 The size effect.

It has been demonstrated in many studies, such as those of **Bantz (1981)**, **Reinganum (1981)**, **Schwert (1983)**, **Brown, Kleidon & Marsh (1983)**, **Dimson & Marsh (1986)** and **Levis (1989)**, that firms with small market capitalisation outperform the market index. This phenomenon is one of the market anomalies which has puzzled researchers for years and until now a complete answer to this problem has not been given.

This market anomaly is of particular interest in takeover studies as target companies are usually smaller companies than bidding firms. Thus, it has been observed [e.g. **Asquith, et.al. (1983)**, **Franks, Harris & Titman (1991)**] that the small firm effect can explain a part of the high abnormal returns realised by the target companies in takeovers. It was argued by **Dimson & Marsh (1986)** that the results given by the market model are influenced by the small firm effect because the omission of size biases the α's and hence the predicted abnormal returns. This bias can be trivial in very short event windows (e.g. announcement month) but can be magnified and become important when a long event window is taken (e.g. 3 years).

In their empirical work, **Dimson & Marsh (1986)** proposed three solutions to the small firm effect problem. First, avoid extremely long estimation and observation periods especially in the case of monthly data, because they can increase the variability of alphas and betas. Second, avoid CAPM, because abnormal returns are based on the small-firm premium which is sensitive to the size effect. Third, either avoid including in our portfolio small securities which will differ systematically from the constituents of the market index[18] or adjust this market index benchmark to the

[18] The market index such as the FT-ALL Share Index is an imperfect proxy for the market portfolio because it includes only the 700 largest companies in the UK. Thus, using this

securities of the sample.

The last approach is more effective, because it does not introduce bias of large companies in the sample. The adjustment is made by splitting the sample of securities and the market index into deciles according to their market capitalisation and performing the empirical tests across the deciles. **Franks, et.al. (1991)** and **Brown & Rossa (1992)** followed this technique in examining the abnormal returns created from takeovers.

Our main analysis in chapters 6 and 7 will be focused on a short event window and in this case, as Dimson & Marsh (1986) argued, the size effect bias does not cause a serious problem. Therefore, it is not in the purposes of our study to make the above explicit adjustment for size, although we consider it necessary to investigate the extent of small firm effect in our sample by examining the size, in terms of market value, of the bidding and target companies. Our approach is discussed in detail in section 5.3.3 and appendix 5.2 of the next chapter.

4.7.3 Thin trading problem.

This problem emanates from the non-synchronous trading between securities which are not frequently traded and securities frequently traded which are included in the portfolio benchmark. The tendency of any security is to record the price of the last transaction. However, if the price remained the same for a number of time periods due to infrequent trading then any attempt to measure the returns using the market model will generate biased and inconsistent OLS estimates. Positive serial correlation is induced in the returns measured and downwards biased estimates of betas are

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benchmark against the target companies, it will generate higher abnormal returns for these companies and lower ones for bidding companies due to the size effect.

obtained by the market model for the thinly traded securities [**Dimson (1979)**]. This phenomenon can be particularly severe in the case of daily data. The thin trading problem is related to the small firm effect, because companies which are infrequently traded are usually smaller companies. Consequently, this will cause a lower beta especially for target companies.

In the risk measurement literature, there have been several procedures to minimise the effect of the above problem. The main approaches are those applied by **Scholes & Williams (1977)**, **Dimson (1979)** and **Fowler & Rorke (1983)**. The main objective of the procedures adopted in these studies is to reduce the downwards bias in the beta estimates of the infrequently traded securities by regressing a combination of synchronous and non-synchronous market returns on each of the securities returns examined. The Dimson method has the advantage that it does not require the knowledge of the exact transaction dates. However, in our study we apply all of them and we discuss them in detail in appendix 5.3 of chapter 5.

4.8 Summary and Conclusions.

This chapter is directly connected to the next chapter since it presents the data and the methodology used to measure the creation of wealth gains in takeover bids. The chapter began by describing the way we extracted and set up our database of 354 bids. Then an outline of the event study methodology was given exposing the foundations, stages and limitations of this analysis. Four models, namely the CAPM, the market model, the market adjusted return and the mean adjusted return model, were described highlighting their advantages and disadvantages.

Despite its limitations event study methodology remains a flexible and useful tool in estimating the impact of

takeovers on shareholder's wealth. The above analysis is especially valid when event uncertainty and clustering effects are minimised, random samples are chosen, relatively short periods are used for the estimation of predicted returns and CAPM is avoided. Furthermore, empirical evidence suggests that the market model still provides a valid framework for the estimation of abnormal returns.

Finally, some econometric issues of our approach were highlighted, such as the tests of statistical significance of the abnormal returns obtained from event study analysis based on dependence and independence assumptions, the size effect and the thin trading problem. The specific way we dealt with these problems in our research is explained in the next chapter.

CHAPTER 5

DO MERGERS CREATE VALUE ?

5.1 Introduction

This chapter examines whether takeover bids increase the value of shareholder's wealth of bidding, target and combined firms. Value is measured in terms of share-price abnormal returns estimated by event study methodology. We shall also examine the division of gains between bidders and targets and the total gain or loss for the combined firm. Positive abnormal returns will suggest that takeovers are a value increasing activity while negative abnormal returns will suggest the opposite.

Furthermore, we distinguish between completed and failed bids aiming to investigate whether bidder and target shareholders are better off in completed or failed takeovers and, if so what are the possible source of these gains. If the gains realised in completed bids are higher than for failed bids, then various synergies are likely to be the source of these gains but if the opposite is true the source is more likely to reflect the existence of information assymetries.

We begin the chapter discussing our hypotheses and data. Then, we present in detail some methodological issues such as the choice of the estimation and observation period, the choice of the models to calculate the abnormal returns, the size effect and the thin trading problem. The fourth section contains the results obtained for bidding companies by applying the event study methodology. The fifth and sixth sections show the results obtained for target companies and the combined firms (total returns) respectively. The seventh

section discusses and compares our results with the findings of other empirical studies. Finally, in the last section some conclusions are drawn with respect to our hypotheses.

5.2 Hypotheses and Data.

5.2.1 Hypotheses

As we can recall from chapter 2, two of the main merger theories are the profit-maximisation and managerial theories. The first group of theories predict that mergers in general are a value increasing activity taken by managers seeking to enhance the economic efficiency of their companies. As we saw in chapter 3, the majority of event studies, however mostly US ones, have confirmed the profit-maximisation theories showing that bidding companies do not lose, target firms make large gains and the overall result of takeover bids is an increase in the value of the combined firm.

On the other hand managerial theories predict that mergers in general are a value decreasing activity; managers pursue their own self-interests and the acquisition of other companies is one way of achieving this. As mentioned in chapter 3, the majority of studies using accounting data have shown that acquiring companies suffer losses, target companies do not gain and the overall result of merger activity is negative. In other words, these studies have confirmed the predictions of managerial theories. In the light of the above we set our first hypothesis as follows:

> **H1 :** Target companies experience significant gains in takeover bids while bidding firms make non negative gains in the period surrounding the announcement of bids. If this is correct then we should also expect that the overall value of the combined firm will increase during the same period of time.

Evidence in favour of this argument will give support to the profit-maximisation theories.

Another issue considered in this chapter is whether completed bids generate higher wealth gains than failed bids. Looking at the differences between completed and failed bids will enable us to find what is the possible source of takeover gains. However, this will be only a first attempt to identify the potential sources of takeover gains because this issue will be further discussed and explored in chapters 6 and 7 using a multiple regression analysis framework.

Jensen & Ruback (1983) reported that the majority of the US studies reviewed found that bidding and target firms realised higher gains during the announcement period when the takeover was completed than when it was abandoned. Based on this, they argued that the source of gains appeared to be the expected synergies. **Bradley, Desai & Kim (1983)** argued that in order to identify the source of gains in takeover bids one has to examine the post-bid performance of target firms in abandoned bids and distinguish between those targets who received a subsequent bid and were acquired and those targets who did not receive a bid and remained independent. By doing that, they found that target companies who were subsequently acquired obtained higher returns than target firms who survived in the post-bid period suggesting that the market expects future synergies to arise in completed takeovers.

On the other hand, **Limack (1991b)** adopting the same approach as **Bradley, et.al. (1983)** in examining the failed bids found that target companies which remained independent realised higher gains than those which were acquired. This suggests that these companies had been undervalued prior to the bid and the release of new information during the announcement period leads to a permanent upwards revaluation of their

shares. Based on this argument information asymmetries are more likely to be the potential source of gains. In respect of the above we set three hypotheses.

H2 : Completed takeovers generate larger gains for bidding and target companies than failed ones, both during the announcement and the post-outcome period of bids.

H3 : Furthermore, target companies which are subsequently acquired in the post-outcome period experience higher gains than target companies which remain independent.

H4 : Bidding companies who successfully merge with their targets make higher gains than those bidders who fail to acquire their targets which are subsequently acquired.

If these three hypotheses are correct it is more likely that the source of gains will be expected synergies rather than the release of new information about the real value of targets. Moreover, if H4 proves to be true then this will suggest that the market favours a combination of assets which is specific to a certain bidder and target. This is an indication of potential unique synergies [**Limmack (1991b)**]. It is equally possible that, this may occur because the market considers the bid abandonment as a sign of bidder's weakness and negatively evaluates the prospect of acquisition.

5.2.2 Sample.

The whole sample of 354 bids described in section 4.4 of chapter 4 which covers the period 1963-1989 was used to estimate the abnormal returns of bidding and target firms.

One of the objectives of this study is to estimate the total gain made by the combined firm. In order to do so, we had to estimate a total return measure which adjusts for the different size in terms of market value between bidders and targets. This procedure is explained in detail in appendix 5.1 at the end of this chapter. However, due to the unavailability of market value data for the majority of target companies before 1979, the above sample was further reduced to 253 bids covering the period 1979-1989. Thus, we estimate and report in section 5.6 the abnormal gains of the combined firms for the reduced sample of 253 bids during the 1979-1989 period[1].

Both samples include completed and failed bids. However, due to the fact that we look also at the post-bid performance of bidding and target firms in order to identify the potential source of takeover gains, we had to distinguish, as **Bradley, et.al. (1983)** did, between those target companies that remained independent during the post-outcome period and those companies that were acquired during the same period.

Therefore, in addition to the definition of a successful bid given in chapter 4[2], we introduced another one here examining three categories of bids. The first contains those bids completed within a period of 2 months after the first bid, the second contains those bids completed within a 2 year post-bid period and the third contains the bids for the target companies which remained independent throughout the 2 year post-bid period. We call the first group **Completed1**, the second **Completed2** and the third **Failed**. From the whole

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[1] From this sample of 253 bids, 238 bids are used for the analysis that follows in chapters 6 and 7. The further reduction in the number of bids examined is due to unavailability of some of the accounting data.

[2] In chapter 4 (section 4.3.2) we considered a bid as failed if the first or a rival bidder does not acquire the target company within a period of two months after the announcement month.

sample of 354 bids, 251 belong in the Completed1 group, 16 in the Completed2 and 87 in the Failed category. Accordingly, from the reduced sample of 253 bids 190 are in Completed1, 13 in Completed2 and 50 in Failed groups.

Share price data for the securities of bidding and target companies in our sample and the FT-ALL Share Index (the benchmark portfolio) for both samples were obtained from LSPD[3]. These data are in the form of monthly logarithmic returns[4] assuming that dividends are reinvested.

5.3 Methodological issues

5.3.1 Choice of event periods.

An **estimation period** of 36 months was used to obtain the parameters of the market model, the market model adjusted for thin trading and the mean adjusted return model in order to calculate the predicted returns. The estimation period ends at the end of the fourth month before the month (0) of the first announcement month in order to exclude any market anticipation effect. We have set the restriction that a company should be included in the sample only if it had at least 24 months share price data before the bid.

The main objective of our research, as mentioned in the previous section, is to find the impact of takeovers surrounding the bid period. Therefore, we decided to give an emphasis in examining mainly **two event windows**. The first includes the months in the pre-announcement, announcement and outcome period (-3, +2) and encapsulates the total impact of a takeover bid from the time the market started anticipating it (about 3 months before the bid) until the outcome month (usually the outcome of a bid has been

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[3] The data were extracted from LSPD using the ACROBATS system of the Computer Unit of the University of Bath.

[4] The returns are estimated in the way described in equation 4.1 of chapter 4.

determined by the second month after the announcement month). The second contains only the announcement month (0). According to the market efficiency hypothesis the use of these windows would be adequate to evaluate correctly the value created in takeovers.

However, because we also want to investigate the source of takeover gains we have to look at the differences between completed and failed bids of bidding and target companies in the long run as well as in the short run. This caused us to choose a **third event window**, which examines a period of 24 months after the bid outcome date. It starts from the third month after the bid, in order to exclude the effect of the announcement and outcome period and ends 2 years after, i.e. (+3, +26). Thus, the total number of event windows reported is three[5]. Since these windows are to be found in most of the previous published studies (table 5.8) direct comparison with previous research is possible.

5.3.2 The models used.

The methodology used for the estimation of the Average Abnormal Returns (AARs) and Cumulative Average Abnormal Returns (CAARs) is the standard event studies analysis which has been extensively described in the previous chapter. We decided to report the CAAR's using only the **market model adjusted for thin trading**. As shown by **Brown & Warner (1985)** the market model under certain conditions is more appropriate to estimate correctly the abnormal returns. As we can recall from section 4.6 of the previous chapter, these conditions are the absence of event uncertainty, a large sample randomly chosen, short estimation and observation periods, avoidance of CAPM and no clustering effect. Since most of these conditions are kept in our

[5] In addition to the above, results were initially generated for other event windows such as (-3, -1), (-3, 0), (0, +2) and (0, +26), but these are not reported here.

analysis the market model can be recommended. Moreover, as recent research showed [**Kothari, et.al. (1993)**] the market model is still valid in spite of the criticism it has received in the past about its inability to explain the relationship between risk and return. Adjusting the market model for the problem of infrequent trading is a procedure that should further increase the robustness of our results.

However, in order to test if the results are sensitive to the choice of model we used three other models to estimate the excess (abnormal) returns. The first model used is the **market model (not adjusted for thin trading)**, the second is the **market adjusted return model or market index model** (in which α=0 and β=1) and the third is the **mean adjusted return** (in which α=0 and β=0). We found that the results generated with the other models are not in general substantially different from those generated by the market model adjusted for thin trading and therefore we decided to present them in appendix 5.4.

We report the CAARs[6] first for bidders and second for targets. In the reduced sample 1979-1989 we estimate the total CAARs (returns of the combined firms). The procedure of calculating the total abnormal returns is explained in appendix 5.1 at the end of this chapter.

5.3.3 The size effect.

It is expected that the size effect, if it exists, is likely to affect the results reported by the market model adjusted for thin trading for the long term performance of companies examined in the third event window (+3, +26). As mentioned in the previous chapter, the size effect does not cause a

[6] The estimation of the abnormal returns was made using MINITAB computer programme whereas the calculation of the AARs, CAARs and the tests of statistical significance carried out by SAS.

serious bias in the abnormal returns when the observation period is short. The size effect, according to **Dimson & Marsh (1986)**, will also depend on the extent to which the sample is composed of very large or very small firms. For example, in a sample that includes companies of average size the size effect bias will be limited. Therefore, we considered it necessary to investigate the size of the bidders and targets in our sample.

Using size deciles[7] for every year, we estimated the frequency distributions of the bidding and target companies in our sample based on their market value. We can observe from table 1 and graph 1 of appendix 5.2 that in general only a very small proportion of bidding and target companies comes from the lowest decile. Looking at the same table and graph of appendix 5.2, we can also see that target companies exhibit a more symmetric distribution (concentrated in deciles 5, 6, 7 and 9) than bidders which seem to be concentrated in the largest deciles especially, decile 10.

The FT-All Share Index, which we use as the portfolio benchmark, contains the largest UK firms and as a value weighted index is likely to give more weight to larger companies who may be poor performers. Thus, using this index we should expect that small firms will obtain relatively higher returns whereas large firms will experience lower returns. On the other hand, the fact that the effect of very small target firms' stocks (belonging in the decile 1) is substantially reduced implies that an upwards bias in the abnormal returns for target companies may be limited, but there will still be some downwards bias for the bidding firms who are on average large firms. About half of the total number of bidding companies, i.e. 153 out of 354

[7] These size deciles were constructed by Dr. M.Levis who provided them for me. Size is measured by the market values of all the existing companies in LSPD for every year since 1955. Then I classified the companies of my sample into deciles depending on their market capitalisation.

belong to the highest decile.

We consider that, since our primary objective in this chapter and the subsequent chapters is to examine takeover bids within a short observation period, we do not need to make a full adjustment for size such as that made by **Brown & Rossa (1992)** which would require estimating the abnormal returns for each of the size deciles. However, we are aware that, since we also look at a 2 year post-event period, we should expect some sort of downwards bias in the CAARs of bidding companies.

Although, **Dimson & Marsh (1986)** showed that the choice of a different index such as an equally weighted or a small companies index did not eliminate the size effect bias, we decided to use two other indices in order to test the sensitivity of our results to the choice of the portfolio benchmark. The second index used in our study was the **Hoare Govett Small Companies (HGSC) Index.** The HGSC Index is an arithmetic value weighted index (we transformed it into a logarithmic return form) provided by Hoare Govett financial services company in daily and monthly form. We took the index in monthly form from the relevant prospectus of the company.

The index contains all the small companies falling in the lowest decile of market value, which count for about 75% of all the companies listed on the London Stock Exchange, and is used to monitor the performance of small companies. The HGSC Index during the period 1955-1989 has consistently outperformed the FT-All Share Index. By taking such an index we should expect a large downwards bias for both targets and bidders. Our findings confirm the direction of the bias, but they do not exhibit a large deviation from the returns obtained by the FT-All Share Index and therefore we decided against reporting these results.

Finally, we used an **Equally Weighted (EW) Index** of all the listed companies since 1955. This index was given in logarithmic form including dividend yield. We decided that the EW Index[8] should not incorporate the companies in decile 1 (companies with the lowest market capitalisation), because of the frequency distribution of the companies specific to our sample. Furthermore, the firms included in this decile are very small companies having the tendency to show different financial performance and characteristics from other companies.

By incorporating this index which gives equal weight to small and large companies we would expect that the bias will be reduced. In other words, smaller companies which in our case are the target companies will have lower returns than they would have with FT-ALL Share Index and large companies, which are the bidders, will have higher returns. As expected, target companies performed at a lower level and bidders at a higher level compared with the FT-ALL Share Index. However, except from the market adjusted return model which gave substantially higher returns to bidders the other models with an EW Index do not show a significant difference from FT-All Share index and we again decided not to report these results.

In conclusion, we showed that the results obtained by the market model are not sensitive to the choice of the market index and we did not gain by chosing a different index than the value weighted FT-All Share Index. This finding is in accordance with the **Dimson & Marsh (1986)** and **Brown & Warner (1980)** studies which showed that both indices give similar biased results, but that the bias is smaller when the market model is used and when a short event window is employed to measure abnormal performance.

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[8] This index was also constructed by Dr. M.Levis and given to me.

5.3.4 The thin trading problem.

As explained in section 4.7.3 of chapter 4, some securities suffer from the thin trading problem which causes serial correlation in the returns estimated over the pre-event period. This causes a downwards bias in the betas estimated by the market model which in turn generates an upward bias in the abnormal returns over the observation period. Securities which are more vulnerable to this thin trading bias are those of small firms and since target firms are more likely to be small firms it follows that, at least for the target firms, we have to make the necessary adjustment to the market model in order to minimise the effect of this problem. However, bidding firms securities may also be affected by the thin trading bias.

Therefore, we decided to investigate which of the securities in our sample had experienced infrequent trading during the estimation period and we discovered that about 20% of target firms and 10% of bidders are affected by thin trading bias. In the relevant literature, there are three models, namely the Scholes & Williams (SW), the Dimson's Aggregate Coefficients (AC) method and the Fowler & Rorke (FR) model which attempt to correct the thin trading bias. Since the betas are biased downwards due to the existence of thin trading the main aim of these models is to increase the average beta of the securities in our sample. On the basis of this criterion we chose the FR model because it gives the highest beta both for bidding and target companies. A description of the models and the procedure adopted in determining the most suitable one is given in Appendix 5.3.

5.4 The Cumulative Average Abnormal Returns (CAARs) of Bidders.

5.4.1 Event Window (-3, +2).

If we look at the table 5.1, examinining the whole sample of 354 bids we can observe that bidders make small negative abnormal returns of -4.9% with the FR model. This is statistically significant at the 1% level both with the dependence and independence assumption[9].

If we split the sample upon the outcome of the bids we can observe from the same table 5.1 that in completed takeovers bidding firms make more losses than in failed takeovers. Bidders of the group Completed1 make a -4.8% which is somewhat lower than that of -4.3% which is reported for bids of the Failed group. However, if we look at the test of difference of their means[10] (groups 1 & 3, table 5.1) it seems that the differences between Completed1 and failed bids are not statistically significant.

The lowest CAARs are observed for the bids in the completed2 category in comparison with the two other groups. They are -10% and statistically significant at the 1% level with both assumptions. This could suggest that the market evaluates more negatively the bidders who failed to acquire their targets compared to those who were subsequently taken over. However, the CAARs of the Completed2 group are not statistically different from the CAARs of the other two groups. Therefore, there is no real difference in the

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[9] Due to the reasons mentioned in section 4.7.1 of the previous chapter it is expected that the independence assumption will underestimate the variance and will give a higher t-value than the dependence assumption. Thus, we consider more reliable the t-statistic given by the cross-dependence assumption of abnormal returns.

[10] This test has been generated by SAS and is based on the assumptions of equal variances. For more details look at the Statistics User's Guide of SAS, pp.795-800, Version 5, 1985.

performance of bidders who abandoned their targets compared to those who succeed.

Table 5.1 Bidders' CAAR's for the months (-3, +2).			
Market Model Adjusted for Thin Trading (FR Model)			
	CAAR	t(d)[11]	t(i)
Whole sample	-0.049	-6.98	-6.97
1.Completed1	-0.048	-5.56	-6.02
2.Completed2	-0.10	-4.58	-3.21
3.Failed	-0.043	-4.87	-3.88
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		0.66	0.50
Groups 1 & 3		-0.17	0.86
Groups 2 & 3		-0.65	0.52

5.4.2 Event window (0).

In the month of the announcement, bidders for the whole sample realise small negative abnormal returns of -1.2% with the FR model (Table 5.2). This is statistically significant at the 10% level with the dependence assumption and at the 1% level with the independence assumption.

If we look at table 5.2 we can see that completed bids appear to give higher negative CAARs than failed ones. Thus, bidders in the Completed1 group make a loss of -1.4% (statistically significant at 10% level) while bidders in

[11] This is the t-statistic with cross dependence assumption of CAAR's and t(i) is with independence assumption. The same applies to all tables which follow.

groups Failed and Completed2 make a loss of -0.9% and -0.3% respectively which are both statistically insignificant with the dependence assumption. However, from table 5.3 we see that the differences among groups 1, 2 & 3 are not statistically significant.

Table 5.2 Bidders' CAAR's for month 0.			
Market Model Adjusted for Thin Trading (FR-Model)			
	CAAR	**t(d)**	**t(i)**
Whole sample	-0.012	-1.75	-2.66
1.Completed1	-0.014	-1.61	-2.78
2.Completed2	-0.003	-0.18	1.09
3.Failed	-0.009	-1.02	-1.61
Test of difference between means for groups 1,2 & 3.			
		t-st.	**Prob.**
Groups 1 & 2		-0.25	0.80
Groups 1 & 3		-0.42	0.67
Groups 2 & 3		0.12	0.90

5.4.3 Event window (+3, +26).

In the third event window (+3, +26) bidders realise large negative CAARs of about -32% with the FR model (table 5.3) which are highly significant. Thus, it seems that mergers are bad investments for the bidding firms when they are examined in the long run. As we can see from table 3 of appendix 5.4, large negative CAARs are generated by all models, although they are much lower with the Market Adjusted Return Model which gives a CAAR of about -12%. It is possible, however, that there is a downwards bias in these returns due to the fact that the size effect is

magnified in this long term observation period.

Furthermore, it can be also seen by looking at table 5.3, that bidders in completed takeovers experience slightly larger losses than bidders in failed takeovers. More specifically the CAARs of bidders in the completed1 group make about 3% lower abnormal returns than bidders in the Failed group. The less negative CAAR's are once again observed for bidders corresponding to targets which were subsequently acquired. However, table 5.3 shows that the differences between Completed1 and Completed2, Completed1 and Failed and Completed2 and Failed are not statistically significant. Thus, we cannot conclude that successful bidders lose more than unsuccessful ones even when we examine them in the long run.

Closing this section, we can conclude that in general, bidders realise on average negative cumulative abnormal retuns which become larger the longer the event window. The above remarks can also be confirmed if we look at the graph[12] 5.1. We can see that the CAARs of bidders are negative from the second month before the bid announcement date and they remain so throughout the whole post-event period.

Another observation that can be made by looking at the graph 5.2 is that bidders in Completed2 category (failed bids which were subsequently completed) give lower returns than the other two groups. However, as we saw from tables 5.1-5.3 this difference is not statistically significant and hence we cannot argue that bidders in completed bids gain less or more than bidders in bids in which the target was subsequently acquired.

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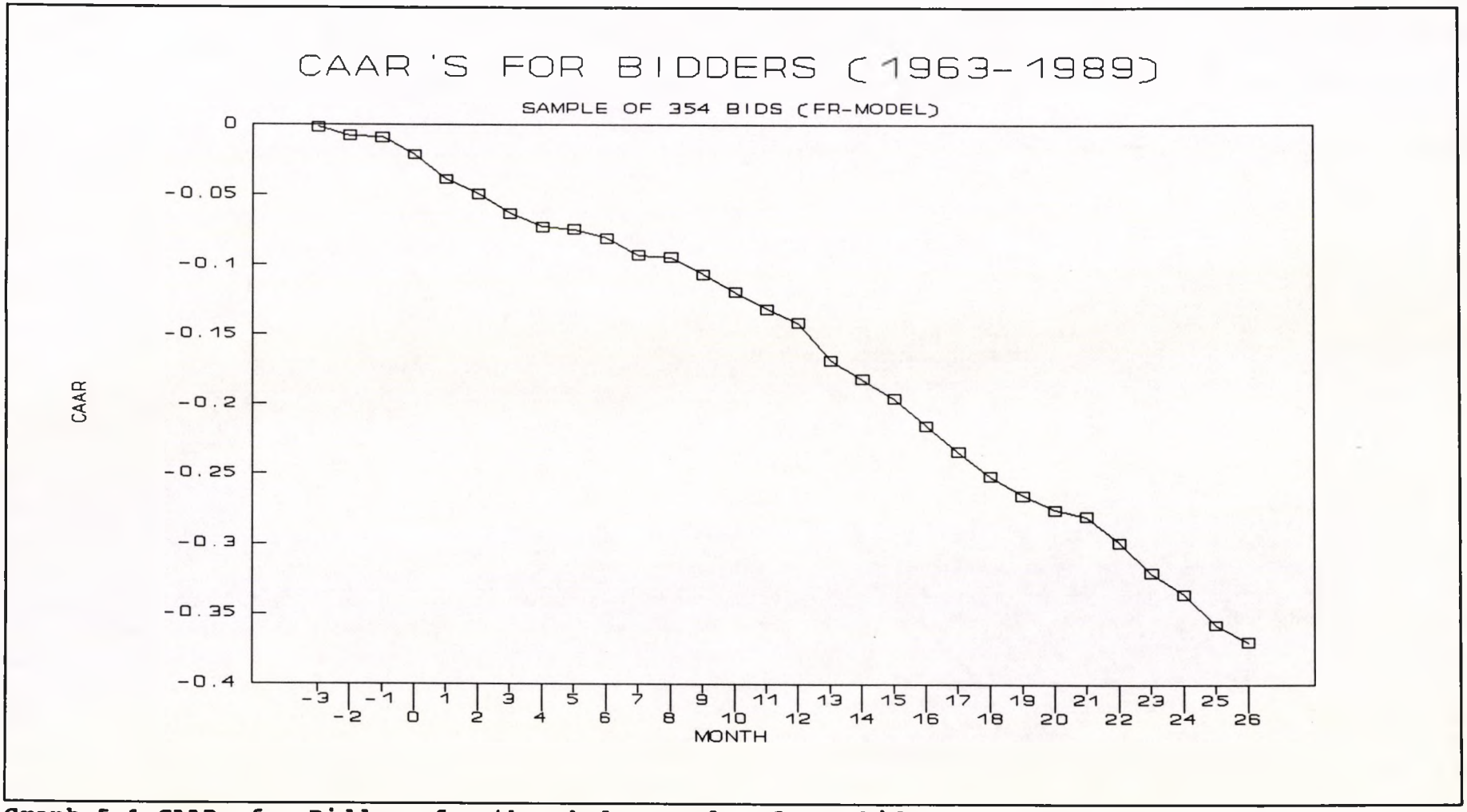
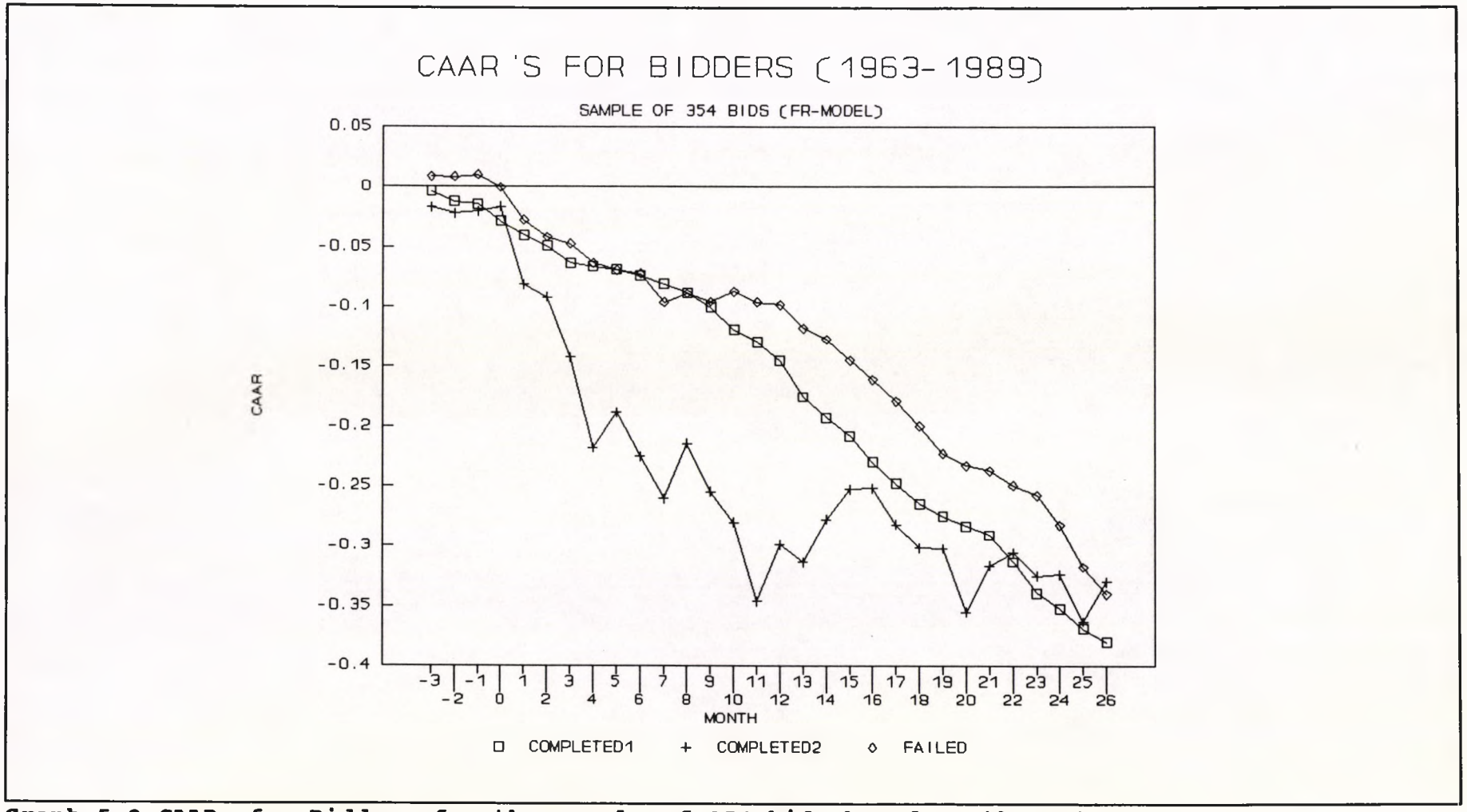
[12] The CAARs estimated by the FR-model have been used for the construction of graphs.

Table 5.3 Bidders' CAAR's for the months (3, +26).			
Market Model Adjusted for Thin Trading (FR Model)			
	CAAR	**t(d)**	**t(i)**
Whole sample	-0.32	-45.34	-61.03
1.Completed1	-0.332	-38.33	-50.01
2.Completed2	-0.173	-7.88	- 6.59
3.Failed	-0.306	-34.63	-33.61
Test of difference between means for groups 1,2 & 3.			
		t-st.	**Prob.**
Groups 1 & 2		-0.76	0.44
Groups 1 & 3		-0.38	0.70
Groups 2 & 3		0.66	0.50

As we can see from the graph 5.2, a clear trend of bidders in the Failed1 group outperforming the bidders in the Completed1 group emerges only after the ninth month after month 0. Therefore, it is more difficult to make a comparison between bidders in the Completed1 and Failed categories and this maybe one of the reasons why the difference between the group means of Completed1 and Failed2 proved to be statistically insignificant.



Graph 5.1 CAARs for Bidders for the whole sample of 354 bids.



Graph 5.2 CAARs for Bidders for the sample of 354 bids based on the outcome.

5.5 The Cumulative Average Abnormal Returns (CAAR's) of Targets.

5.5.1 Event window (-3, +2).

Targets in the first event window obtain large positive gains which are about 29.4% with the FR-Model (Table 5.4) and highly statistically significant at the 1% level.

It is also obvious that target companies make higher abnormal returns in completed (Completed1) than failed (Failed) takeover bids. Targets in completed takeovers (Completed1) gain a CAAR of 31.3% which is about 3% higher than in failed ones. However, as we can see from table 5.4 the differences of the CAARs between Completed1 and Failed groups are not statistically significant.

Targets which were subsequently acquired (Completed2) in the (-3, +2) period earn about 10-12% lower CAARs than the other categories. However, the CAARs of Completed2 category targets are not significantly different from the CAARs of Completed1 category as the test of differences of the means suggests. On the other hand, if we look at the table 4 of appendix 5.4, the differences of the means of the groups 1 & 2 become statistically significant with the Market Model and the Mean Adjusted Return models. With respect to the differences between Completed2 and Failed categories they are statistically significant only with the Mean Adjusted Return model.

Thus, there is a divergence at this point in the results obtained between the FR model and the other models. However, since we rely on the FR model we can conclude that the differences between completed and failed bids are not statistically significant and consequently we cannot argue that target shareholders are better off in completed takeovers than failed ones. What is clear however, is that target shareholders make substantial gains irrespective of the bid outcome.

Table 5.4 Targets' CAAR's for the months (-3, +2).			
Market Model Adjusted for Thin Trading (FR Model)			
	CAAR	**t(d)**	**t(i)**
Whole sample	0.294	44.12	73.02
Completed1	0.313	43.70	57.83
Completed2	0.188	4.97	8.27
Failed	0.282	24.27	30.05
Test of difference between means for groups 1,2 & 3.			
		t-st.	**Prob.**
Groups 1 & 2		1.35	0.17
Groups 1 & 3		0.55	0.57
Groups 2 & 3		-1.10	0.27

5.5.2 Event window (0).

On the announcement month 0 targets' shareholders reap substantial gains which are about 22.8% (table 5.5) and highly statistically significant. As we see, the CAARs are about 7% lower than the CAARs in the previous event window which shows that abnormal gains are also made in the pre-announcement and post-announcement period.

Failed bids give about 2% higher returns than completed bids on the month of the announcement but this difference is not statistically significant. Although, it seems that targets in bids first failed but subsequently taken over (Completed2) experience the lowest returns from the two other groups, this difference is statistically insignificant.

Table 5.5 Targets' CAAR's for month 0.			
Market Model Adjusted for Thin Trading (FR Model)			
	CAAR	**t(d)**	**t(i)**
Whole sample	0.228	34.31	53.72
1.Completed1	0.222	31.04	40.24
2.Completed2	0.217	5.75	9.50
3.Failed	0.249	21.39	27.79
Test of difference between means for groups 1,2 & 3.			
		t-st.	**Prob.**
Groups 1 & 2		0.08	0.93
Groups 1 & 3		-1.03	0.30
Groups 2 & 3		-0.58	0.56

5.5.3 Event window (+3, +26).

Looking at table 5.6, we can observe that targets as a whole in the post-outcome period gain a CAAR of about 5.7% which is statistically significant. Thus, target companies which survive the first bid subsequently retain[13] a part of the bid premium. We can see from table 5.6 that target companies which were not taken over lose the largest part of the bid gains. With the Market Adjusted Return model they even make negative returns (Appendix 5.4, table 6). Thus, targets who remained independent in the period of 2 years after the outcome date make only 4.4%, while targets which were acquired following another bid gained about 34.8%. However, this difference is not statistically significant as we can see from the test of difference between means of groups 2 &

[13] From the sample of targets we have removed these companies which were acquired in the previous period (-3, +2).

3 (table 5.6).

Table 5.6 Targets' CAAR's for the months (3, +26).			
Market Model Adjusted for Thin Trading (FR Model)			
	CAAR	t(d)	t(i)
Whole sample	0.057	8.69	8.96
1.Completed1			
2.Completed2	0.348	9.19	3.40
3.Failed	0.044	3.86	6.39
Test of difference between means for groups 2 & 3.			
		t-st.	Prob.
Groups 2 & 3		0.35	0.74

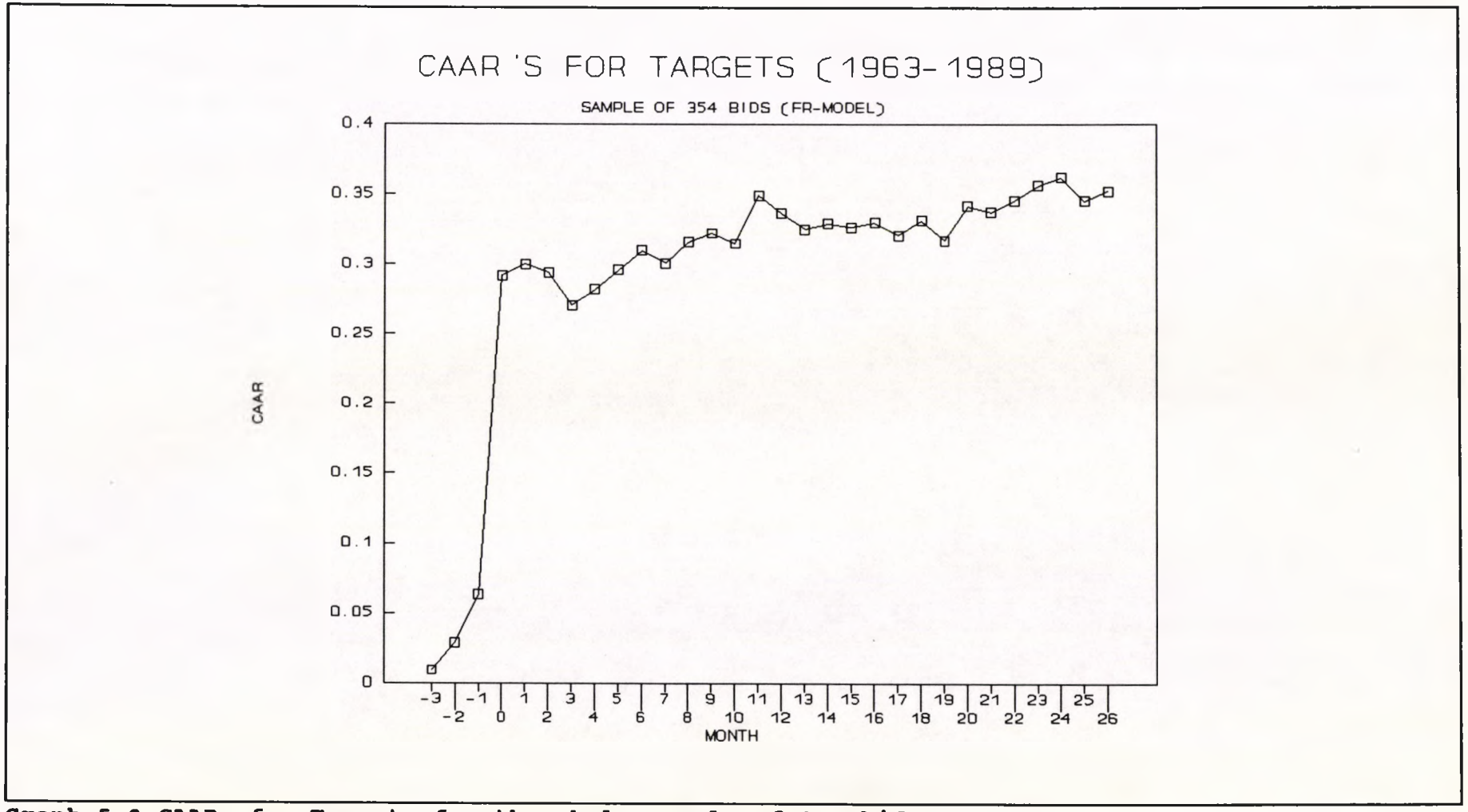
If at this point we look at graphs 5.3 and 5.4 we can confirm what we reported for the three event windows examined above. Thus, looking at the graph 5.3 we can see that target companies capture substantial positive excess returns over the whole observation period (-3, +26). Furthermore, this result is consistently given by all models applied in tables 4-6 of Appendix 5.4.

Looking at the same graph we can observe that the market started to anticipate the bids 3 months before the announcement date and that the upwards adjustment to targets share prices continued upwards until the first month after the announcement date. From the second month and until the third month after the bid the share prices of the target companies fell. However, from the fourth month (+4) and until the 26th month after the bid there is a trend for an upwards revaluation of the share prices of the target companies.

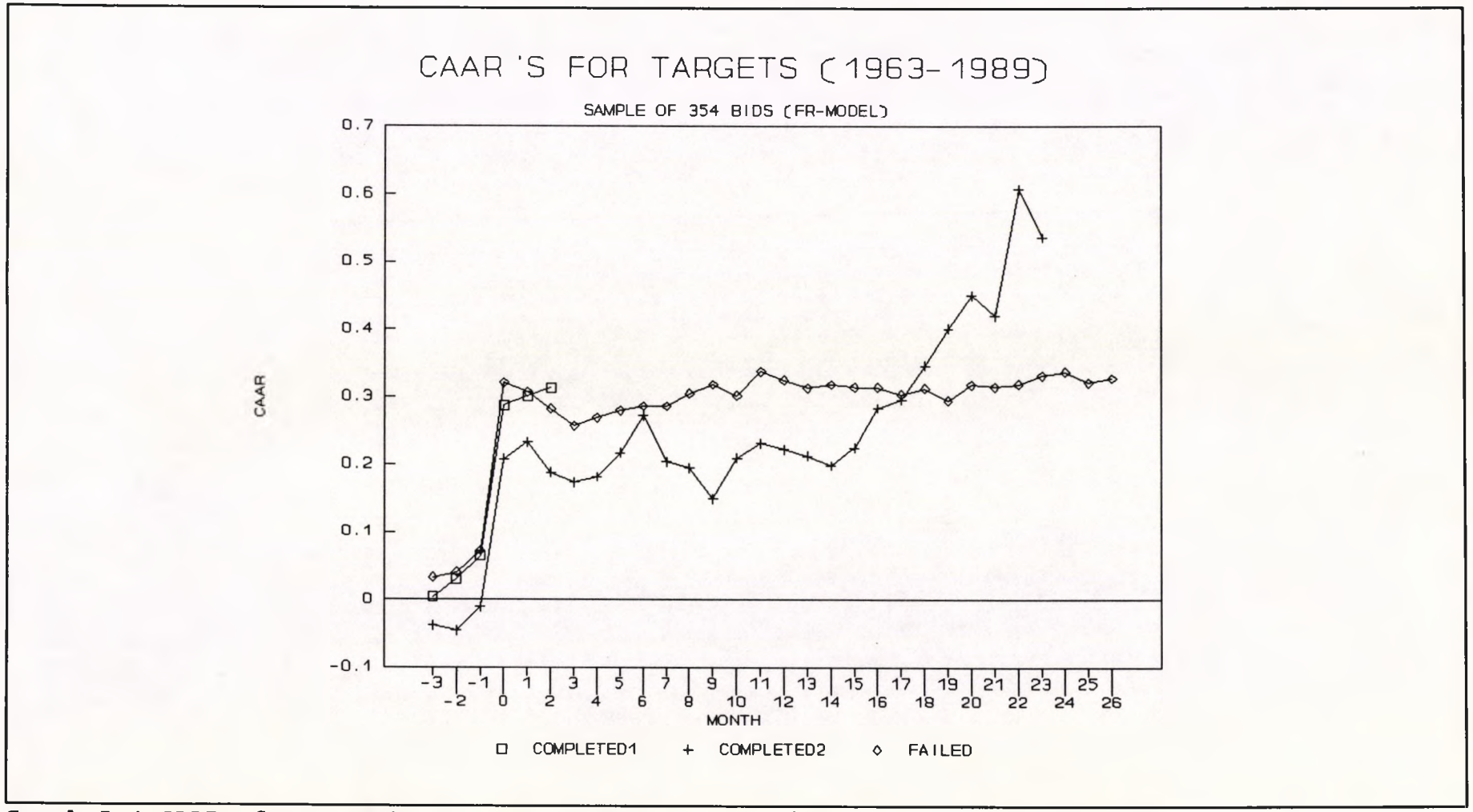
Looking at the graph 5.4 we can observe that completed bids in the (+3, +26) period (Completed2 group) tend to give higher returns than failed bids only after the 17th month. From the 18th month and until the 22nd month the CAARs rise

steadily up to 60%. This is probably due to the impact of new bids which eventually led to the acquisition of these target firms. On the other hand targets who remained independent in the 2 year post-bid period although they retain a large part of the abnormal gains made in the announcement month they realise lower returns than the previous group due to the absence of further bids. This suggests that the source of gains may have been both the release of new information and the expected synergies.

However, this trend in the difference between completed (Completed1) and failed bids did not prove to be statistically significant. Only the Market Model and the Mean Adjusted Return Model (appendix 5.4, table 4) show that bids completed in the period (-3, +2) give significantly higher returns than bids subsequently acquired (Completed2). This can be explained by the fact that the CAARs of Completed2 group are higher than the CAARs of Failed group only after the 17th month and in general a rather erratic pattern is exhibited in the CAARs of Completed2 group in contrast to a relatively stable pattern of Failed group. As we can observe from graph 5.4, the CAARs of Completed2 group show a few peaks on months (+1), (+6), (+11), (+20) and (+22) and a few troughs on months (+3), (+9), (+14) and (+21). This may explain why the large difference of about 30% between the abnormal returns captured by targets in the Completed 2 group and Failed group is not statistically significant (table 5.6).



Graph 5.3 CAARs for Targets for the whole sample of 354 bids.



Graph 5.4 CAARs for Targets for the sample of 354 bids based on the outcome.

5.6 The Cumulative Average Abnormal Returns (CAARs) of the Combined Firms.

We have estimated the total returns[14] for the whole observation period and all 3 event windows. However, we decided to report the Total CAARs only for 2 event windows, the (-3, +2) and (0), because the impact of total gain in the case of completed mergers during the post-bid period is fully reflected in the successful bidders returns in the period (+3, +26). We do not estimate the total returns in the case of failed mergers in the post-bid period since the firms do not merge and synergies are not created.

5.6.1 Event window (-3, +2).

By looking at the total CAARs of the completed bids of our sample (table 5.7) we can observe a positive overall performance. The FR model gives a positive abnormal return of 1% which is statistically significant at the 1% level using both the dependence and the independence assumptions. This shows that there is a small increase of the total value of the combined firm.

However, the trend between completed and failed bids is less clear cut in the case of the combined returns. Thus, according to the FR model failed bids give higher total returns for the combined firm than completed bids (table 5.7). Table 5.7 shows that the difference between the means of the Completed1 and Failed groups is not statistically significant.

The lowest returns are observed for the group Completed2,

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[14] As mentioned at the beginning of this chapter the Total CAARs have been calculated only for the period 1979-1989 for which we have the available data of market values of the companies in our sample. As a result of that the sample is now reduced to 253 bids. Thus, the combined firms CAARs are estimated for a different sample than the one used in the previous sections 5.4 and 5.5.

i.e. the bids which failed but subsequently were completed, which give a negative CAAR of -13.1%. This is the result of the very low returns of bidding companies (table 5.1) observed for the Completed2 group and since these companies have a high market value a larger weight is assigned to them than for target firms reducing the total returns. The same explanation applies to the low level of Total CAARs in all categories.

As we can see from table 5.7, the difference between Completed1 and Completed2 is statistically significant (at the 10% level) showing that companies make more gains when bids are completed in the first place than in the case that the bids are completed in the post-outcome (+3, +26) period. Also, companies in the failed but subsequently completed group (Completed2) experience lower returns than failed bids and this is again statistically significant at the 10% level.

5.6.2 Event window (0).

The CAARs for the combined firms for the whole sample on the announcement month are positive and higher than the previous event window giving a 3.6% total return which is statistically significant (table 5.7).

The total CAARs in completed bids are 3.7% with the FR model suggesting a positive overall impact of takeover bids for this month. These returns are slightly higher than the 3.4% returns for failed bids. However, as we can also see from table 5.7 the differences between the means of CAAR's of Completed1 and Failed bids are not statistically significant. The highest CAAR's of 3.8% (statistically significant at the 10% level with the dependence assumption) are generated for the companies in the Completed2 group and this contradicts our findings for the previous event window which exhibited negative returns for companies in this category.

However, the differences between Completed2 and Completed1 and Completed2 and Failed are not statistically significant.

Table 5.7 Total returns for the sample 1979-1989.			
Market Model Adjusted for Thin Trading (FR Model)			
	For the (-3, +2) months		
	CAAR	t(d)	t(i)
Whole sample	0.010	2.02	6.18
1.Completed1	0.018	3.00	6.09
2.Completed2	-0.131	-5.19	-3.33
3.Failed	0.031	2.97	3.74
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		1.72	0.10
Groups 1 & 3		-0.40	0.68
Groups 2 & 3		-1.82	0.09
	For month 0		
	CAAR	t(d)	t(i)
Whole sample	0.036	6.83	9.01
1.Completed1	0.037	6.08	7.18
2.Completed2	0.038	1.51	3.49
3.Failed	0.034	3.24	4.48
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		-0.05	0.95
Groups 1 & 3		0.19	0.84
Groups 2 & 3		0.11	0.90

5.7 Discussion of our results in comparison with the findings of other studies.

In this section we attempt to highlight and compare the main results of our study with the results of some previous UK and US studies. Table 5.8 was constructed to summarise the findings of the main previous studies.

The main findings of our empirical research can be summarised as follows. First, bidding firms experience small negative abnormal returns in the announcement and post-announcement period until the outcome date. However, if we look at a 2 year post-bid period then the negative returns are very high. In general, our results for bidders are in accordance with the majority of the UK studies. In fact, they lie somewhere between those reported by **Firth (1980)** and **Limack (1991a)**. For example, Firth reported a -7.7% CAAR for successful bidders [with the market model for a similar event window (-4, +1)] and Limmack found a CAAR of -0.2% while we reported a 4.9% with the FR-model.

However, our findings regarding the post-event performance of bidding companies for completed takeovers are in conflict with the UK study of **Franks & Harris (1989)** who showed a -12.6% CAAR for bidders in completed takeovers (with the market model) in the period of 24 months after the outcome which is different from our estimate of -32% (with the FR-model). From the US studies only the **Magenheim & Mueller (1988)** study gives similar results to ours. Magenheim & Mueller discovered a -23.94% CAAR for bidding firms in completed takeovers in a 2 year post-bid period which is close to our estimate of -32% in the (+3, +26) period. Furthermore, our results are different from those reported by the US study of **Franks, Harris & Titman (1991)**. After controlling for the size effect they reported that acquiring firms obtain a -0.11% for the period of 36 months after the bid.

Second, target companies make large positive gains in the three event windows examined. The empirical evidence both in US and UK appears to give similar results to ours. For example, our figure of 31.3% with the FR model for successful targets in the (-3, +2) period for the 1963-1989 sample is very close to that of 29.09% reported by **Jensen & Ruback (1983)**, somewhat lower than Limmack's estimate of 37.15% and close to the 28.5% reported by **Sudarsanam et.al. (1993)**.

Third, the total gain for the merged firms appears to be slightly positive in the announcement period and the post-announcement period until the outcome date and this is in agreement with the findings of the other studies, although it differs regarding its magnitude. Thus, we discovered a total CAAR of 1.8% with the FR-model for completed takeovers which is lower than the 5.8% figure reported by **Limack (1991a)** and the 4.7% reported by **Sudarsanam et.al. (1993)**, both estimated with the market model adjusted for thin trading for a similar event window (-3, +2).

Fourth, it seems that for all event windows examined, slightly higher returns are generated for bidders in failed bids than completed bids. On the other hand target companies obtain higher returns in completed than failed bids in all event windows except the announcement month (0). The fact that abandoned bids tend to give higher CAAR's for targets on the announcement month has also been reported in other studies such as **Firth (1980)** and **Jensen & Ruback (1983)** (table 5.8). A possible explanation for this could be that the majority of failed bids are more likely to be hostile bids in which the target's management by resisting the bid can obtain higher gains on the announcement month which subsequently decline when the takeover fails to materialise. On the other hand, the majority of completed bids are likely to be friendly bids.

However, the above differences are not statistically

significant in all event windows examined according to the test of differences of the means for the above groups. This result resembles the findings of **Limack (1991b)** who also reported that differences of the CAARs obtained in completed bids are not statistically significant from those obtained in failed ones and this applies to both bidders and targets. Unfortunately, no other study that we are aware of, (except Limmack's) used the same test of differences of the group means.

The fact that completed bids in the period (+3, +26) do not give statistically significant higher returns of target companies than failed bids during the same period and failed bids still give high abnormal returns during the same period (graph 5.4) suggests the possibility that one of the source of gains may be the information asymmetries hypothesis in which the release of new information about the value of the target company leads to a permanent upwards revaluation of its shares. This finding however, is in conflict with the findings of **Bradley, et.al. (1983)** which supported the argument of expected synergies.

Comparing the performance of bidders who failed to acquire their targets which subsequently were taken over (Completed2 group) with those bidders of which their targets survived for a period of 2 years after the bid (Failed) and those bidders who succeeded to acquire their targets in the first place (Completed1) is not easy since our results do not offer a clear and stable pattern across the 3 event windows. For example, in the long event window (+3, +26) bidders of the Completed2 group experience less losses than those of the Completed1 or Failed groups, while in the (-3, +2) the opposite occurs. A similar problem also arises examining the case of target companies. However, what is clear is that the differences of the means between the two groups of bids are not statistically significant.

However, this applies only to bidding and target firms because if we examine the case of combined firm returns (table 5.7) it emerges that we have statistically significant differences between the Completed2 and the Failed groups and between the Completed1 and the Completed2 groups. As mentioned in the previous section 5.6, the bids of the Completed2 category give statistically significant lower total returns than those which were not completed in the post-event period (Failed group). Also, the total returns are significantly higher in the group of completed1 bids than bids which first failed and then were subsequently completed. The latter difference suggests that the market considers in a negative way the fact that the takeover was completed by a different combination of bidder and target than the initial one. This may indicate that the market anticipated the realisation of some kind of "unique synergies" which failed to arise after the bid abandonment. It is equally possible that the market perceived the bid abandonment as a sign of bidder's weakness and a strengthening of the market position of a competitor.

Table 5.8 A list of the findings of the main and more recent UK and US event studies regarding takeover gains.

Panel A. UK studies

Study	Methodology	Data & Estm.period	Results (CAAR's)
Firth (1980)	Market model	Monthly data. Estimation period (-48,13).	Successful bidders in the (-4, +1) period make -7.7% CAAR's and unsuccessful bidders -7.6%, while targets gain 37.5% in completed bids and 44.7% in abandoned ones. For the month 0 targets gain 28% in successful bids and 31.2% in unsuccessful ones whereas bidders lose -6.3% and -6.0% accordingly.
Franks & Harris (1989)	3 models used (market model, market index and CAPM). Results reported are based on the market index model.	Monthly data. Estimation period of 60 months.	For month 0 bidders gain 1.0% (significant at 10% level) and targets 23.3%. In the period (-4,+1) bidders gain 2.4% and targets 25.8% (on a value weighted basis). In the period of 24 months after the outcome date acquiring firms obtained 4.8% with the market index model, 4.5% with the CAPM but suffered -12.6% losses with the market model.

Limack (1991a)	3 models used (market model, model adjusted for thin trading and market index model). Results reported use the model adjusted for thin trading).	Monthly data. Estimation period (-67,-7).	Successful bidders in the period (0,+2) realise -0.2% and unsuccessful bidders experience -6.02% CAAR's. Successful targets in the period (-3,+2) make 37.15% gains and unsuccessful targets 27.23%. The total return is 5.84%. In the (0,+24) period bidders in completed bids make 0.15% and in abandoned bids make -1.28% while targets make gains of 30% in abandoned bids. In the post-outcome period of 24 months bidders lose -4.47% in completed bids and -20.23% in failed bids, while targets in failed bids make 2.68% gains.
Limack (1991b)	The same models used in the previous study.	The same as above.	In the post-outcome period bidders which failed to acquired their targets which remained independent for 5 years after the first bid suffered smaller losses (-19.32%) in the period (+1,+24) than the group of bidders whose targets had been subsequently acquired (-23%) in the 5 years after the bid. However, targets which had been acquired within 5 years made losses of (-7.47%) in contrast with targets which had remained independent during 5 years and made 4.61% gains in the (+1,+24) period. However, these differences were not statistically significant.

Sudarsanam, Holl & Salami (1993)	3 models used. Raw returns, Dimson's and market index model.	Daily data. Estimation period (-220, -41).	In the period (-40,+40), bidders suffer -3.71% losses with the Dimson's model (DM), but with the market index model (MIM) make close to zero gains (0.66%), while targets make 28.5% and 24.97% gains respectively. This generates a combined return 4.74% (DM) and 7.01% (MIM). Finally, for the 0 month (represented by the event window of -10,+10 days in this study) bidders lose -5.09% (DM) and -3.63% (MIM), targets gain 22.12% (DM) and 18.6% (MIM). Thus, the combined returns are 1.49% (DM) and 2.32% (MIM).
Wong, Dobson, Wright & Thompson (1993)	3 models used. The market adjusted return model, the market model and the market model adjusted for thin trading using London Business School estimates of betas (results reported with this model).	Monthly data. A 48 months estimation period was used. Only abandoned bids were examined.	In month 0 bidders make -3% losses and statistically significant and targets make only 12% gains and thus they generate a combined return of 2% (and not significant). In the post-abandonment period (+1, +24) bidders made losses of -41%, targets suffered -39% negative gains and this resulted in a figure of CAAR equal to -44% for the combined firm.
Panel B. US studies.			

Jensen & Ruback (1983)	Weighted average of the CAAR's of 13 US studies.	Daily and monthly data.	For mergers in the announcement period bidders in completed bids gain 1.37% and in failed bids 2.45%, while targets gain 16% and 17.24% respectively. In tender offers bidders gain 3.81% in completed bids but lose -1.11 in failed ones whereas targets gain 29.09% and 35.17% accordingly.
Bradley, Desai & Kim (1983)	Market model.	Monthly data. Estimation period of 60 months (-72,-13).	Targets which were subsequently taken over after the bid abandonment obtained 46.30% in the (-1, +1) period, whereas for the same period targets which remained independent (in the 2 years post-bid period) gained 20.16%. In the post-abandonment period (+1, +24) targets in the first group gained 17.35% while targets remaining independent suffered -27.47% CAAR's.
Magenheim & Mueller (1988)	Market model.	Monthly data. Estimation period (-60, -4) and (-36, -4). Completed mergers only.	Acquiring firms make negative CAAR's of (-9.46%) for the (-3,+6) period, (-23.94%) for the (-3,+24) period and (-0.28%) on the month 0. These results are based on the estimation period (-36,-4).
Franks, Harris & Titman (1991)	Multi-factor portfolio benchmark controlling for size effect.	Monthly data. Estimation period (-240, -41).	In the period of 36 months after the outcome date acquiring firms made -0.11% CAAR's.

5.8 Summary and Conclusions

The main objectives of this chapter were to answer the question whether or not mergers increase shareholder returns, to examine if there are any differences in the wealth effects between completed and failed takeover bids and to investigate the potential source of gains. In the light of the discussion made in the previous section we can summarise our final conclusions as follows.

The **first** is that hypothesis H1 set in section 5.2 was supported at least in the case of the target and combined firms returns. In other words, our evidence suggests that bidding firms make on average small negative abnormal returns and target firms make large gains. The above generate a small overall positive gain for the merged firms. Therefore, it seems that mergers constitute a profit related activity when examined in the short run, and that one of the motives driving managers to engage in takeover activity is the maximisation of shareholder wealth. However, for the bidding firms shareholders it seems that on average takeover bids were not a good experience since they realised small losses. This finding also gives some support for the managerial theories and suggests the existence of the agency problem.

Furthermore, the positive impact of mergers is conditional on the length of the observation period. If we expand the observation period for two years after the bid the bidders and consequently the combined firms suffer large losses. There are two possible reasons for this. One is that in the long run the market considers mergers to be bad investments which reduce the shareholder wealth. Another explanation is the inability of the existing pricing models to estimate correctly the abnormal returns due to the possible shifts of alphas and betas and the size effect anomaly which are likely to take place when a long event window is examined. As mentioned in section 5.3.3, if the size effect exists,

and it is likely to exist to a certain extent for bidders, we should expect that the CAARs of bidders in the (+3, +26) will be biased downwards. Moreover, if bidders have timed mergers with an unusually high pre-bid performance which is reflected in the alpha term of the market model this would result in high negative abnormal returns. In this case the negative returns cannot be attributed to the takeover bid.

However, the fact that bidders abnormal returns are already negative or at least close to zero during a short event window in which the size effect and other estimation biases are kept to a minimum, strongly supports the argument that bidders do not gain in takeover bids. This further suggests that the gains for the merged firm stem from the increase in the market value of the target firm rather than the bidding firm.

The **second conclusion** is that completed bids do not give statistically significant higher returns (both for bidders and targets) than failed bids. This conclusion forces us to reject the three hypotheses (H2-H4) set in section 5.2.1. Thus, we cannot accept the proposition that expected synergies is the source of gains. We consider it more likely that it is the release of new information about the target companies that leads to an upwards revaluation of their shares and their subsequent gains.

Nevertheless, there is some evidence that in the case of combined firms, bids which first failed in the (-3, +2) period and then were subsequently completed by another bidder (Completed2 group) give significantly lower returns than bids completed within 2 months after the announcement month (Completed1 group). This may occur either due to the loss of potential "unique synergies" arising from a specific combination of bidder's and target's assets or due to a signal of bidder's weakness based on the fact that the target firm falls in a competitor's hands. However, this

applies only in the case of the (-3, +2) event window. When we look at the performance of bidders in the post-outcome period the differences between failed bids and the two groups of completed bids become statistically insignificant.

Finally, it is also plausible that, as **Limack (1991b)** argued, there may be more than one source of gains including among other things the release of new information and expected unique synergies. However, the identification of the source of gains from takeovers will be examined more thoroughly in the chapter which follows.

APPENDICES

Appendix 5.1 The estimation of Total Cumulative Average Abnormal Returns (Total CAAR's).

The total impact of takeover bids on the combined firm is measured by Total CAAR which is the percentage gain which arises from the value weighting of the bidder's CAAR and the target's CAAR. The weighting is based on the market values of the bidder and target at the end of the fourth month before the bid. The market value of the target companies has been adjusted to exclude the bidder's toehold (the percentage of target's shares already owned by the bidder before the bid). The Total CAAR's were calculated for both completed and failed bids. Due to unavailability of the market values of the majority of companies before 1979, our initial sample of 354 bids (period 1963-1989) was reduced to 253 (period 1979-1989). The formula which is given below was used for each of the four different models employed in our analysis.

$$TOTCAAR = BCAAR * \left(\frac{MV_B}{MV_B + MV_T}\right) + TCAAR * \left(\frac{MV_T}{MV_B + MV_T}\right) \quad (5.1)$$

where : TOTCAAR is the Total CAAR
BCAAR is the bidder's CAAR
TCAAR is the target's CAAR
MV_B is the market value of the bidder
MV_T is the market value of the target company adjusted for the bidder's toehold.

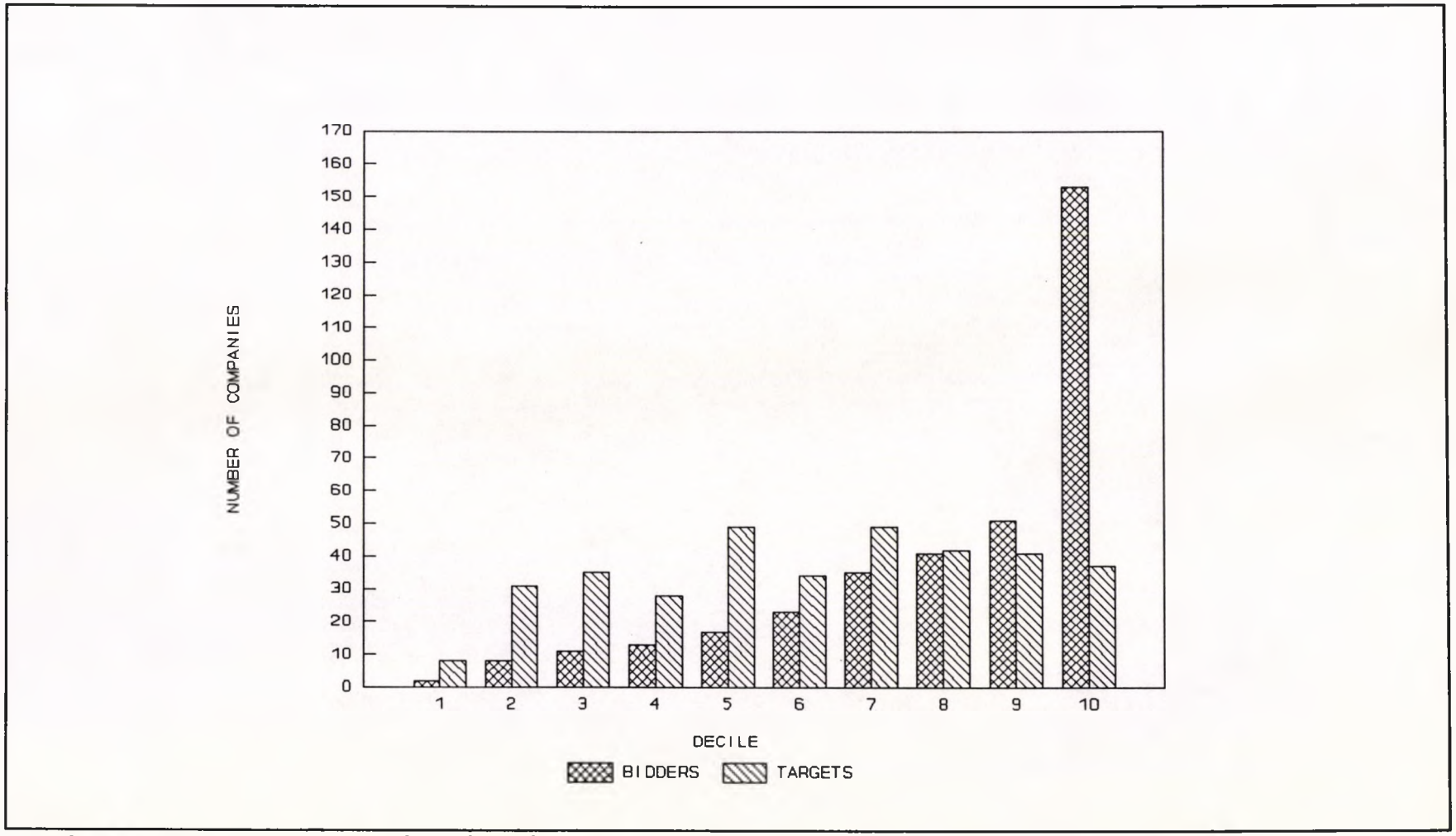
Appendix 5.2 The frequency distribution of market values of the companies in our samples.

As mentioned in section 5.3.3 of this chapter, we decided to examine the size of the bidding and target companies in our sample. Using the criterion of market capitalisation (the market value of the companies at the beginning of each year) we classified the companies into deciles which are adjusted in each year during the period 1963-1989.

Table 5.9 The frequency distribution of market values of bidders and targets.

	BIDDERS	TARGETS
Decile	No. of Firms	No. of Firms
1	2	8
2	8	31
3	11	35
4	13	28
5	17	49
6	23	34
7	35	49
8	41	42
9	51	41
10	153	37
Total	354	354

From the above table and the graph which follows we can see that the size distributions are fairly symmetric (especially for the target companies). However, 43% of the bidder companies are concentrated in the highest decile and this may cause a downwards bias for bidding firms. The number of companies which belong in the lowest deciles is very small in both distributions, whereas in targets' distribution the majority of companies is contained in between deciles 5 and 9.



Graph 5.5 The frequency distribution of market values of bidders and targets.

Appendix 5.3 Thin trading adjustment

The main problem of thinly traded securities is that the betas generated by the market model are biased downwards. The average beta obtained with the market model is 0.97 and 0.79 for bidding and target companies respectively. Securities which usually suffer from this phenomenon are those of smaller size companies and this is particularly so for target companies. Therefore, it is necessary to adjust for this bias adopting the following procedure.

We begin by identifying those companies which are characterised by infrequent trading. LSPD gives a trading marker for each security which shows the number of days which have passed since the last transaction was made. Also, the fact that if the return obtained from LSPD had a zero value indicates that the security was not traded. We observed that about 10% of bidding companies and 20% of target firms of our sample fall in the category of securities thinly traded. The next step was to correct for this problem by increasing the average beta of those securities both for targets and bidders. There are three models which aim to increase the average beta and these are the **Scholes & Williams (1977)** model, the **Dimson's Aggregate Coefficients (1979)** model and finally the **Fowler & Rorke's (1983)** model. From these we shall chose the one which gives the highest beta.

1. Scholes & Williams.

We run three regressions of the return of each security R_{jt} against the return on the market index R_{mt}. The first regression uses one lagged term of the R_{mt}, the second its current term and the third regression one leading term. We sum up the betas from this regressions and we divide by the second order autocorrelation coefficient plus one. The formula is :

$$\beta_i = \frac{(\beta_i^- + \beta_i^0 + \beta_i^+)}{(1 + 2\rho_{m1})} \qquad (5.2)$$

Using the the FT-All Share Index[15], we obtained an average beta for all the bidding companies equal to 1.31, while for all target it was equal to 1.06.

2. Dimson's Aggregated Coefficients Method.

This method attempts to maximize beta by taking different combinations of lags and leads of the market index (including the current term). We run 36 regressions of each security return against the market index, by using 36 combinations of 5 lags and 5 leads. The sum of betas can be expressed as :

$$\beta_i = \sum_{k=-5}^{+5} \beta_{ik} \qquad (5.3)$$

Thus, using FT-ALL Share Index the highest beta of 1.29 for bidders is obtained by a combination of 5 lags and 2 leads and for targets the value is 1.007 using the same combination.

3. Fowler & Rorke model (FR-Model).

Fowler & Rorke argued that the Dimson's model was misspecified, but they also corrected the model of Scholes & Williams by adding another lead and lag and adding in the denominator of (5.2) the first order autocorrelation coefficient adjusting for serial correlation. Thus, the formula (5.2) is transformed to :

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[15] We followed the same procedure for the other two indices, namely the HGSC Index and the EW Index.

$$\beta_i = \frac{(\beta_i^{-2} + \beta_i^{-1} + \beta_i^{0} + \beta_i^{+1} + \beta_i^{+2})}{(1+2(p_{m1}+p_{m2}))} \qquad (5.4)$$

Using FT-ALL Share Index we obtain an average beta of 1.67 for bidders and 1.28 for targets which is the highest one compared with the other two models. Based on the criterion of chosing the model which gives the highest average beta, we select the Fowler & Rorke model (both for bidders and targets) which gives an average bidder's beta of 1.67 and an average target's beta of 1.28.

Appendix 5.4 Tables.

Table 5.4.1 Bidders' CAAR's for the months (-3, +2).									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	-0.037	-6.06	-6.78	0.011	1.68	3.91	-0.018	-2.87	-1.59
1.Completed1	-0.029	-4.01	-5.12	0.019	2.47	3.66	-0.005	-0.69	-0.37
2.Completed2	-0.121	-5.41	-3.68	-0.068	-3.05	-1.05	-0.185	-6.69	-5.61
3.Failed	-0.045	-5.22	-4.10	0.002	0.29	0.55	-0.028	-2.42	-2.05
Test of difference between means for groups 1,2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 1 & 2		1.15	0.26		1.19	0.24		2.00	0.06
Groups 1 & 3		0.56	0.57		1.78	0.43		0.70	0.48
Groups 2 & 3		-0.93	0.36		-0.96	0.35		-1.69	0.10

Table 5.4.2 Bidders' CAAR's for month 0.									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	-0.011	-1.77	-2.45	-0.002	-0.27	-0.61	-0.0068	-1.03	-1.24
1.Completed1	-0.011	-1.56	-2.55	-0.002	-0.34	-0.93	-0.007	-0.96	-1.34
2.Completed2	-0.003	-0.13	1.17	0.004	0.20	1.24	0.009	0.32	1.29
3.Failed	-0.01	-1.26	-1.77	-0.0004	-0.04	-0.82	-0.009	-0.78	-1.33
Test of difference between means for groups 1,2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 1 & 2		-0.23	0.82		-0.22	0.82		-0.44	0.66
Groups 1 & 3		-0.05	0.95		-0.19	0.84		0.16	0.87
Groups 2 & 3		0.20	0.83		0.15	0.88		0.48	0.63

Table 5.4.3 Bidders' CAAR's for the months (3, +26).									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	-0.305	-48.99	-61.04	-0.123	-18.74	-21.59	-0.368	-56.00	-64.16
1.Completed1	-0.31	-41.79	-49.96	-0.128	-16.56	-17.42	-0.394	-54.34	-54.06
2.Completed2	-0.181	-8.09	-6.31	-0.017	-0.78	-0.34	-0.369	-13.37	-9.64
3.Failed	-0.305	-35.35	-33.58	-0.125	-14.19	-13.83	-0.289	-24.79	-25.55
Test of difference between means for groups 1,2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 1 & 2		-0.69	0.48		-0.68	0.49		-0.25	0.79
Groups 1 & 3		-0.13	0.89		-0.10	0.91		-1.10	0.26
Groups 2 & 3		0.64	0.51		0.60	0.54		-0.25	0.79

Table 5.4.4 Targets' CAAR's for the months (-3, +2).									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	0.313	49.80	77.37	0.294	45.49	69.42	0.320	43.76	68.58
1.Completed1	0.334	51.64	61.84	0.314	47.64	55.27	0.345	44.83	55.34
2.Completed2	0.189	5.01	8.56	0.224	5.80	9.69	0.121	3.01	4.29
3.Failed	0.298	27.51	32.22	0.274	22.56	27.70	0.311	23.41	28.68
Test of difference between means for groups 1,2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 1 & 2		1.67	0.09		1.09	0.27		2.52	0.01
Groups 1 & 3		0.66	0.50		0.87	0.38		0.52	0.59
Groups 2 & 3		-1.26	0.20		-0.65	0.51		-2.13	0.03

Table 5.4.5 Targets' CAAR's for month 0.									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	0.232	36.91	55.60	0.231	35.80	52.67	0.235	32.15	48.22
1.Completed1	0.227	35.06	42.36	0.226	34.31	39.93	0.230	29.87	37.06
2.Completed2	0.218	5.76	9.72	0.220	5.71	9.65	0.227	5.67	8.37
3.Failed	0.249	22.99	28.06	0.249	20.52	26.49	0.252	18.96	23.78
Test of difference between means for groups 1,2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 1 & 2		0.16	0.86		0.10	0.91		0.05	0.95
Groups 1 & 3		-0.86	0.38		-0.94	0.34		-0.86	0.38
Groups 2 & 3		-0.56	0.57		-0.54	0.58		-0.45	0.63

Table 5.4.6 Targets' CAAR's for the months (3, +26).									
	Market Model			Market Adj.Return Model			Mean Adj.Return Model		
	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)	CAAR	t(d)	t(i)
Whole sample	0.054	8.62	10.01	-0.018	-2.92	-6.90	0.071	9.79	11.48
1.Completed1									
2.Completed2	0.343	9.06	3.17	0.454	11.76	6.08	0.327	8.17	2.49
3.Failed	0.043	3.98	6.26	-0.049	-4.04	-4.64	0.061	4.61	4.17
Test of difference between means for groups 2 & 3.									
		t-st.	Prob.		t-st.	Prob.		t-st.	Prob.
Groups 2 & 3		0.28	0.77		1.84	0.06		0.08	0.93

Table 5.4.7 Total returns of the reduced sample (1979-1989) for the (-3, +2) months.			
Panel A. Market Model			
	CAAR	t(d)	t(i)
Whole sample	0.020	3.82	7.37
1.Completed1	0.030	5.14	7.35
2.Completed2	-0.130	-5.13	-3.29
3.Failed	0.033	3.09	3.93
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		1.84	0.08
Groups 1 & 3		-0.04	0.96
Groups 2 & 3		-1.83	0.08
Panel B. Market Adjusted Return Model			
Whole sample	0.053	9.72	13.98
1.Completed1	0.065	10.17	13.03
2.Completed2	-0.051	-2.05	0.47
3.Failed	0.049	4.70	5.78
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		1.46	0.16
Groups 1 & 3		0.54	0.58
Groups 2 & 3		-1.25	0.23
Panel C. Mean Adjusted Return Model			
Whole sample	0.031	5.23	8.13
1.Completed1	0.044	7.16	7.98
2.Completed2	-0.212	-7.57	-6.25
3.Failed	0.059	4.38	5.91
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		2.81	0.01
Groups 1 & 3		-0.53	0.59
Groups 2 & 3		-2.93	0.01

Table 5.4.8 Total returns of the reduced sample (1979-1989) for month 0.			
Panel A. Market Model			
	CAAR	t(d)	t(i)
Whole sample	0.038	7.24	9.27
1.Completed1	0.039	6.62	7.49
2.Completed2	0.038	1.52	3.50
3.Failed	0.034	3.20	4.45
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		0.01	0.98
Groups 1 & 3		0.33	0.74
Groups 2 & 3		0.12	0.90
Panel B. Market Adjusted Return Model			
Whole sample	0.044	8.15	10.39
1.Completed1	0.046	7.25	8.53
2.Completed2	0.049	1.99	3.86
3.Failed	0.037	3.61	4.78
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		-0.12	0.90
Groups 1 & 3		0.58	0.56
Groups 2 & 3		0.44	0.65
Panel C. Mean Adjusted Return Model			
Whole sample	0.041	6.92	7.97
1.Completed1	0.041	6.67	6.48
2.Completed2	0.050	1.79	3.23
3.Failed	0.037	2.71	3.65
Test of difference between means for groups 1,2 & 3.			
		t-st.	Prob.
Groups 1 & 2		-0.23	0.81
Groups 1 & 3		0.30	0.76
Groups 2 & 3		0.34	0.73

CHAPTER 6

EXPLAINING THE WEALTH GAINS AND THE MOOD OF TAKEOVER BIDS

6.1 Introduction

In this chapter we attempt to determine the factors which are critical for the creation of wealth gains for the shareholders of bidding, target and combined firms in the period surrounding the announcement of bids. One of these factors is the mood and because it is possible that this variable is interrelated with wealth gains we shall also examine the determinants of the mood of bids.

Previous empirical evidence showed that the final wealth gains reaped by target shareholders depend on the prevalent mood of the bid. For example, **Walkling (1985)** found that hostile bids result in higher wealth gains for target firm shareholders. It has also been argued by **Baron (1983)** that the mood of a bid depends on the premium offered to the target shareholders. Under Baron's theory, managers decide to resist a bid either because the premium offered is too low or because they have a strong preference for control. In the first case managers act as value maximisers and we should expect that the lower the bid premium the higher the probability that the bid will be hostile. However, in the latter case managers will tend to resist the bid even if the premium offered is high. We believe that the above findings suggest that the wealth and mood variables may be mutually dependent. Therefore, we are going to examine the wealth effects and mood of takeover bids using a simultaneous equations framework. We shall also test the statistical endogeneity of the wealth and mood variables and apply the appropriate estimator.

This chapter is organised as follows. Sections 6.2 and 6.3 review the main empirical studies investigating the determinants of both merger premia and the mood of bids. Reviewing the relevant literature we identify a number of variables which have appeared to be significant in explaining the behaviour of each variable in the light of which we are able to develop our hypotheses.

Section 6.4 describes our database and defines the variables used while section 6.5 discusses a number of methodological issues including the Hausman approach to the endogeneity problem.

Section 6.6 presents the regression results obtained regarding the determinants of targets' wealth gains and mood of bids. Sections 6.7 and 6.8 examine the determinants of wealth gains for bidders and the combined firms. Finally, section 6.9 discusses our results in comparison with previous findings and draws some conclusions.

6.2 A review of the literature and hypotheses set regarding the wealth gains.

A vast number of US and UK studies have explored the determinants of takeover gains. This section presents the findings of these studies and sets our hypotheses. At the end of section 6.4, which defines the variables used, we provide table 6.1 which shows the expected sign of the relationships that, according to our hypotheses, exist between wealth gains and the explanatory variables included.

Mood of the bid.

The mood of a bid is determined by the reaction of the management of the target firm to the proposed offer. There are two hypotheses regarding the resistance of management.

The first one is the **shareholder-welfare hypothesis** which

claims that managers resist in order to obtain a higher valuation for their company and a higher bid premium for their shareholders. Thus, they maximise shareholder's wealth.

The second hypothesis is the **managerial-welfare hypothesis** which argues that managers resist the offer driven by motives, such as retainment of their jobs and other related privileges, which can be detrimental to shareholders' interests if the likelihood of a successful takeover is reduced. However, if a rival bidder joins the fray and the takeover is completed then it is more likely that the target's wealth gains will be higher. Thus, the managerial-welfare hypothesis does not exclude the possibility that shareholders may eventually reap higher wealth gains.

In one of the first studies examining bid premia, **Walkling (1985)** found that a higher premium (measured in terms of abnormal returns) for target shareholders arises when the management of the target company decide to resist the offer by taking actions to block the takeover, in other words when the mood of the bid is hostile. This finding supports the shareholder-welfare hypothesis. Similar results were also obtained by **Kummer & Hoffmeister (1978)** and **Varaiya (1987).**

However, **Walkling & Edmister (1985)** and **Huang & Walkling (1987)** did not find any significant relationship between managerial resistance and size of bid premium, while **Dodd (1980), Dann & DeAngelo (1983)** among others[1] discovered a negative impact of defensive actions on target share prices offering evidence in support of the managerial-welfare

[1] Defense actions which are not subjected to shareholders' vote, such as standstill agreements, or poison pills were found to have a detrimental effect on shareholder's wealth [**Dann & DeAngelo (1983), Malatesta & Walkling (1985)**], partly because they are very costly and partly because they substantially reduce the probability of a successful acquisition.

hypothesis.

We expect that hostile bids will increase the abnormal returns of target firm's shareholders for two reasons. The first is the resistance of the old management team which will cause the bidder to increase the final premium paid to shareholders and the second is the possibility that the market will positively evaluate the prospect of replacing an inefficient management team anticipating that higher wealth gains are likely to arise in the post-merger period as a result of the correction of managerial failure. Thus, although we adopt the managerial-welfare hypothesis we expect that managers' resistance may eventually lead to an increase in shareholder's wealth. The predicted sign of the relationship between target's wealth gains and hostile bids is therefore positive.

As regards to bidders it has been documented in some early studies, reviewed by **Jensen & Ruback (1983)**, and in more recent ones [**Franks & Harris (1989)**, **Limack (1990)**], that resisted bids decrease the returns of these companies. Bidding companies tend to realise lower wealth gains in hostile bids either because of hubris or the increased degree of competition which leads to overpayment especially in the case of a "white knight".

Based on the argument that hostile bids are made to replace inefficient management we consider that it is possible that the bidder might also gain from infusing his better management upon a target company with underutilised resources. If this is anticipated by the market bidder's shareholders will reap higher abnormal returns. Thus, the predicted sign of the relationship between bidder's gains and hostile bids is ambiguous depending on the extent that the market believes that correcting managerial failure offsets possible costs of overpayment.

Bidder's toehold.

The pre-merger equity interest (toehold) of the bidder on the target firm is a proxy for the **bargaining strength** of the bidder. According to the bargaining strength hypothesis, bidders with a large toehold should attain higher gains (or smaller losses) and targets should realise a lower level of bid premium.

Walkling (1985) provided evidence that the bid premium is ultimately influenced by the proportion of shares already held by the bidder. The higher is the bidder's toehold, the smaller the fraction of shares needed to be tendered in order to enable the bidder to obtain control over the target company. This makes it less likely that the management of the target firm will decide to resist and in this case it is expected that a lower bid premium will be paid. Thus, the bidder's toehold affects both the mood of the bid and the size of bid premium.

Walkling & Edmister (1985) and **Stulz, Walkling, & Song (1990)** also empirically showed that a higher bidder's toehold had a negative impact on merger premia obtained by target shareholders. However, **Franks & Harris (1989)** found a non-linear relationship between bidder's toehold and bid premium using UK data. They discovered that when the pre-merger equity interest of the bidder exceeds 30% the bid premium declines.

This leads us to predict a positive relationship between bidder's toehold and bidder's wealth gains and a negative relationship between bidder's toehold and target's wealth gains.

The degree of competition.

The degree of competition in the market for corporate control is expressed by the number of rival bidders and reflects the bargaining power of the target company. It is

expected that the competition among bidders induces an auctioneering process which in turn causes the "winner's curse" effect[2]. Thus, the final premium paid to the acquired firm's shareholders and the acquisition cost to the bidder's shareholders will eventually increase.

This argument has been documented in many empirical studies, such as those of **Walkling & Edminster (1985), Varaiya & Ferris (1987), Varaiya (1987), Bradley, Desai & Kim (1988), Franks, & Harris (1989), Stulz, Walkling & Song (1990)** and **Slusky & Caves (1991). Datta, Pinches & Narayanan (1992)** using a meta-synthetic analysis of the findings of 41 studies[3], concluded that the presence of multiple bidders was one of the four factors which consistently explained higher wealth gains for target company's shareholders.

In the light of the above findings, we expect that the existence of rival bidders will be positively related to target's wealth gains but negatively related to bidder's gains. In other words single bids are expected to generate higher returns for bidders but lower returns for targets.

Directors and other large shareholdings.
The division of share ownership among shareholders, directors and institutions is also assumed to have an influence on the level of wealth gains for bidding and target companies.

As regards to the role of **directors' shareholdings** in target firms, two main theories have been established, namely the

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[2] The "winner's curse" effect occurs in a bidding situation in which the value of the target company is not known with certainty and this causes each bidder to bid higher than the others. As a result, the bidder who wins has eventually overpaid to acquire the target company.

[3] The researchers in the above study included a variable in their meta analysis, only if at least five previous empirical studies had examined it.

incentives-alignment hypothesis by **Jensen & Meckling (1976)** and the entrenchment hypothesis by **Fama & Jensen (1983)** and **Stulz (1988)**. Jensen & Meckling argued that a higher stake of equity in the hands of directors would reduce the agency conflict which exists between them and shareholders; managers will have an incentive to maximise the share-holders' wealth since by doing so they maximise the value of their own holdings.

Under this theory, managers of target companies are expected to show less resistance to a potential takeover and are willing to accept a lower premium[4] rather than lose the opportunity of tendering their shares thereby capturing the large benefits of the takeover. **Walkling & Long (1984)** and **Slusky & Caves (1991)** provided evidence supporting this theory. **Stulz, Walkling & Song (1990)** empirically showed that a higher level of managerial shareholdings in target companies was associated with larger bid premia obtained by their shareholders only in multiple contested bids. Furthermore, **Song & Walkling (1993)** found that managerial shareholdings increased the target's gains only when the takeover was completed.

On the other hand, **Stulz (1988)** developed a theoretical model which predicts that when directors increase their equity stake up to a critical level the value of the firm increases because they align their interests with those of the other shareholders. Above this critical level they can effectively entrench themselves against the bidder's takeover plan using their voting rights and while this increases the final premium obtained it also reduces the probability of a successful outcome.

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[4] If the target firm is highly valued prior to the bid, as a result of the profit-maximization policy of managers, the probability that the company is undervalued is lower and therefore the expected bid premium should also be smaller.

Morck, Shleifer & Vishny (1988b) also found that there is a critical level of directors interests of 5% up to which the value of a firm increases and beyond that and up to 25% it starts to fall because managers are well entrenched. However, they also found that beyond 25% of directors shareholdings the value of the firm begins to increase again but at a slower rate. Similar results were also reported by **McConnell & Servaes (1990)** who found a curvilinear relationship between Tobin's Q ratio and managerial ownership. The above two studies suggest the existence of a non-linear relationship according to which we have alignment up to a certain level of managerial shareholdings while above that we have entrenchment.

We consider that the relationship between managerial ownership and wealth gains is ambiguous depending on the trade-off between the managers preference for control and their preference for maximising the value of their shareholdings. If managers enjoyed more benefits prior to the bid-period from a non-value maximisation policy they will prefer to entrench themselves against the predator using the large block of shares they control. In this case they will attempt to cancel the takeover and in general higher bid premia should be expected. However, if managers are interested in maximising the value of shareholder wealth they will attempt to obtain the highest possible bid premium and secure that the takeover will go through. In this case we should expect in general lower bid premia because managers will be more concerned to secure the takeover even at a lower premium.

We shall also examine the directors interests in a non-linear form. However, as a result of the above ambiguity, we consider that we cannot predict the exact sign of the relationship between directors interests and wealth gains of target companies.

As far as bidding firms are concerned, the literature regarding the relationship between directors interests and wealth gains is not as extensive as for target firms. Under the incentives-alignment hypothesis a higher managerial equity stake would reduce the agency problem in bidding companies and hence their managers would not engage in value decreasing acquisitions. The findings of **Lewellen, Loderer & Rosenfeld (1985)** and **Amihud, Lev & Travlos (1990)** for US acquisitions support this theory by showing that takeovers which generated negative returns for the acquiring firms were associated with a low level of directors shareholdings.

It is also possible that a non-linear relationship between management shareholdings and wealth gains also exists for bidders. Despite the above evidence about a positive effect of managerial interests in the bidding firm, we consider that the same ambiguous relationship (alignment vs. non-alignment) may apply for bidders. A high level of directors shareholdings can motivate managers to make value increasing acquisitions or value decreasing acquisitions depending again on the trade-off between managers preference for a value maximisation policy and growth in size. Thus, we do not predict a specific sign for the relationship between bidder's directors interests and wealth gains though, once again we specify a non-linear form.

Regarding the role of major shareholdings, **Shleifer & Vishny (1986)** developed a theoretical model which explains the behaviour of large shareholders in a firm and their monitoring role. The main idea of this model is that if a large shareholder[5] (members of owner's family or more frequently institutions) believes that the more efficient way of improving corporate performance is to replace the existing management he can accomplish this objective either

[5] Institutions not only hold a fraction of shares but also often participate in the management team of the company appointing the so-called outside directors.

by selling his shares to the bidder (even at a lower price) or by initiating a hostile bid against the management and obtaining the effective control of the company himself.

The higher is the institutional ownership stake the smaller the fraction of shares required to acquire the target company. Consequently, under this hypothesis we expect that the resistance of the managers will be limited and hence the bid premium will be smaller. The bid premium is also likely to be lower because if institutions have effectively performed their monitoring role in the past the market value of the target company will be high offering little scope for undervaluation. Thus, institutions by siding with internal shareholders' interests can increase the firm's value and the probability of a successful outcome but they can also lower the probability of a higher bid premium.

The empirical evidence regarding the validity of the above hypothesis is mixed. Thus, **Brickley, Lease & Smith (1988)** confirmed the monitoring role of large external shareholders except in the case of institutions such as pension funds and insurance companies, of which the target company may be a potential client. Furthermore, **Hill & Snell (1989)** showed that a higher concentration of equity amongst a small number of institutions increases their monitoring role. **Stulz, Walkling & Song (1990)** claimed that institutional investors will be more willing to sell their shares for a lower premium (if this guarrantees a successful outcome) because of their low tax obligations. They manifested the existence of an inverse relationship between institutional shareholdings and target gains. Also, **Slusky & Caves (1991)** found evidence of a similar negative relationship between institutional shareholdings and bid premium.

On the other hand, **Herman (1981)**, **Mintz & Schwartz (1985)**, found that institutional shareholders are in general passive investors who tend to side with directors, whereas **Pound**

(1988) found that large shareholders such as institutions, due to existing mutual business relationships, are likely to support managers in proxy contests and thus act against the shareholders interests.

Bidding firms shareholders are expected to gain from large institutional shareholdings, because institutional investors will attempt to maximise the value of their holdings by selecting the value increasing acquisitions. **You, Caves & Smith & Henry (1986)** were the first to find evidence in favour of this argument. Also, **Slusky & Caves (1991)** found that bidding companies shareholders make more gains when their management are monitored by institutional stockholders or in other words when the proportion of inside to outside members in the board is low. On the other hand, **Aziz & Mortazavi (1993)** failed to prove any significant relationship between institutional shareholdings and wealth gains of acquiring firms. However, in general little has been done to examine the effect of institutional interests on acquiring firms gains.

Since the previous evidence is not conclusive regarding the relationship between the large shareholdings and the wealth gains of target and bidder shareholders we do not predict a specific sign leaving again the data to determine this issue.

Up to this point we have examined the impact of directors and institutional interests of the bidding company on its wealth gains and the impact of directors and institutional interests of the target company on its wealth gains. However, we consider that we can also test the influence of bidder's agency situation on the target wealth gains and the agency situation in the target company on the bidder wealth gains. **Slusky & Caves (1991)** found that a high level of bidder's directors shareholdings reduces the size of bid premia reaped by target shareholders. Due to the ambivalent

nature of the association between managerial interests and wealth gains in both bidding and target firms described above, we decided again to make no prediction about the signs of these relationships.

We shall also test the impact of large shareholders in the bidding company on the wealth gains of the target company and the impact of large shareholders in the target company on the wealth gains of the bidding firm. However, due to the ambiguity of the role of large shareholders already mentioned we adopt the same approach of leaving the data to decide about the direction of the relationships examined.

Finally, we aim to test the effect of target's and bidder's directors shareholdings as well as the impact of large shareholdings on the combined firm returns. The main reason of doing this is to find the combined effect of the agency problem which exists in both firms on the total gain created. Given the ambiguity of the role of directors and large shareholdings variables on the wealth gains we again face the same problem of being unable to predict the signs of the relationships examined.

Financial synergies.

One factor which was assumed to influence the wealth created for the combined firm is the **difference between the level of gearing of the bidding firm and the target company.** This variable is a proxy for the degree of financial synergies generated. One typical aspect of financial synergies described in chapter 2 is the co-insurance effect [**Lewellen (1971)**] which applies in the case of conglomerate mergers. However, financial synergies can be generated in every merger that there is a difference in the gearing level between the bidder and target company. In other words, whenever there is a latent debt capacity either from the bidder's or the target's side which can increase the total optimal level of debt that the combined firm can undertake

in the post-merger period then various benefits of debt financing, such as tax allowances, can materialise.

Myers & Majluf (1984) first developed a model describing the case of bidder's latent debt capacity. They predicted that under assymetric information bidders with a low level of debt but a higher level of cash (greater financial slack) will acquire targets with a higher level of debt but a lower level of cash (low financial slack). **Bruner (1988)** and **Slusky & Caves (1991)** empirically confirmed the existence of financial synergies and found a positive impact of the gearing difference on the wealth gains.

In relation to the above, we assume that a difference in the level of gearing between the bidder and the target will increase the wealth gains for both companies. The bidding company will gain in the post-acquisition period from the latent debt capacity of the target company. In anticipation of the benefits that the acquirer can exploit in the post-merger period the target company will also receive a higher bid premium. This will also have a positive impact on the total gain made by the combined firm.

Mode of payment.

The bidder can use cash, equity, debt (debentures) or any combination of these to pay the shareholders of the target company in order to sell their shares. Previous empirical research has examined whether cash or equity gives higher returns. Financial theory suggests two main arguments for explaining this issue. The first is the **uncertainty and information assymetries** argument and the second is the **taxation** argument.

In a world of information assymetries [**Myers & Majluf (1984)**], the bidder has private information about the true value of his equity that the target does not have and the target has similar information about its stock that the

bidder does not have. Under these circumstances a bidder will prefer to finance the takeover by using equity if his stock is overvalued. If target shareholders anticipate this they will demand more bidder's shares which in turn will result in a reduction of bidder's gain and the dilution of control[6] in bidder's firm.

In addition to the above, payment with equity creates a valuation risk problem for the bidder and target. The value of the offer is determined ex-post contingent on the profitability of the combined group after the merger, while a cash offer is determined ex-ante and there is no uncertainty about the value of cash. This may explain why target and bidder shareholders often prefer cash rather than equity, but at the same time can explain why target shareholders may ask for a higher bid premium in an equity offer in order to compensate them for the specific risk associated with the bidder's equity. The logic of "a bird in hand is worth more than two in the bush" may prevail among target shareholders. Therefore, under this argument we should expect that the bidder might give a higher premium when he makes an equity offer in order to safequard target shareholders against the uncertainty in the post-merger period.

The second argument of taxation states that an all cash offer will generate higher returns for target shareholders. This is due to the fact that the bidder must increase the bid premium in order to compensate the target shareholders for carrying the obligation[7] to pay capital gains tax on the

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[6] Dilution of control in the bidding firm will occur because an equity offer will increase the total number of shareholders and decrease the fraction of shares held by major shareholders, such as institutions, managers or other groups of large shareholders.

[7] UK legislation gives the ability to shareholders who accept payment in equity or debt to avoid paying capital gains tax until they sell the shares received.

shares they sell. If this occurs then the bidder's returns may decrease. However, as **Franks, Harris & Mayer (1988)** showed, the introduction of capital gains tax in the UK was not responsible for the higher returns offered in all cash offers.

Moreover, there is another reason suggesting higher returns to bidders who use cash rather than equity and this is the longer period of time that equity bids need for completion of a deal compared to the time required for cash bids. More specifically, if the bidder makes an equity offer he must obtain the approval of the Stock Exchange authorities before the target shareholders start selling their shares. During this period, which can take several months, a target company can better organise its defense strategy, attract a "white knight" and achieve a higher premium. **Wansley, Lane & Yang (1983)** provided evidence for US data to support this argument. On the other hand, cash offers provide a quicker way to accomplish a merger deal reducing the potential bidder's losses.

In general the majority of empirical studies [e.g. **Huang & Walkling (1987); Franks, Harris & Titman (1991); Slusky & Caves (1991); Datta, et.al. (1992)**] showed that cash offers give higher returns for bidding and target companies. Only, **Eckbo, Giammarino & Heinkel (1990)** using Canadian data showed that mixed offers (a combination of cash, equity, etc) give on average higher returns for acquiring firms than pure cash or pure equity offers.

The above empirical evidence suggests the superiority of cash offers over equity offers suggesting the taxation argument. However, it is possible that if the uncertainty argument holds the equity offers may give higher returns than cash offers. Therefore, we consider that is appropriate to leave the data to determine the exact sign of the relationship between cash offers and bidder, target and

combined firm returns. The same also applies to the other types of payment.

Degree of industrial relatedness and Relative Size of Bidder.

It had been hypothesised that the industrial relatedness explains some part of the gains divided between bidding and target firms. **Salter & Weinhold (1979)**, **Singh & Montgomery (1987)** and **Shelton (1988)** argued and empirically showed that more gains were generated in the case of related mergers, because of operating synergies and easier transfer of managerial skills from the acquirer to the acquired firm.

However, other studies supported the theory that unrelated mergers may provide a lower bankruptcy cost due to the diversification of risk [**Amihud & Lev (1981)**, **Higgins & Schall (1975)**] and the co-insurance effect of debt [**Lewellen (1971)**, **Kim & McConnell (1977)**, **Choi & Philippatos (1983)**]. As a result of the above arguments, the debt capacity of the combined firm in a conglomerate merger can increase leading to tax savings such as higher tax shields on interest payments [**Galai & Masulis (1976)**]. Also, **Elgers & Clark (1980)** provided empirical evidence supporting the theory that unrelated mergers lead to higher gains due to financial synergies.

However, there is another group of studies which did not detect any significant relationship between industrial relatedness and wealth gains ; in these studies we can include those of **Seth (1990)**, **Slusky & Caves (1991)**, **Datta, et.al. (1992)** and **Limmack (1990, 1993)**. Although, Seth (1990) did not find that the degree of relatedness was important in explaining merger gains, he discovered that in related acquisitions the size of the target relative to bidder explains most of the gains accrued to the combined firm due to changes in operating decisions.
More specifically, he found that the larger the target

company relative to the bidder the higher is the potential for increased market power, managerial economies and economies of scope[8] and consequently higher wealth gains will arise for the bidder and the combined firm. Seth also found that in unrelated mergers gains are generated from the increased debt capacity and the co-insurance effect.

With respect to the above, we hypothesize that related bids will generate higher wealth gains for the bidder, target and the combined firm due to the operating synergies created. Thus, we expect a positive relationship between related bids and wealth gains. Furthermore, we predict a positive sign between the relative size of bidder to target and wealth gains since we expect that related mergers will increase the wealth gains.

Tobin's Q ratio.

Tobin's Q ratio is defined as the ratio of the market value of the securities of a company over the replacement cost of its physical assets. Tobin's Q ratio basically reflects the market valuation of the intangible assets[9] of a firm. In most of the empirical studies examining takeovers Tobin's Q ratio has been used as a proxy for management efficiency and investment opportunities.

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[8] Thus, they confirmed the earlier findings of **Asquith, Bruner & Mullins (1983)** for bidder gains associated with higher operating synergies due to the large size of target company. However, **Limmack (1990, 1993)** failed to obtain any significant relationship between bidder's size and wealth gains.

[9] The intangible assets of a firm can incorporate future growth opportunities, monopoly power, quality of mamagement, goodwill or rents appropriated away from unions (**Morck, Shleifer & Vishny (1988a)**]. Tobin's Q ratio can also reflect a mispricing problem by the market.

Thus, **Walkling & Edmister (1985)** using the valuation ratio[10] (market to book value) of target companies they discovered that targets which had been valued at a low level by the market prior to the bid for the quality of their management they obtained a higher premium when the bid was announced. This occurs because the market anticipates that the merger will improve efficiency by removing the incumbent poor management team.

Also, **Lang, Stulz & Walkling (1989)** showed that bidders which had a high Q ratio before the bid experienced larger gains in the announcement period. The market rewards these companies with higher abnormal returns anticipating that their superior management will help them to make profitable acquisitions. Furthermore, **Lang, et.al. (1989)** and **Servaes (1991)** found that the takeovers which produce higher gains for both bidders, targets and the merged firm are those in which targets of low Q ratios are acquired by bidders of high Q ratios. These results show that when badly managed companies are taken over by well managed firms the total wealth of the combined firm increases because the market anticipates the creation of managerial synergies and the correction of managerial failure.

With respect to the above we predict a negative relationship between the target's valuation ratio and his wealth gains. We also expect that higher wealth gains will result in the bidding, target and the combined firms when a bidder with a high valuation ratio acquires a target with a low valuation ratio. Based on the same argument we should expect that a highly valued bidder, due to the quality of its management and investment opportunities, will make more value increasing acquisitions.

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[10] The valuation ratio is a legitimate proxy for Tobin's q ratio which was first introduced by **Marris (1964)** to measure management efficiency.

Free cash flow.

The free cash flow hypothesis was proposed by **Jensen (1986a)** to explain takeover activity. According to Jensen, free cash flow is defined as the cash flow remaining at the discretion of managers after the company has invested in all available positive net present value projects. A high level of free cash flow aggravates the agency problem because it enables managers to use this amount of free cash flows to invest in projects with negative net present value. Thus, they may engage in value decreasing acquisitions. Furthermore, a high level of free cash flow in bidding firms will make them pay large premia to target shareholders making a transfer of wealth from acquirers to acquirees.

This argument was empirically tested by **Lang, Stulz & Walkling (1991)**. Given that the Tobin's Q or the valuation ratio reflects the investment opportunities, they defined the free cash flow as the cash flow when the level of investment opportunities is low, in other words when the Tobin's Q ratio is low[11]. Although, they found a negative relationship between bidder's abnormal returns and a high level of free cash flows, their evidence failed to support the transfer of wealth argument because they did not detect that target returns were significantly associated with the level of bidder free cash flows.

We also hypothesize that bidders with a high level of free cash flow will make the lowest returns. Thus, we expect a negative sign for bidder's, gains and bidder's free cash flow but a positive sign for target's gains and bidder's free cash flow. However, we cannot predict the sign of the relationship between bidder's free cash flow and combined firms's gains.

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[11] The set of investment opportunities will be low due to the free cash flow invested in negative net present value projects.

Business cycles.

It has been observed that merger activity increases in times of rising economic activity [**Nelson (1959, 1966), DeBondt & Thompson (1992)**]. In such periods of favourable economic conditions and less uncertainty, managers are more likely to engage in takeover plans because they envisage more investment opportunities to arise.

Although there is no complete theory to explain merger waves and the premia arising in these periods, there have been several propositions to illuminate this phenomenon such as the "disturbance" hypothesis of **Gort (1969)**, the expansiveness of managers in periods of economic prosperity [**Reid (1968)**], the "overreaction" hypothesis of financial markets by **DeBondt & Thaler (1985)** and the "investment opportunities " hypothesis for conglomerate mergers of **Weston, Chung & Hoag (1990)**. The association between mergers and business cycles may explain why higher returns for bidding and target firms have been measured in some studies [**Limack (1990), Wong, et.al. (1993)**] over a boom period of economic activity.

We predict that managers of bidders due to hubris will tend to overestimate the value of their acquisition targets in periods of rising economic activity leading to a transfer of wealth from acquiring to acquired companies. Thus, it is more likely that targets will receive higher premia in a boom period. Since, we expect a different impact of this variable for bidder and target then we cannot predict the impact for the combined firm.

6.3 A review of the literature and hypotheses set regarding the mood of the bids.

In contrast to the extant literature of studies examining the wealth gains there have been only a few studies investigating the determinants of the mood of bids. As far as we aware, there is no UK study dealing with this issue and hence our research aspires to cover this discrepancy. This section highlights the factors that previous research showed to be critical in determining the mood of bids and sets our hypotheses accordingly.

Target's wealth gains or bid premium.

We decided to examine first this factor since we believe that wealth and mood are mutually dependent. As, **Baron (1983)** argued managers in target companies can be divided into two main groups. The first contains those managers who reject an offer because they believe that the bid premium is too low and who expect to receive a higher premium and the second includes those who reject a bid because they simply want to retain control of the firm. Baron then claims that the market will be able to identify the target companies in which managers of the first group resist in order to raise the final premium from those that genuinely oppose the offer because they do not want to give up control. The market then will reward the first group of companies with higher wealth gains while it will punish the second group with lower returns due to the non-value maximising behaviour of their managers.

Under Baron's theory, in both groups of companies managers will resist a bid if the premium offered is low suggesting a negative relationship between the wealth gains and the probability that the bid will be hostile. However, under the theory of **Morck, Shleifer & Vishny (1988a)** about the role of disciplinary bids the above relationship can be positive. Morck, et.al., argued that target companies which have performed badly in the past will receive disciplinary bids

which will lead to the replacement of the inefficient management team. These bids, although they offer higher wealth gains to target shareholders than synergistic bids in anticipation of the gains from increased managerial efficiencies, are likely to be resisted from the incumbent management team.

Walkling & Long (1984) did not detect any significant relationship between the mood of a bid and the level of bid premium offered to target shareholders contradicting Baron's theory. However, they found a negative association between the mood and the total change in managerial wealth[12].

Based on the two arguments derived from Baron's and Morck, et.al. models and the empirical evidence offered by Walkling & Long we leave open the exact sign of the relationship between the target's wealth gains and the probability of a hostile bid.

The Tobin's Q ratio of the target company.

Baron (1983) was the first to develop a theoretical model predicting that the decision of managers of the target firm to resist a takeover bid is influenced by the value of their firm. He claimed that when managers adopt a non-value maximising policy the market value of the company declines and the company in turn becomes a takeover target. In this case, the managers jeopardise their jobs and other privileges and thus they will attempt to block the acquisition.

Morck, Shleifer & Vishny (1988a) examining some financial characteristics of target firms empirically confirmed the above theory of Baron. They showed that target companies with low Tobin's Q ratios are more likely to receive hostile

[12] The total managerial wealth incorporated the bid premium offered to the managers divided by their annual salary.

bids while target firms with high Q ratios are more likely to attract friendly bids. They also argued that in the first case the market exercises its disciplinary mechanism of hostile takeovers to correct managerial failure while in the second case friendly bids occur in order to create synergistic benefits by joining the assets of two firms.

In the light of the above theory and findings we also hypothesize a negative association between the target's valuation ratio (our proxy for Tobin's Q) and the hostility of the bid.

Directors and other large shareholdings.

There are two main reasons suggesting that the probability of hostile bids will be high when the target's directors shareholdings are low. The first is based on the allignment hypothesis of **Jensen & Meckling (1976)** which predicts that managers pursue a value maximising policy when they own a large equity stake. In this situation the value of the firm will already be high and we should not expect to have many hostile bids. However, the smaller the managerial equity stake is the higher the managers' preference for control and compensation will be [**Baron (1983)**] and the more likely it is that the bid will be hostile.

The second reason is associated with the fact that the bidder will be encouraged to make a hostile bid when managers in the target firm hold a low fraction of shares, because in this case they are less likely to show substantial resistance which can threaten to cancel the takeover. Thus, in this case a hostile bid has a higher probability of success.

Walkling & Long (1984) revealed that a low level of directors' interests and a high level of managers' compensation are associated with hostile bids and higher management resistance, because in this case managers' wealth

depends more on their salary, fringe benefits, bonuses and other perquisites than on the value of their shareholdings. They also found that managers were relatively overpaid in resisted bids in contrast with non-resisted offers in which they were underpaid. **Morck, Shleifer & Vishny (1988a)** also documented that the higher is the directors' ownership the more likely it is that the bid will be friendly.

Aiming to test the impact of directors shareholdings on the mood of a bid, we also predict a linear negative relationship between the level of managerial shareholdings and hostile bids.

Under the monitoring role hypothesis of large shareholders argued by **Shleifer & Vishny (1986)** and described in the previous section, institutional and individual large shareholders will be more willing to sell their shares if they believe that the takeover will maximise the value of their holdings. Also, the fact that some of the institutions do not have to pay capital gains tax (e.g. pension funds, investment and unit trusts) should make it more likely that these investors with their non-executive managers appointed to the board of directors will influence the mood of a bid to be friendly.

However, the behaviour of large shareholders can be ambivalent since they might side with managers due to the existence of mutual interests [**Pound (1988)**], adopt a passive role in takeover contests [**Mintz & Schwartz (1985)**], or simply resist the takeover bid because they want to obtain a higher premium and maximise the value of their shareholdings. Therefore, we do not predict the sign of the relationship between large shareholdings and mood of bids.

Bidder's toehold.

Walkling & Long (1984) tested the impact of bidder's toehold on the mood and found that a large bidder's toehold was

related to friendly bids, because in this case a smaller fraction of shares needs to be tendered and this consequently reduces the probability of a successful resistance. We also expect a negative relationship between hostile bids and bidder's toehold.

The size of the target relative to bidder company.

Morck, Shleifer & Vishny (1988a) in the same study found some evidence for the existence of a negative relationship between the size of the target firm and the occurrence of hostile bids. In other words, the larger is the size of the target the lower is the probability that the bid will be hostile because in this case the hostile bidder is discouraged by the high market value of the target company. While the above argument looks plausible, it can also be true that a large size of bidder can reduce the willingess of the target management to resist. Therefore, we do not predict a specific sign of the relationship between the size of target company and hostility of a bid.

Industrial relatedness.

Walkling & Long (1984) found that unrelated mergers had a higher probability of being hostile than related ones. **Morck, et.al (1988a)** argued that the mood will be friendly when the motive of the takeover bid is the creation of synergies, whereas the mood will be hostile when the motive of the bid is the removal of inefficient management. We also hypothesise a negative relationship between related bids and the probability that the bid will be hostile.

Degree of leverage of the target company.

Some debt covenants include such conditions and terms which prevent the bidder using some assets of the target company in the way he considers to be the best. This reduces the post-merger value of target company and enhances the defense of target managers. **Stulz (1988)** argued that eventually a high gearing ratio reduces the probability of a hostile

takeover bid. Thus, we expect a negative relationship between highly geared targets and hostile bids.

Mode of payment.

It has been observed that in US mergers are usually stock offers and tender offers are cash offers [**Travlos (1987)**]. However, tender offers are likely to be hostile and mergers are likely to be friendly. There are two reasons for this phenomenon. The first is that due to legal requirements equity offers take longer time to obtain approval from the Stock Exchange authorities than cash offers and the element of time is crucial for the success of hostile bids. The second reason is based on the fact that equity offers are linked with valuation risk and information assymetry problems and therefore both merging companies would like to minimise such problems by making a friendly bid and exchanging information about the true value of their assets.

Based on the above two arguments we are going to test if the same observation of Travlos (1987) applies in the UK. Thus, we expect that hostile bids are positively accociated with cash offers and friendly bids with equity offers. However, we cannot make any prediction for any other combination of payment.

6.4 Description of sample and definition of variables.

6.4.1 Our sample.

Our database contains 178 completed takeover bids which took place during the period 1979-1989. This sample is extracted from the original sample of 354 bids for the period 1963-1989 already described in chapter 5. As we can recall from the previous chapter, the number of bids in the reduced sample for which we estimated the combined firms returns was 253 (both completed and abandoned bids). This number was further reduced to 238 bids, (from which 178 were completed and 60 were abandoned), because of data unavailability of some of the explanatory variables used in our analysis.

6.4.2 The variables used.

As mentioned at the end of section 6.1.2, the dependent variables are the wealth gains and the mood of the bids. While studies in the Finance literature have measured the wealth gains accrued to bidding and target firms shareholders in the form of abnormal returns (or cumulative prediction errors) estimated by event study methodology, studies in the Industrial Economics literature have measured target firms wealth gains in the form of the bid premia[13] captured by target shareholders.

Since in this chapter we examine the wealth gains of three types of firms, namely bidding, target and combined firms we have to use the same measure of wealth, i.e. the abnormal returns in order to obtain results which can be compared and interpreted in the same way. However, in the next chapter which deals solely with target companies we are going to make use of the bid premium definition as well as the abnormal returns definition.

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[13] The bid premium can be measured as the ratio of the difference between the value of the offer (total value or per share) and the market value (total or per share) of the target company before the bid.

Wealth gains of the bidders, targets and combined firms are measured by **WEALTH** variable and hence we have BWEALTH for bidders, TWEALTH for targets and TRWEALTH for the combined firm respectively (table 6.2). WEALTH is expressed in terms of Cumulative Average Abnormal Returns (CAAR's) which have already been calculated for the needs of chapter 5 using the standard event study methodology[14]. We decided to report the results using the WEALTH figures that have been estimated by the FR-model and measured over the (-3, +2) event window. As discussed in chapter 4 the market model adjusted for thin trading when it is estimated over a short event window gives more reliable results. We also found, that using this combination of model and event window among several others we tried, we obtained higher explanatory power.

As we can see from table 6.2 the mean value of BWEALTH (bidder's wealth gains) is -5.7%, with a standard deviation of 24.7%, a minimum value of -132.3% and a maximum value of 78.2%. The mean value of TWEALTH (target's wealth gains) is 27.9%, with a standard deviation of 32.5%, a minimum value of -96% and a maximum value of 168.1%. Finally, the mean value of TRWEALTH (combined firm's wealth gains) is 1.5%, with a standard deviation of 21%, a minimum value of -98.9% and a maximum value of 66.4%.

MOOD variable shows if the bid was friendly or hostile at the time of the announcement. The MOOD takes a value of 1 if the bid was hostile and a value of 0 if the bid was friendly. From the 178 takeover bids in our sample, 124 were friendly and 54 were hostile.

BTOEHOLD is the bidder's toehold in percentage terms before

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[14] As one can recall from chapter 5, CAAR's have been estimated using 4 models, namely the market model, the market model adjusted for thin trading (FR-model), the market index and the mean adjusted return model, over different observation periods such as (-3, +2), (0), (+3, +26).

the first announcement date. The mean value is 3.49% with a maximum value of 66.4% (table 6.2).

SINGLE shows the number of rival bidders. It takes a value of 1 if there was a single bidder and a value of 0 if there were multiple bids. 150 bids were single and 38 were multiple.

BDIRSHR and **TDIRSHR** are the variables reflecting the directors shareholdings (%) in bidders and targets respectively taken from the last financial statements of the companies before the bid. Using the directors interests in quadratic form we calculate **BDIRSHR2** and **TDIRSHR2** which are BDIRSHR and TDIRSHR raised to the power of two. The average value of directors shareholdings in bidding companies is 8.46% with a minimum value of 0.2% and a maximum value of 77.07%, while the mean value of directors shareholdings in target companies is 11.6% with a minimum value of 0% and a maximum value of 82.28% (table 6.2).

BLRGSHR and **TLRGSHR** show the total percentage of large shareholdings (equal to or greater than 5%) in the bidding and target firms prior to the announcement taken from the last financial statements of the companies[15]. The average value of BLRGSHR is 23.08%, ranging from 0% to 93.3% and the average value of TLRGSHR is 21.1% ranging from 0% to 88% (table 6.2).

BGEART and **TGEART** are the gearing ratios of bidder and targets reflecting their financial leverage. The gearing ratio was estimated as the value of total debt divided by

[15] The UK Companies Act requires that shareholdings equal to or greater than 5% have to be disclosed in the companies accounts. We do not split the groups of large shareholders into individuals or institutions because we are interested in testing the monitoring role of large investors rather than in examining the differences in the tax implications between institutions and individuals.

the book value of total assets, taken from the accounts of the last financial year before the bid. We considered this ratio to be more appropriate than a simple debt to equity ratio in order to reflect the total financial leverage of the firms in our sample.

$$GEART = \frac{BOOK\ VALUE\ OF\ TOTAL\ DEBT}{BOOK\ VALUE\ OF\ TOTAL\ ASSETS} \qquad (6.1)$$

From table 6.2 we can see that the mean value of BGEART is 0.49 with a minimum of 0.14 and a maximum of 0.76 while the mean value of TGEART is 0.48 with a minimum of 0.07 and a maximum of 1.5.

GEARDIF is the difference between the gearing ratio of the bidder and the target. GEARDIF controls for the existence of financial synergies. GEARDIF has a positive average value of 0.01 ranging from -0.98 to 0.45 (table 6.2).

BVALRT and **TVALRT** are the valuation ratios of the bidder and target respectively[16]. The valuation ratio is equal to the market value of the bidder/target company at the end of the fourth month before the bid divided by the book value of its net assets[17]. The mean value of BVALRT is 2.19 with a minimum of 0.28 and a maximum of 9.69, while the average value of TVALRT is 1.69 with a minimum of 0.061 and a maximum of 12.29 (table 6.2).

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[16] We defined the valuation ratio as Walkling & Edmister (1985) did. However, an alternative form of valuation ratio could be the market value plus the book value of debt divided by the book value of total assets.

[17] In the UK due to the existing accounting standards companies are encouraged to make more often revaluations of fixed assets and FIFO is the inventory method. Thus, the book value of assets is a good approximation of the true replacement cost of Tobin's Q ratio.

$$VALRT = \frac{MARKET\ VALUE\ (-4)}{BOOK\ VALUE\ OF\ NET\ ASSETS\ (-4)} \qquad (6.2)$$

VALRDIF is a dummy variable which is equal to 1 if the bidder has a high valuation ratio and the target has a low valuation ratio and equal to 0 otherwise. It is widely accepted in the pertinent literature that a valuation ratio above 1 is considered to be high and a valuation ratio below 1 is considered to be low [**Lang, et.al. 1989, 1991**)].

INDFIT shows the degree of industrial relatedness between bidders and targets. Industrial relatedness has been defined using the the Stock Exchange Industrial Classification Codes (SEIC). INDFIT is equal to 1 if the merged firms were in the same industry (related) and is equal to 0 if the companies were in a different industry (unrelated). Thus, 67 takeovers were related bids while 111 were unrelated ones.

P1,P2,P3,P4,P5 are the variables representing the different forms of payment[18]. They are expressed in binary terms. Thus, P1 is equal to 1 if the bid was solely financed by cash, otherwise it is zero. P1 includes 11 pure cash offers. P2 is equal to 1 if the form of payment was pure equity, otherwise it is 0. P2 has 28 all equity offers. P3 is set to 1 if the bidder used a combination of cash and equity to buy the target's shares, otherwise it is 0. This combination was used in 20 bids. P4 is equal to 1 if the offer was in the form of cash with an equity alternative, otherwise it is 0. This combination was used in 68 bids. Finally, P5 is equal

[18] In order to avoid the problem of perfect multicollinearity in the multiple regression analysis that follows, we shall exclude one of the dummy variables of payment. Since we are primarily interested in comparing the performance of cash vs. equity offers, we drop the P1 variable and we compare the performance of all the other modes of payment with cash. Thus, if for example P2 generates a negative sign this will indicate that equity offers give lower returns than cash offers.

to 1 if any other combination except those mentioned above was used, otherwise it is 0. 51 offers were included in this category. Eleven different types of combination between cash, equity and debt were used[19].

CYCLE variable is the proxy we constructed for the business cycles[20]. It takes the value of 1 if the bid occured during a boom period of economic activity and 0 if the bid coincided with a period of recession.

LSIZE is the last variable reflecting the relative size of bidder to target (in log form to avoid the influence of outliers) reflecting the relative bargaining strength of bidder and target. It has the form :

$$LSIZE = \log\left(\frac{MV_B(-4)}{MV_T(-4)}\right) \qquad (6.3)$$

BFCFLOW1 and **BFCFLOW2** are the free cash flows of the bidder based on two different definitions of cash flows. We adopt the same definition of free cash flow with that used by **Lang, et.al. (1991)** who combined the cash flow of the bidder with the set of his investment opportunities expressed by the Tobin's Q. In our case we use the valuation ratio as a proxy of Tobin's Q ratio. Therefore, we define the bidder's free cash flow as :

If BVALRT<=1 then BFCFLOW1/2 = BCFLOW1/2,

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[19] These are a combination of equity and cash or debt, cash or equity and cash, debt or equity, equity and debt, cash or debt, equity or debt and cash, cash or equity and debt, equity or equity and cash, equity and cash and debt, equity or cash or debt, and debt.

[20] The construction of this variable is described in appendix 6.1.

Else BFCFLOW1/2=0 (6.4)

To obtain the cash flow measures BFCLOW1/2 we use two definitions of cash flow measures. The first definition is based on operating income (BCFLOW1) and the other, which is more complicated, is based on operating income adjusting for changes in inventories, debtors and creditors (BCFLOW2). Both definitions of cash flows are normalised by the book value of net assets and all these measures are taken from the financial statements at the year end before the bid. Thus, the first definition of cash flow can be given by the formula :

$$BCFLOW1 = \frac{Profit\ After\ Tax + Depre-ciation - Dividends - Minority\ Interest}{Net\ Assets} \quad (6.5)$$

and the second definition by :

$$BCFLOW2 = \frac{CFLOW1 + Change\ in\ Stock + Change\ in\ Debtors + Change\ in\ Creditors}{Net\ Assets} \quad (6.6)$$

Using the above variables we are going to test the hypotheses discussed in section 6.2 and 6.3. The table which follows summarises these hypotheses.

Table 6.1. Expected sign of the relationships described in our hypotheses.

	BIDDERS	TARGETS		COMBINED FIRM
Independent Variable	Dependent Variable			
	WEALTH	WEALTH	MOOD	WEALTH
MOOD	ne0	+		
WEALTH			ne0	
BTOEHOLD	+	-	-	
SINGLE	+	-		
BDIRSHR	ne0	ne0		ne0
BDIRSHR2	ne0	ne0		ne0
TDIRSHR	ne0	ne0	-	ne0
TDIRSHR2	ne0	ne0		ne0
BLRGSHR	ne0	ne0		ne0
TLGRSHR	ne0	ne0	ne0	ne0
TGEART			-	
GEARDIF	+	+		+
BVALRT	+			
TVALRT		-	-	
VALRDIF	+	+		+
INDFIT	+	+	-	+
P2	ne0	ne0	-	ne0
P3	ne0	ne0	ne0	ne0
P4	ne0	ne0	ne0	ne0
P5	ne0	ne0	ne0	ne0
CYCLE	-	+		ne0
LSIZE	+	+	ne0	
BFCFLOW1/2	-	+		ne0

Note : ne0 (not equal to zero) indicates the cases where we do not predict the sign of the relationship.

Table 6.2 Descriptive statistics of the variables used in the sample of 178 bids.

Variable	Mean	Std.Dev.	Min.	Max.
MOOD	0.303	0.461	0.000	1.000
BWEALTH	-0.057	0.247	-1.323	0.782
TWEALTH	0.279	0.325	-0.960	1.681
TRWEALTH	0.015	0.210	-0.989	0.664
BTOEHOLD	3.497	9.95	0.000	63.920
SINGLE	0.786	0.410	0.000	1.000
BDIRSHR	8.464	14.997	0.002	77.070
TDIRSHR	11.600	18.440	0.000	82.280
BLRGSHR	23.080	31.290	0.000	93.300
TLGRSHR	21.100	21.940	0.000	88.000
BGEART	0.490	0.120	0.145	0.768
TGEART	0.480	0.150	0.069	1.540
GEARDIF	0.010	0.190	-0.979	0.456
BVALRT	2.197	1.520	0.288	9.690
TVALRT	1.690	1.430	0.061	12.290
VALRDIF	0.269	0.445	0.000	1.000
INDFIT	0.376	0.480	0.000	1.000
P1	0.061	0.240	0.000	1.000
P2	0.157	0.360	0.000	1.000
P3	0.112	0.310	0.000	1.000
P4	0.382	0.480	0.000	1.000
P5	0.286	0.450	0.000	1.000
CYCLE	0.601	0.490	0.000	1.000
LSIZE	1.634	1.460	-2.210	6.720
BFCFLOW1	0.016	0.040	0.000	0.210
BFCFLOW2	0.014	0.060	-0.251	0.440

6.5 Methodological issues.

6.5.1 The models used.

As we can recall from section 1.3 of chapter 1 our system of simultaneous equations is composed of the following two equations.

$$WEALTH = f\{\underline{X}, MOOD\} \qquad (6.7)$$

$$MOOD = f\{\underline{Y}, WEALTH\} \qquad (6.8)$$

where $\underline{X}$ and $\underline{Y}$ are vectors including the exogenous explanatory variables in the first and second equation respectively.

Both equations can be modelled in multiple regression form. However, while the first equation (6.7) can be estimated by the standard ordinary least squares method, the second equation (6.8) cannot because the dependent variable MOOD is binary. The equation (6.8) can be expressed in the form of a regression model, such as[21] :

$$y^*_i = \alpha + \sum^k_{j=1} \beta_j x_{ij} + u_i \qquad (6.9)$$

where y^*_i (MOOD) is a "latent" variable which is not observed representing the probability that the bid will be hostile or friendly. The observed variable is the dichotomous variable y_i which takes a value of 1 if $y^*>0$ (hostile) and a value of 0 (friendly) otherwise.

What we try to estimate is the probability that y_i will be 1 against the alternative of 0. If P_i is the probability that MOOD=1 then :

$$P_i = F(\alpha + \Sigma^k_{j=1} \beta_j x_{ij}) = F(Z_i) \qquad (6.10)$$

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[21] This section is based on **Maddala (1992)**, pp.327-328.

where $Z_i=\alpha+\Sigma^k_{j=1}\beta_j x_{ij}$ and F is the cumulative distribution of the error term u. The values of y_i follow a binomial distribution and therefore the likelihood function can be expressed as :

$$L=\prod_{y_{i=1}} P_i \prod_{y_{i=0}} (1-P_i) \qquad (6.11)$$

If we assume that the cumulative distribution function (F) of u_i is logistic we obtain the logit model given by :

$$F(Z_i)=\frac{\exp(Z_i)}{1+\exp(Z_i)} \qquad (6.12)$$

and

$$\log\frac{F(Z_i)}{1-F(Z_i)} = Z_i \qquad (6.13)$$

where Z_i is the MOOD equation (eq.6.8). This can also be written as :

$$\log\frac{P_i}{1-P_i} = \alpha + \sum^k_{J=1}\beta_j x_{ij} \qquad (6.14)$$

The left-hand side of equation (6.14) constitutes the **log-odds ratio**, i.e. the ratio of the probability that the event (hostile) will occur to the probability that the event will not occur (friendly). The parameters of 6.14 can be estimated using a maximum likelihood method.

The overall fit of the logit regression model is given by the Log Likelihood Ratio (LRI) which is estimated using the McFadden's ratio. The McFadden's ratio is equal to :

$$McFadden's\ R^2 = 1-\frac{\log L_{UR}}{\log L_R} \qquad (6.15)$$

where L_{UR} is the maximum of the likelihood function when maximised with respect to all the parameters of equation (6.9) and L_R is the maximum when maximised with the restriction $\beta_i=0$ for i=1,2,..,k.

6.5.2 Hausman's test of exogeneity.

The choice of the appropriate estimator which we use to estimate equations (6.7) and (6.8) depends on whether WEALTH and MOOD are statistically endogenous variables. According to **Maddala (1992)**, a variable in a specific equation is considered to be statistically exogenous if it is independent of the contemporaneous and future error terms in that equation.

Hausman (1978) proposed a test of exogeneity. The main idea of the test is to obtain the predicted values of the hypothesised endogenous variables and examine their statistical significance. The variables we want to test for endogeneity are WEALTH and MOOD and in this case the Hausman test consists of three steps.

In the first step, we estimate the reduced form of the WEALTH and MOOD equations using the OLS and logit estimators in order to obtain the predicted values WEALTHF and MOODF respectively.

In the second step, we estimate the **expanded regression** equations of WEALTH and MOOD :

$$WEALTH=\beta_2 MOOD + \alpha_i \underline{X} + \gamma_2 MOODF + u_1 \qquad (6.16)$$

$$MOOD=\beta_1 WEALTH + \alpha_i \underline{Y} + \gamma_1 WEALTHF + u_2 \qquad (6.17)$$

where $\underline{X}$ and $\underline{Y}$ are as given in equations 6.7 and 6.8 respectively and u_1 and u_2 are the error terms.

In the third step we test the statistical significance of γ_1 and γ_2.

If the results we obtain from the Hausman test suggest the endogeneity of variables wealth and mood then we must estimate the equations 6.7 and 6.8 simultaneously. However, in our model one dependent variable is in continuous form (WEALTH) and the other is in binary form (MOOD). In this case we must apply the mixed logit estimator especially designed by **Maddala (1983)** for such a model of simultaneous equations. Due to the fact that we have a mixed model we cannot apply the Two-Stage Least Squares method or the Two-Stage Logit estimator of **Mallar (1977)**.

6.6 Results obtained for target companies.

As we can recall from chapter 5, we examined the creation of takeover gains for bidders, targets and the combined firm separately. We follow the same procedure here attempting to explain these wealth gains starting from target companies[22]. The reason for doing this is because our simultaneous equations approach can only apply in the case of target firms. This is true given the fact that the mood of a bid is influenced, according to the literature reviewed in section 6.3, by some factors which are specific to the target company.

The current section first identifies the determinants of wealth gains of target companies and second highlights the factors influencing the mood of bids. We also investigate here the existence of a possible endogeneity between WEALTH[23] and MOOD using the Hausman test.

Due to the fact that the results from the Hausman test will determine the appropriate estimator required, we decided to test the significance of MOODF at the 1% level. The t-ratios of the coefficients of MOODF obtained are -1.82 and -1.84 in equations (1) and (2) respectively[24] which are not significant at the 1% level. Therefore, we reject the endogeneity of MOOD variable and we apply the logit estimator.

As mentioned above, we also performed a Hausman test in order to test the exogeneity of WEALTH in the MOOD equation. The t-ratios of WEALTHF1 and WEALTHF2 generated by the

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[22] LIMDEP computer programme has been used to generate our regression results for this and the next chapter.

[23] TWEALTH of table 6.2 is used here to reflect the target wealth gains. The same also measure of wealth will be included in the MOOD equation.

[24] We used both definitions of free cash flow, namely BFCFLOW1 and BFCFLOW2, and hence we report the results in table 6.3 for two equations, (1) and (2). The Hausman test was also performed for both equations.

expanded regression model of Hausman test are -0.45 and -0.42. Neither of them is statistically significant and hence we can conclude that the WEALTH variable is also exogenous. Therefore, it is appropriate to use the OLS estimator in order to estimate the determinants of target wealth gains.

6.6.1 Explaining target's wealth gains.

Table 6.3 reports the results obtained by running an OLS regression of all the independent variables on WEALTH. The independent variables are MOOD, BTOEHOLD, SINGLE, BDIRSHR, BDIRSHR2, TDIRSHR, TDIRSHR2, BLRGSHR, TLRGSHR, GEARDIF, TVALRT, VALRDIF, INDFIT, P2,P3,P4,P5, CYCLE, LSIZE, BFCFLOW1 and BFCFLOW2. Two equations giving similar results are generated in table 6.3 depending on the different definition of bidder's free cash flow, i.e. BFCFLOW1 or BFCFLOW2. In all equations the variables which proved to be significant for the creation of wealth gains in target companies are MOOD, BTOEHOLD, BDIRSHR2, TLRGSHR, TVALRT, VALRDIF, P2,P3,P4,P5, CYCLE and LSIZE. First of all, the coefficient of MOOD has the correct positive sign and is significant in all equations even at the 1% level of significance (one tail test). This clearly shows that hostile bids increase the returns of target company shareholders.

BTOEHOLD is another variable with significant explanatory power which is negatively related, as hypothesised, with the wealth gains of target firms. It is significant at the 5% level in eq. (2) and at the 10% level in eq. (1). Thus, the existence of a bidder's pre-merger interest reduces the bid premia captured by target shareholders.

The coefficient of BDIRSHR is positive but insignificant at the 10% level. On the other hand, BDIRSHR2 is significant at the 10% level and is negatively associated with target's wealth gains. This shows that a non-linear form of bidder's directors shareholdings may not satisfactorily explain the

relationship between directors interests in the bidding firm and wealth gains of the target shareholders.

The coefficient of TLRGSHR is significant at the 5% level and hence we can conclude that institutional or any other large shareholdings in the target company (TLRGSHR) decrease the returns of target shareholders. However, bidder's large shareholdings (BLRGSHR) proved to be insignificant in explaining target's wealth gains.

The valuation ratio (TVALRT) of the target company is negatively related with wealth gains and significant at the 5% level (one tail test). This finding confirms our hypothesis that targets with a low valuation ratio make the most of the gains in takeover bids. Furthermore, it seems that larger wealth gains are created when targets with low valuation ratios (<=1) are acquired by bidders with high valuation ratios (>1) because VALRDIF is positively associated with target's wealth gains. VALRDIF is significant at 10% level in equations (1) and (2) (one tail tests).

The mode of payment variables all have positive signs and are significant at the 5% or 1% level. This shows that cash offers generate lower returns than any other type of payment, even when compared with pure equity offers.

The CYCLE variable is significantly positively associated with WEALTH (at the 10% level, one tail test). This finding confirms our hypothesis that target companies make more gains in periods of rising economic activity.

The coefficient of LSIZE is positive and significant at the 5% level in equations (1) and (2). It shows that the shareholders of the target company gain more when their company is relatively small compared to the bidder. This contradicts our hypothesis suggesting that the larger the

bidder the more likely it is that he will overpay.

TDIRSHR, TDIRSHR2, GEARDIF, INDFIT, BFCFLOW1 and BFCFLOW2 proved to be insignificant in explaining wealth gains of target companies, although the signs of the coefficients of INDFIT and GEARDIF are as predicted. The level of managerial interests in the target firm proved to be unimportant in the creation of target's wealth gains. This suggests that we cannot accept the alignment or the entrenchment hypothesis. We also found that contrary to our hypotheses the difference in gearing ratios of bidder and target, industrial fit and bidder's free cash flows cannot explain target's returns.

The overall fit of the regression models is satisfactory giving an R^2-adj. of approximately 22% with an F-statistic of about 3.5 (Prob.=0.0000).

Table 6.3 Determinants of Target's Wealth Gains using OLS multiple regression analysis.

Independent Variable	(1)		(2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	-0.08482	-0.646	-0.09308	-0.717
MOOD	0.13572[a]	2.461	0.13373[a]	2.430
BTOEHOLD	-0.00425[c]	-1.633	-0.00456[b]	-1.833
SINGLE	-0.05556	-0.976	-0.05556	-0.975
BDIRSHR	0.00498	1.154	0.00514	1.190
BDIRSHR2	-0.00009[c]	-1.440	-0.00010[c]	-1.529
BLRGSHR	0.00077	1.083	0.00077	1.077
TDIRSHR	0.00103	0.253	0.00098	0.237
TDIRSHR2	-0.00002	-0.457	-0.00002	-0.440
TLRGSHR	-0.00232[b]	-2.081	-0.00232[b]	-2.073
GEARDIF	0.03151	0.244	0.02911	0.224
TVALRT	-0.03420[b]	-1.798	-0.03201[b]	-1.755
VALRDIF	0.08775[c]	1.386	0.09686[c]	1.633
INDFIT	-0.04097	-0.850	-0.03984	-0.828
P2	0.22836[b]	1.980	0.22599[b]	1.944
P3	0.34526[a]	2.991	0.34418[a]	2.880
P4	0.41050[a]	3.977	0.41091[a]	3.976
P5	0.39582[a]	3.772	0.39575[a]	3.769
CYCLE	0.06437[c]	1.430	0.065881[c]	1.463
LSIZE	0.04316[b]	2.319	0.04280[b]	2.278
BFCFLOW1	-0.29749	-0.469		
BFCFLOW2			-0.08478	-0.237
R^2	31.02%		30.94%	
R^2-adj.	22.23%		22.15%	
F-stat.	3.53		3.51	
Prob.for F.	0.00000		0.00000	

Note : a is significant at the 1% level of significance
b is significant at the 5% level of significance
c is significant at the 10% level of significance.

6.6.2 Explaining the mood of bids.

The variables which we used to explain the mood of bids are WEALTH, BTOEHOLD, TDIRSHR, TLRGSHR, TGEART, TVALRT, INDFIT, P2,P3,P4,P5 and LSIZE. We ran a logit regression of the above variables on MOOD and obtained the coefficients and t-ratios presented in table 6.4. Looking at table 6.4 we can observe that the variables which explain the mood of bids are WEALTH, TDIRSHR, TLRGSHR, TGEART, INDFIT, P2,P3,P4,P5 and LSIZE. The coefficient of the WEALTH variable has a positive sign and is significant at the 1% level. This shows that the probability of hostile bids is higher when the wealth gains offered to target shareholders are also high.

However, it can be argued that in order to accurately predict the mood we should have used the initial bid premium as the correct proxy of wealth gains and not the cumulative abnormal return. As mentioned in section 6.4, WEALTH is expressed as the cumulative average abnormal return over a period of 6 months (3 months before the bid until 2 months after the bid) and as such incorporates the total impact of the takeover bid on target's shareholder wealth including the effect of hostility in higher revised offers. In order to test this argument, we performed again the logit regression of mood using the target's abnormal return in month 0, the announcement month.

Although this measure is not perfect it gives a closer approximation of the initial offer, since we do not have the data about the initial exact value of the offer on day 0 since we use monthly data. However, in the logit regression results obtained (which we do not report here) WEALTH gave a positive coefficient which is significant at the 1% level (t-ratio=2.39). This suggests that the positive relationship between wealth gains and mood still exists even when wealth is measured over a different period of time.

The variable of directors shareholdings confirm the

predicted negative relationship with the mood of bids, as the negative and highly significant coefficient of TDIRSHR shows. Thus, hostile bids are more likely to occur when managerial interests in the target firm are low.

The behaviour of TLRGSHR variable is consistent with the monitoring role hypothesis. The sign of the coefficient is significantly negative at the 10% level showing that large shareholders are associated with friendly bids.

The TGEART variable has a negative sign and is significant at the 10% level (one tail test) confirming the hypothesis that highly geared target companies have a lower probability of receiving a hostile bid.

INDFIT has a positive sign and is significant at the 10% level (two tail test). However, this contradicts our hypothesis because it indicates that related bids have a higher likelihood of being hostile than unrelated bids.

The negative signs of P2,P3,P4,P5 which, except for P3, are significant show that offers which are not financed by cash are associated with friendly bids. As expected, all equity offers are significantly and negatively related to hostile bids at the 1% level.

Finally, LSIZE is negatively associated with hostile bids and highly significant (at 1% level) which demonstrates that the larger the bidder relative to the target the less likely it is that the target's management will resist the bid.

The overall fit of our logit regression model is given by the Log Likelihood Ratio (LRI) which is 25.29%. The chi-square statistic of 52.255 (Pr.of x^2=0.54ϵ-08) suggests that this value is highly significant.

Table 6.4 Determinants of Mood using Logit multiple regression analysis.		
Independent Variable	(1&2)	
	Coef.	t-stat.
Constant	2.67580[b]	2.052
WEALTH	1.83056[a]	2.500
BTOEHOLD	-0.00891	-0.427
TDIRSHR	-0.09521[a]	-3.265
TLRGSHR	-0.01314[c]	-1.360
TGEART	-2.39370[c]	-1.536
TVALRT	0.08553	0.420
INDFIT	0.61617[c]	1.432
P2	-3.05606[a]	-2.627
P3	-0.50906	-0.493
P4	-2.06202[b]	-2.086
P5	-1.69071[b]	-1.721
LSIZE	-0.421951[a]	-2.398
LRI	25.29%	
X^2	55.255	
Prob.for X^2	0.00000	

Note :a is significant at the 1% level of significance
b is significant at the 5% level of significance
c is significant at the 10% level of significance.

6.7 Results obtained for bidders.

The final model we constructed to explain the wealth gains captured by bidders[25] includes all the variables discussed in section 6.2. These variables are MOOD, BTOEHOLD, SINGLE, BDIRSHR, BDIRSHR2, TDIRSHR, TDIRSHR2, BLRGSHR, TLRGSHR, GEARDIF, BVALRT, VALRDIF, P2,P3,P4,P5, INDFIT, LSIZE, BFCFLOW1/2[26] and CYCLE. Both equations are estimated by OLS and give more or less similar results. Table 6.5 presents the coefficients, t-ratios and measures of fit for our equations.

Looking at both equations we can see that the variables which are statistically significant are MOOD, SINGLE, BDIRSHR2, TDIRSHR2, GEARDIF and BVALRT. The positive sign of the coefficient of MOOD variable, which is statistically significant at the 5% level (two tail test), shows that hostile bids increase the wealth gains of bidder shareholders.

The absence of rival bidders increases the bidder's abnormal returns as expected. The coefficients of SINGLE obtained in equations (1) and (2) accordingly are positive and statistically significant at the 5% level (one tail test). Thus, bidder shareholders are better off in single bids.

While directors interests are insignificant in the linear form BDIRSHR, they become significantly negative in the squared form BDIRSHR2 with t-ratios of -1.97 and -2.01 in equations (1) and (2) respectively. Thus, our assumption about a non-linear relationship between directors interests and wealth gains has not been confirmed. Similarly, TDIRSHR is insignificant in both equations and TDIRSHR2 is positive and significantly related to bidder's wealth. As a result of

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[25] BWEALTH of table 6.2 is used here to reflect the bidder wealth gains.

[26] Two equations are presented using two different definitions of cash flows.

that our confidence in a non-linear relationship between target directors shareholdings and bidder wealth gains is also limited.

Another factor which seems to explain a part of the bidder's returns is the difference in the gearing ratio between the bidding and target firms. GEARDIF is significantly and positively related at the 10% level of significance in both equations suggesting that the existence of financial synergies is a possible source of bidder's gains.

Nevertheless, the most significant variable in explaining bidder gains is the bidder's valuation ratio. The coefficient of BVALRT is negative and significant at the 1% level (two tail test) suggesting that bidders with a high valuation ratio obtain lower wealth gains. This in turn suggests that bidders who are highly valued by the market for the quality of management are more likely to overpay in takeovers because of hubris.

Looking again at the table 6.5 we can see that the other variables VALRDIF, BTOEHOLD, BLRGSHR, TLRGSHR, INDFIT, P2,P3,P4,P5, CYCLE, LSIZE and BFCFLOW1, BFCFLOW2 are not statistically significant. For example, VALRDIF has the predicted positive sign but is not statistically significant and the same also applies for the negative but insignificant coefficient of BTOEHOLD. It seems also that different definitions of bidder's free cash flow cannot explain bidder's wealth gains and does not affect our overall results. Furthermore, the fact that CYCLE is insignificant in explaining bidders returns contradicts our hypothesis that bidders tend to overpay to acquire their targets during a boom period of economic activity.

Finally, the overall fit of the OLS regression models we used is rather poor. In the first equation the R^2-adjusted is 9.01% while in the second equation it is 9.2%. However, the

fact that the F-statistic is 1.87 (Prob.=0.017) in the first equation and 1.89 (Prob.=0.015) confirms the overall statistical significance of our results. We recognise that our models have an overall low degree of explanatory power possibly due to the high level of bidder's abnormal returns clustered around the mean of the distribution. However, it is not unusual in the existing literature[27] attempting to explain bidder's wealth gains to obtain such low explanatory power.

[27] For example, **Lang, Stulz & Walkling (1989)** reported an R^2 of 3.38%.

Table 6.5 Determinants of Bidder's Wealth Gains using OLS multiple regression analysis.

Independent Variable	(1)		(2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	-0.03952	-0.365	-0.01877	-0.176
MOOD	0.07566[b]	1.677	0.07524[b]	1.669
BTOEHOLD	-0.00194	-0.913	-0.00133	-0.643
SINGLE	0.08482[b]	1.806	0.08425[b]	1.796
BDIRSHR	0.00369	0.998	0.00408	1.103
BDIRSHR2	-0.00011[b]	-1.972	-0.00011[b]	-2.019
BLRGSHR	-0.00058	0.983	0.00062	1.049
TDIRSHR	-0.00354	-1.056	-0.00315	-0.933
TDIRSHR2	0.00007[c]	1.449	0.00006[c]	1.332
TLRGSHR	-0.00006	-0.072	-0.00013	-0.142
GEARDIF	0.16377[c]	1.566	0.16175[c]	1.547
BVALRT	-0.04947[a]	-3.493	-0.05351[a]	-3.949
VALRDIF	0.04526	0.995	0.03489	0.794
INDFIT	0.00008	0.002	-0.00129	-0.033
P2	0.02042	0.214	0.01101	0.115
P3	-0.06761	-0.687	-0.06556	-0.667
P4	-0.00536	-0.063	-0.01103	-0.130
P5	-0.04916	-0.568	-0.04883	-0.565
CYCLE	0.02044	0.550	0.02062	0.556
LSIZE	-0.00367	-0.238	-0.00515	-0.332
BFCFLOW1	0.29792	0.569		
BFCFLOW2			-0.23703	-0.807
R^2	19.29%		19.46%	
R^2-adj.	9.01%		9.20%	
F-stat.	1.87		1.89	
Prob.for F.	0.017		0.015	

Note :a is significant at the 1% level of significance
b is significant at the 5% level of significance
c is significant at the 10% level of significance.

6.8 Results obtained for the combined firm.

To explain the combined firm's returns[28] we decided to include mainly the agency and financial synergies variables as well as those variables that affect the creation of gains but do not affect the division of gains between the bidder and target. Therefore, we should exclude variables such as SINGLE, BTOEHOLD, BVALRT, TVALRT and LSIZE because their impact on the wealth gains is different between the bidders and targets.

In the group of variables which do not influence the division of wealth gains we could include MOOD since we found that the market rewards both bidders and targets in hostile bids in the anticipation of expected managerial efficiencies. However, MOOD also reflects other factors such as the degree of competition which should be excluded. Furthermore, since we have the VALRDIF variable which constitutes a better proxy of managerial synergies we consider that we should drop the MOOD variable from this equation.

Thus, the final model contains BDIRSHR, BDIRSHR2, TDIRSHR, TDIRSHR2, BLRGSHR, TLRGSHR, GEARDIF, VALRDIF, INDFIT, P2,P3,P4,P5, CYCLE, BFCFLOW1/2. This produces two equations, one with BFCFLOW1 and one with BFCFLOW2, which are presented in table 6.6.

Interpreting the positive and significant sign (at 5% level) of BDIRSHR and the negative and significant sign (at 1% level) of BDIRSHR2 we can see that bidder's directors interests at low levels seem to increase the total returns while at high levels they have the opposite effect. Thus, the behaviour of directors interests examined in a non-linear form shows that managers with high shareholdings tend to make larger losses for their companies in takeovers.

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[28] TRWEALTH of table 6.2 is used here to reflect the combined firm's wealth gains.

The target's directors interests variable (TDIRSHR) becomes significant at the 10% level taking a negative sign and then becomes insignificant with a positive sign in the squared form (TDIRSHR2). This result leads us to the conclusion that a non-linear relationship between directors interests in the target company and combined firm returns does not exist.

The negative and significant coefficient (at the 10% level) of TLRGSHR demonstrates that large shareholdings in the target company decrease the total returns probably because of the monitoring role of large shareholders. BLRGSHR has a positive sign but is insignificant.

Financial and managerial synergies seem to be two important sources of the gains of the combined firm. This is clearly reflected in the positive coefficient of GEARDIF which is significant at the 5% level and the positive coefficient of VALRDIF which is significant at the 10% level. Another source of total gains may be found in the positive impact of growing economic activity. The CYCLE variable has a positive sign which is significant at the 5% level suggesting that in a period of growing economic activity both bidding and target companies make higher gains than in a recession period.

Finally, INDFIT, the mode of payment variables (except P4) and the bidder's free cash flows variables proved to be insignificant in explaining the wealth gains of combined firms.

The overall fit of the two OLS regression models is rather low giving an R^2-adj. which is close to 4% and an F-statistic of 1.5 which is significant at the 10% level.

Table 6.6 Determinants of the Combined Firm's Wealth Gains using OLS multiple regression analysis.

Independent Variable	(1)		(2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	-0.07911	-1.032	-0.06577	-0.869
BDIRSHR	0.00517[b]	1.806	0.00522[b]	1.805
BDIRSHR2	-0.00011[a]	-2.462	-0.00011[a]	-2.391
TDIRSHR	-0.00399[c]	-1.513	-0.00385[c]	-1.444
TDIRSHR2	0.00004	1.108	0.00004	1.017
BLRGSHR	0.00046	0.909	0.00047	0.917
TLRGSHR	-0.00096[c]	-1.301	-0.00092[c]	-1.248
GEARDIF	0.16219[b]	1.881	0.16924[b]	1.967
VALRDIF	0.05901[c]	1.545	0.04846[c]	1.303
INDFIT	-0.28528	-0.860	-0.03057	-0.920
P2	0.06998	0.901	0.06222	0.796
P3	0.04630	0.560	0.05016	0.606
P4	0.09321[c]	1.320	0.08595	1.219
P5	0.07241	0.995	0.06951	0.954
CYCLE	0.05511[b]	1.711	0.05392[b]	1.670
BFCFLOW1	0.37313	0.915		
BFCFLOW2			-0.04795	-0.195
R^2	12.46%		12.03%	
R^2-adj.	4.36%		3.88%	
F-stat.	1.53		1.47	
Prob. for F.	0.0973		0.1190	

Note: a is significant at the 1% level of significance
b is significant at the 5% level of significance
c is significant at the 10% level of significance.

6.9 Discussion of our results.

In this section we discuss and summarise the main findings presented in the three previous sections offering an interesting insight into the issue of what determines the wealth gains and the mood of takeover bids. First of all, using a simultaneous equations approach we confirmed the mutual dependence of wealth and mood. Thus, we found that hostile bids are more likely to occur when the bid premium offered is high and that hostile bids further increase the wealth gains of target shareholders.

The finding that the managers of target companies are more likely to resist bids which offer higher wealth gains to their shareholders is basically against the argument of **Baron (1983)**, but is in line with **Morck, et.al. (1988a)** who are in favour of higher wealth effects of disciplinary bids and the managers preference for control. Managers who have been non-value maximisers and have a strong preference for control are more likely to reject bids which lead to their replacement. However, these bids are also likely to offer higher wealth gains to target shareholders in anticipation of correcting managerial failure.

Our evidence of a positive relationship between wealth and the probability that the mood will be hostile contradicts the study of **Long & Walkling (1984)** who found that the wealth offered to target shareholders does not affect the mood. However, Walkling in the above study used a different definition of wealth gains[29] and it is possible that his results are different from ours because of this. We shall pursue this issue further in the next chapter.

We also discovered that hostile bids increase the wealth gains of target companies, something that was recognised by

[29] Bid premium was defined in the study of Walkling as the pecentage difference of the share price before and after the bid.

Walkling (1985) and **Varayia (1987)**. This is likely to occur mainly for two reasons. The first is that the resistance of the target company's management causes the bidder to increase the bid premiun in order to make the managers recommend the bid or lure the target shareholders to sell their shares. The second reason is that the hostile bid signals to other bidders the possibility that profits can be made. For example, the market may believe that the target company has been undervalued due to inefficient managers and expects that their replacement will develop the full potential of the target leading to higher profits. If the rival bidders also anticipate this, they will bid higher and the resulting auctioneering process will increase the final premium paid to target shareholders.

Another important finding of our research is the fact that hostile bids also increase the wealth gains of bidding firms, something that contradicts the previous empirical evidence and makes our results particularly interesting. For example, **Franks & Harris (1989)** and **Limack (1990)** found that bidders tend to overpay in hostile bids either due to hubris or the increased degree of competition and that hostile bids result in a transfer of wealth from bidders to targets.

We consider that this can be explained under the argument of the disciplinary role of hostile bids [**Morck, et.al. (1988a)**]. Hostile bids, if successful, will lead to the replacement of the incumbent management in the target firm and as a result of this it is expected that managerial efficiencies will increase. Therefore, the mood here reflects the expected managerial synergies which are likely to arise from the solution given to the agency problem. Under this scenario higher wealth gains to bidders in hostile bids are justified.

A third finding of our study is that wealth gains are explained by both long and short-run factors. The long-run

strategic factors are the financial synergies and managerial efficiencies while the short-run factors are the mood of the bid, number of rival bidders and mode of payment. However, we failed to find evidence in support of the operating synergies argument since the industrial relatedness variable (INDFIT) proved to be statistically insignificant in the wealth equations of bidding, target and combined firms.

On the other hand, financial synergies have a positive effect, as expected, in the bidding and combined firms returns. Thus, a difference in the gearing ratios of the merging firms which implies a latent debt capacity of the target firm helps to explain the higher wealth gains of the bidding company and the combined firm. However, GEARDIF is not significant in the target's wealth equation. This is not in keeping with the work of **Slusky & Caves (1991)** who reported a positive relationship. As mentioned above, one of the long-run factors influencing the wealth gains created in completed takeover bids is managerial synergies. If we want to be more precise we could say that the expectation of reaping managerial synergies has a positive effect on the combined firms returns. To understand this, we have to look at the behaviour of the VALRDIF variable.

The positive and statistically significant sign of VALRDIF in the targets and combined firms equations shows that higher wealth gains arise when low valued targets are taken over by highly valued bidders. If we accept that the valuation ratio is a proxy for management efficiency and investment opportunities then our findings suggest that the market evaluates positively the prospect that firms with superior management and investment opportunities acquire firms with underutilised assets due to poor management. Thus, our results resemble the findings of **Lang, et.al. (1989)** who reported that when high Q bidders take over low Q targets the wealth gains increase. However, the results of Lang, et.al. differ from ours since they found a positive

effect on bidders returns as well as targets returns.

Our hypotheses regarding the relationship between the bidder's toehold and the presence of rival bidders on the one hand and wealth gains on the other hand have been partially confirmed. We say partially confirmed because while BTOEHOLD was found to significantly reduce target wealth gains as hypothesised, it was not found to have any significant impact on bidder returns. Also while SINGLE was significantly and positively related to bidder's wealth gains it proved to be insignificant for target wealth gains.

One finding of our study which differentiates our results from those of other studies such as **Huang & Walkling (1987)** and **Franks, Harris & Mayer (1988)** is the fact that cash offers generate lower returns for target shareholders than equity offers and any other form of payment. This finding is consistent with the uncertainty argument. In other words, it is possible that equity offers may cause higher gains to target shareholders due to the fact that the bidder may increase the bid premium in order to compensate the target shareholders for bearing the uncertainty associated with equity payment. However, we have to say that our confidence in this conclusion is affected by the fact that we have a very small number of cash offers in our sample. Out of 178 bids we have only 11 cash offers compared with 28 equity offers, 20 cash and equity bids, 68 cash or equity offers and 51 other type of offers.

It was also found that the mode of payment did not have any significant impact on the wealth gains of bidding and combined firms. This is again in conflict with the findings of previous empirical studies [e.g. **Travlos (1987)**].

Other factors which influence the creation of wealth gains are the valuation ratios of bidder and target company, the relative size of bidder to target and the business cycles.

First, we found that firms with a low valuation ratio in the pre-bid period obtain higher wealth gains which suggests the existence of information asymmetries. This is because, the bidder might have private information prior to the bid showing that the value of these target companies could have been higher than the current one if the incumbent mangement was replaced. When the bid is announced this information is released to the market which re-evaluates upwards the share prices of these companies. Thus, companies with a low value prior to the bid due to inefficient management have a potential for higher wealth gains. The fact that firms with low valuation ratios obtain higher bid premia was also reported by **Walkling & Edmister (1985).**

Furthermore, target's wealth gains are positively associated with CYCLE and LSIZE suggesting that target companies experience higher gains in periods of rising economic activity and when the bidder is relatively larger than the target. The CYCLE variable has a positive effect on targets returns as hypothesised but does not have any effect on bidders returns. Moreover, CYCLE has a positive effect on the combined firm's returns. This suggests that both the target and the combined firm make more gains in a period of economic boom and this, contrary to our hypothesis, suggests that there is no transfer of wealth from the bidder to the target firm.

The fact that the target company makes more gains when the bidder has a larger market value suggests the possibility of bidder's overpayment. Although the bidder's overpayment is not directly shown in the equation of bidder wealth gains because bidder's returns are indifferent to relative size, it can be detected by looking at the negative relationship between the bidder's valuation ratio and his wealth gains. As we argued in section 6.7, large bidding firms are more likely to overpay, because managers of these companies who have been valued prior to the bid at a high level by the

market for their quality skills are more prone to hubris effects.

Another issue examined in our study is the agency problem and its effect on the creation of wealth gains and the mood of bids. The variables of directors and large shareholders interests were taken as proxies for agency costs.

Examining first the behaviour of directors interests in the target firm we can observe that in the equation of target wealth gains directors shareholdings do not influence the creation of wealth suggesting that the agency problem does not exist. Also, in the equation of bidder wealth gains it was shown that a non-linear relationship between bidder wealth gains and directors interests in target and bidder companies does not exist. The same applies in the case of bidder directors interests in the equation of target's wealth gains and in the case of target directors interests in the equation of combined firm returns. These results give an unstable pattern which makes overall interpretation difficult and hence we cannot satisfactorily argue in favour of the alignment or entrenchment hypothesis.

However, our results suggest that the agency problem exists in the target firms and to pursue this further we have to look at the negative relationship between target directors shareholdings and the mood of bids. This relationship suggests that a low level of managerial ownership increases the probability that the bid will be hostile. This can be explained by the argument of **Morck, et.al. (1988a,b)** about disciplinary bids who showed that non-value maximising managers are more likely to hold a low fraction of their companies stock. In this case the agency problem is more likely to arise and the value of the firm to fall. As a result, the probability that the target firm will receive a bid designed to replace the inefficient managers will be enhanced. However, this bid is more likely to find

resistance from the incumbent management and hence it will be hostile.

Although, we confirmed the negative relationship between mood and managerial interests we did not find any evidence of a similar relationship between the valuation ratio and the mood. However, we believe that this may be specific to our sample here and we return to this point in the next chapter.

Finally, we discovered that the existence of large shareholdings in the target firm limits the degree of the agency problem. Thus, large shareholders increase the probability that the bid will be friendly and have a negative impact on the size of wealth offered to target shareholders. Both findings are consistent with the monitoring role hypothesis of **Shleifer & Vishny (1986).**

In the case of bidder directors shareholdings there is a more clear and stable pattern in the equation of combined firm because both BDIRSHR and BDIRSHR2 are significant with the first being positive and the second negative. This suggests that bidding companies with a high level of managerial ownership are more likely to suffer wealth decreases in acquisitions. This finding is in conflict with **Lewellen, et.al. (1985)** who found that high levels of directors shareholdings encourage managers to align their interests with the other shareholders. However, we discovered that the lower returns experienced by these bidding firms do not result in higher wealth gains for target shareholders.

A final issue in our discussion will be to highlight the factors which influence the mood of bids. The first factor is the level of managerial ownership in the way described above. The second is the leverage of the target company. As we had hypothesised the higher is the gearing ratio of the

target firm the lower the likelihood that the bid will be hostile. There are two reasons which can explain this relationship. The first is based on the argument of **Stulz (1988)** that a highly leveraged target company is less likely to receive a hostile bid due to certain covenants attached to its debt which reduce its post-merger value and may limit the freedom of the new management team. Under these circumstances, the bidder's willingness to initiate a bid which is likely to receive a hostile response will be limited.

The second reason for a negative relationship between the target's gearing ratio and the probability that the bid will be hostile arises from the fact that a highly leveraged target may signal that the company is in financial distress and hence it will be difficult to convince the shareholders to hold their shares. Furthermore, the management of the target may find it difficult to raise finance in order to mount a successful defense.

A third determinant of the mood of bids is the industrial relatedness. One interesting and unusual finding of our study is that related bids increase the probability that a bid will be hostile. An argument proposed by **Walkling & Long (1984)** to justify this prospect is that the target's management may resist the bid if it fears that an horizontal merger will raise problems of antitrust legislation and in so doing increase the risk of cancellation. In the UK this applies if the bid is referred to the Monopolies and Mergers Commission. Alternatively, it could also be argued than in horizontal mergers target managers will be superfluous after the merger and are therefore likely to lose their jobs while in unrelated mergers the target managers are more likely to have expertise which is necessary in the post-merger period. Horizontal mergers are therefore more likely to be opposed by target managers than unrelated mergers.

It also seems from our results that there is a negative association between P2 and hostile bids. The same also applies to P4 and P5. This indicates that pure equity offers, offers containing an equity alternative and any other type of offers are more likely to be related to friendly bids than pure cash offers. This can be explained by the fact that managers of target companies prefer equity offers rather than cash because they give higher returns. Thus, the observation of **Travlos (1987)** that US hostile bids are likely to be pure cash offers is also confirmed by UK data. Alternatively, one could simply argue that the valuation risk problems that equity entails encourages managers of target companies to recommend such a bid because, if the bid is friendly then both merging firms are likely to exchange information about the value of their companies thereby minimising the valuation risk and uncertainty problems associated with equity offers.

Finally, we discovered that the larger the bidder the lower is the probability that the bid will be hostile.

6.10 Summary and Conclusions.

The main objective of this chapter was to identify the factors determining the creation and division of takeover gains among bidders, targets and the combined firms. Another goal was to investigate the factors that determine whether a bid will be hostile or friendly.

As regards to the first objective of this chapter, we can conclude that both long and short-run factors help to explain the wealth gains in takeover bids. We found evidence supporting the argument that wealth gains created in takeover bids reflect some synergistic benefits which are expected to arise in the long-run from the combination of two firms. However, these expected synergies are likely to be financial and managerial rather than operational. Thus, factors such as increased debt capacity of the combined firm in the post-merger period and the replacement of inefficient management in the acquired firm proved to be more important in explaining takeover gains than economies of scale and other synergies achieved at an operational level.

The most important short-run factor for the creation of wealth gains proved to be the mood of bids. We saw that hostile bids create higher wealth gains for both acquiring and acquired firms because they constitute the means that the market uses to solve the agency problem in badly managed target companies. The market views hostile bids as the mechanism which creates a potential for managerial efficiencies. This is consistent with the disciplinary role of hostile bids and the market for corporate control hypothesis.

Other short-run factors that influence positively the target companies wealth gains are the mode of payment and the existence of multiple bidders which makes the final bidder overpay thereby reducing his gains. The mode of payment explained a significant part of the target's wealth gains

suggesting that equity and mixed type of offers outperform pure cash offers.

From the other factors examined, we found that target companies with low valuation ratios make higher gains while bidding companies with high valuation ratios suffer heavier losses. The former indicates the existence of information assymetries whereas the latter suggests the existence of the hubris effect.

A high level of directors shareholdings in the bidding firms has a negative effect on their wealth gains suggesting that the agency problem in these firms exists. However, we cannot conclude the same for target firms since the directors interests variable was insignificant in the equation of target wealth gains.

The existence of a bidder's toehold was also discovered to have a negative impact on the target wealth gains. Furthermore, it was established that a large size of the bidder relative to target benefits the target shareholders but harms the bidder shareholders due to the hubris effect. Finally, it was found that the growth in economic activity increases the gains of target shareholders but does not have any impact on the gains of bidder shareholders.

The second objective of this chapter was to find what determines whether a bid will be hostile or friendly. The most significant factor was discovered to be the level of managerial ownership in the target company. It was found that low levels of directors shareholdings increase the likelihood that the bid will be hostile. This suggests, as explained in the previous section, that the agency problem may also exist in the target firms and we have been able to detect this by using a simultaneous equations approach. Moreover, we found that large shareholders mitigate the agency problem in the target firms by monitoring the

performance of managers in the pre-bid period.

We also found that the probability of hostile bids is higher when the wealth gains offered to target shareholders are high. This is consistent with the value decreasing behaviour of managers in the target firms who tend to resist bids that create higher wealth gains but lead to their replacement. This finding shows once again the existence of the agency problem in target firms and confirms the mutual dependence between wealth gains and mood of bids.

On the other hand, the factors that increase the probability that the bid will be friendly were found to be the gearing ratio of the target firm, equity and mixed forms of payment, the size of bidder and the existence of large shareholdings in the target company. Finally, it was found that industrial relatedness was positively related with hostile bids and the value of the firm was not important in determining the mood.

Appendix 6.1

The construction of the CYCLE variable.

The variable **CYCLE** was constructed to reflect business activity in the UK economy during the period 1963-1989. We used the **composite coincident indicator** for the period 1958-1992 estimated by the Central Statistical Office (CSO) as a proxy for the cyclical variations of the economy. Before 1976 the composite coincident indicator incorporated 6 indicators : GDP based on expenditure and output, Real Disposable Income (RPDI), manufacturing production, retail sales volume and unfilled vacancies. In 1976 the CSO changed the RPDI to GDP based on income and the unfilled vacancies to the proportion of companies which reported below working capacity in the CBI Industrial Trends Survey. Later other changes were introduced, so that in 1992 the coincident indicator was composed of GDP based on factor cost, the output of industrial production, the proportion of firms below capacity, the index of the volume of retail sales, and the percentage of change in stocks of materials from the CBI survey. We should mention at this point, that the CSO follows a procedure called "amplitude standardisation" in order to bring all component parts of the indicator into a similar scale of measurement. Thus, a composite index is an average of the amplitude standardised parts.

Growth cycles are defined by the CSO as cyclical movements in the deviations from the long term trend. Therefore, the CSO provides the trend eliminated series of the components of the coincident indicator by subtracting from the original series an estimate of the long term trend.

Thus, we identified the business cycles based on two sources of data, the actual values of the CSO composite coincident indicator measured at an index level (taken from Datastream) and the graphs made by the **CSO (1976, 1993)** of the composite coincident indicator. Using these graphs the CSO defines the peaks and troughs in the cycles of the economy. Based on

these peaks and troughs and the actual values of the index, we identified the periods of upward (boom) and downward (recession) drifts in the UK economy between 1958 and 1992 and then classified each bid from our sample into the corresponding cycle. Thus, we define CYCLE as a dummy variable that equals 1 for a boom period, 0 otherwise. It was found that boom and recession periods were defined as follows :

BOOM

12/58-09/60, 11/62-12/65, 03/67-05/69, 11/71-07/73, 09/75-05/79,
03/81-01/84 and 02/86-01/89.

RECESSION

10/60-10/62, 01/65-02/67, 06/69-10/71, 08/73-08/75, 06/79-02/81, 02/84-01/86 and 02/89-02/93.

CHAPTER 7

EXPLAINING THE OUTCOME OF A BID

7.1 Introduction

This chapter attempts to identify the factors determining the success or failure of a bid. Previous US empirical research has shown that the outcome of a bid depends on its mood and the level of bid premium. Thus, **Hoffmeister & Dyl (1981)** found that the resistance of the target's management decreases the probability of a successful takeover bid. **Walkling (1985)** also discovered that the size of bid premium offered to target shareholders is positively related to the probability of success.

However, as explained in the previous chapter the mood of a bid and the target's wealth gains are mutually dependent and therefore we consider that we should examine simultaneously the determinants of outcome, wealth gains and mood of bids[1]. In this way we shall be able to detect the interrelationship among mood, wealth and outcome and a number of other direct and indirect relationships that exist among these variables. The outcome and mood are determined by target companies characteristics, as previous empirical research showed, and since our primary concern here is the prediction of outcome of bids we deal only with target firms.

It should also be mentioned that we perform the above analysis using two definitions of wealth gains in order to test if results are sensitive to the way we define wealth.

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[1] To the best of our knowledge there is no UK published study that investigated the determinants of the outcome of a bid using logit regression analysis and a simultaneous equations framework.

One definition is based on the abnormal returns measure estimated by event study methodology and the other is based on a bid premium framework. We deal with this issue more thoroughly in section 7.3.1.

To predict the outcome of a bid we had to include failed as well as completed bids in our analysis. Thus, our sample is composed of 178 completed and 60 failed bids resulting in a total of 238 bids. The 178 completed bids are the same one used in our analysis in chapter 6. As we shall see from the analysis that follows in sections 7.5 and 7.6 of the current chapter the results obtained with respect to the wealth gains, and mood of bids are not markedly different from those reported in the previous chapter. However, the explanatory power of our regression models for wealth gains and mood equations is lower than that obtained in the sample of completed bids in the previous chapter. Furthermore, some results concerning the mode of payment and valuation ratio variables obtained in this chapter are different from those obtained in chapter 6. Results for some variables, as we shall see, are also sensitive to the definition of wealth gains.

The section which follows reviews the main theoretical and empirical studies which attempted to identify the factors affecting the outcome of bids and subsequently sets our hypotheses. The third section describes our database and highlights some methodological issues such as the Hausman test of exogeneity in the case of three endogenous variables. The fourth, fifth and sixth sections discuss the results obtained regarding the outcome, wealth and mood accordingly whereas the seventh section develops a discussion of our results comparing them with the findings of previous empirical research. Finally, the last section summarises our findings and draws some conclusions.

7.2 Review of the literature and our hypotheses.

We can remind the reader that the review of the relevant studies examining the wealth gains and mood of bids as well as the description of our hypotheses with respect to these factors has been made in sections 6.2 and 6.3 of the previous chapter. The same hypotheses apply in the current chapter regarding the wealth and mood and therefore we do not consider it necessary to repeat them here. However, in this section we shall present the theoretical background and the main findings of previous research regarding the determinants of the outcome of bids and we shall set our hypotheses.

The literature in this area identified a number of variables explaining the probability of success of a takeover bid. These variables include the mood of the bid, target wealth gains (bid premium), bidder's toehold, the number of competing bidders, managerial and large shareholders ownership interests of the target company, the capital structure of the target firm, the mode of payment and the relative size of the target to bidder. We also aim to test the impact of two other variables, namely the industrial fit and the valuation ratio, on the probability of a successful outcome.

Mood of a bid.

According to financial theory, the final decision of the bidder is taken on the basis of the ex-post value of the combined firm and if the cost of defeating the resistance[2] of the management of the target firm is higher than the expected value created from the merger then the bidder will prefer to withdraw. This argument was empirically confirmed in the studies of **Hoffmeister & Dyl (1981)** and **Walkling (1985)**. They found that the degree of resistance of the

[2] The managers of the target company can take various defensive actions such as those described in section 1.2 of chapter 1.

target management which is determined by the mood of a bid was negatively related to the probability of a successful takeover.

Therefore, we also hypothesise that a hostile bid should reduce the probability of a successful takeover.

Target's wealth gains.

Under economic theory it is anticipated that the supply of the target's shares will increase with a higher bid premium[3] and consequently this will increase the likelihood of a successful outcome. However, **Hoffmeister & Dyl (1981)** using multiple discriminant analysis did not detect any impact of the size of bid premium on the outcome of tender offers.

However, **Walkling (1985)** argued that Hoffmeister & Dyl (1981) were wrong to use a linear regression technique such as discriminant analysis when the dependent variable (outcome) is dichotomous. As Walkling pointed out, when the dependent variable does not follow a normal distribution the discriminant function can violate the (0/1) restriction and affect the predicted probabilities. It is also possible that heteroskedasticity will arise. Under these circumstances, Walkling argued that the use of a logistic regression model is more appropriate. By doing that he found a positive relationship between a successful takeover and bid premium.

Based on Walkling's argument and findings, we also assume that the likelihood of a successful outcome will increase when the target shareholders obtain higher wealth gains.

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[3] In the studies of **Hoffmeister & Dyl (1981)** and **Walkling (1985)** the target's wealth gains were expressed in the form of bid premium, in other words as the percentage difference between the value of the offer per share and the market value of the share.

Bidder's toehold.

Shleifer & Vishny (1986) constructed a theoretical model which explains how the bidder's toehold (or in general any large shareholding) can effectively reduce the bid premium demanded, the resistance of target management and consequently increase the probability of the acquisition. The validity of this theoretical model had been predicated earlier by **Walkling (1985)** who showed a positive relationship between the successful outcome of a bid and the bidder's toehold. We also assume that the bidder's toehold will be positively linked with a higher probability of a successful takeover bid.

Rival bidders.

Walkling (1985) argued and empirically showed that the existence of a multiple bidder negatively affects the likelihood of acquisition because the higher number of shares demanded (combined demand of two or more bidders) for a given supply of existing shares will make it more difficult for each bidder to obtain effective control of the target company.

However, it can also be argued that the competition among bidders may lead to a higher premium which in turn will increase the probability of a takeover. Therefore, we hypothesise that the presence of multiple bidders increases the likelihood of success.

Managerial and other large shareholdings.

As we can recall from section 6.2 of the previous chapter, **Stulz (1988)** developed a model which links managerial interests with the level of wealth gains, the mood and the outcome of a bid. The model predicts that when the number of shares that the managers hold equals the number of votes they possess and the mood of the bid is hostile then managers can simply use their voting rights to entrench themselves and block the acquisition. This has the mixed

effect of increasing the size of bid premium obtained while at the same time reducing the probability of a successful outcome because it increases the proportion of shares to be acquired from atomistic or institutional shareholders in order to obtain effective control.

However, according to the alignment hypothesis of **Jensen & Meckling (1976)** if directors align their interests with those of other shareholders then the probability of a successful takeover will increase.

The final decision of managers about recommending the offer is taken on the basis of a trade-off between the size of their current total remuneration (salary, bonuses and other perquisites) and the gains made by selling their shares to the bidder such as the bid premia obtained, the promise to remain in the management of the acquired company in the post-merger period, etc. Thus, if managers decide that the gains from selling their holdings are higher than those obtained by remaining in control they will align their interests with the other shareholders and will sell their shares; otherwise they are more likely to entrench themselves and resist the takeover.

The empirical evidence regarding the relationship between managerial ownership and success of bids is mixed. Thus, **Morck, et.al. (1988a)** found that managerial shareholdings were insignificantly lower in target companies acquired in hostile takeovers, while **Mikkelson & Partch (1989)** and **Song & Walkling (1993)** discovered a positive relationship between directors shareholdings and the probability of a successful outcome of a bid.

In the light of the above theoretical and empirical evidence, we leave open the expected sign of the relationship between managerial shareholdings and the probability of a successful bid. However, we also examine

the above relationship using a non-linear form (TDIRSHR, TDIRSHR2) as Stulz (1988) suggested.

As explained in the previous chapter, if large shareholders have effectively performed their monitoring role of the target management in the pre-bid period [**Shleifer & Vishny (1986)**] then the target company is more likely to receive synergistic bids. As as result of that, managers will be more inclined to recommend these bids and hence the probability of success will be higher. Furthermore, due to the fact that institutional shareholders have lower tax obligations, it is expected that large shareholders, individuals or institutions, will be more willing than directors to sell their shares and ensure the successful outcome of a bid.

As we can recall from section 6.2 of the previous chapter, the empirical evidence is mixed regarding the monitoring role hypothesis. **Stulz, Walkling & Song (1990)** supported the monitoring role of institutions while **Mintz & Schwartz (1985)** showed that institutions are likely to have a passive role in takeover contests and **Pound (1988)** confirmed that institutional shareholders tend to side with managers. Pound argued that institutional investors may have mutual interests and business relationships with incumbent managers which they do not want to disrupt and hence they will not vote against management.

According to the monitoring role hypothesis institutional and other large shareholders increase the probability of a successful takeover. However, if large shareholders perform a passive role or tend to side with managers they are likely to reduce the probability of successful takeovers. Again because of the mixed evidence regarding the monitoring role hypothesis of large shareholders we are unable to predict the nature of the relationship.

Capital structure of the target company.

Another factor which was assumed to be critical in determining the outcome of a bid, is the capital structure (expressed by the debt/equity ratio) of the target firm and changes of this structure in the short-term as part of a defense strategy. There are three main arguments for relating the capital structure of a target firm to the probability of a successful outcome. The first is based on the fact that a highly geared target company reduces the bidder's gain in the post-merger period due to the negative effect of debt covenants, increased interest payments to creditors[4], and reduced debt capacity of the target company. This causes the bidder to offer a lower premium which in turn reduces the probability of a successful outcome. **Palepu (1986)** empirically confirmed this argument.

The second argument is based on the fact that equity has voting rights and thus can be used as part of a takeover defense strategy (especially when the level of managerial interests is high). **Harris & Raviv (1988)** and **Stultz (1988)** established models which describe a relationship between the proportion of shares held by the managers, the value of the outside equity (held by passive investors) and the value of debt. They claimed that the managers equity ownership can increase if managers repurchase shares from passive investors using debt financing. This will reduce the value of the equity but increase proportionally the firm's leverage. Consequently, the managers control will increase because more shares in the hands of the directors enhance their voting rights. This suggests an increased ability of managers to entrench themselves against a hostile bidder.

Dann & De Angelo (1988) demonstrated that the likelihood of an unsuccessful hostile tender offer is higher the greater

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[4] Increased interest payments to debtholders in the post-merger period reduce the level of free cash flow available to the bidder [**Jensen (1986a,b)**].

is the degree of changes in the capital structure which reduce the value of the total equity and increase the proportional managerial shareholdings.

The third argument was established by **Israel (1991)** who investigated the relationship between target company's leverage and the probability of a tender offer success in the context of a transfer of wealth among target shareholders, target debtholders and bidder shareholders. Israel developed a theoretical model showing that if the target company is highly geared the existence of risky debt decreases the value of the firm for the debtholders, increases the gains of target shareholders but decreases the synergistic gain to be captured by the bidder shareholders. This will make the bidder to offer a lower bid premium which in turn will decrease the probability of success.

For all the above reasons we expect that the probability of a successful outcome will be negatively related to the gearing ratio of the target company.

Mode of payment.

Huang & Walkling (1987) argued that there may be a positive relationship between a successful tender offer and the use of cash financing due to the fact that the level of wealth gains is higher in a cash offer. As discussed in section 6.2 of the previous chapter cash offers tend to give higher returns than equity offers in order to compensate the target's shareholders for their tax liabilities expected to arise after the merger.

Also, the fact that cash offers are speedier transactions and are associated with lower valuation risk and information assymetry problems makes it more likely that the takeover bid will be successful. Furthermore, as **Fishman (1989)** argued, a cash offer signals a high value of the target company and is designed to preempt potential rival bidders.

Thus, a cash offer at an relatively high price significantly discourages other bidders. **Sudarsanam (1993)** also offered evidence in support of the argument that cash offers increase the probability of of a bid success.

Due to the preemptive nature of cash offers and the elimination of uncertainty element we also predict a positive relationship between the mode of payment and bid outcome.

Size of target company.

Hoffmeister & Dyl (1981) found that the smaller the size of the target company relative to the bidder the higher the probability of a successful takeover, because market imperfections prevent small bidders from raising enough capital. This fact was also observed in the earlier studies of **Singh (1975)** and **Levine & Aaronovitch (1981)**. Therefore, we hypothesise that the larger is the size of the bidder relative to target the more likely it is that the bid will be successful.

As we mentioned at the beginning of this section we also include in our analysis the effects of **industrial fit** and the **valuation ratio**. Based on our finding, described in the previous section, that related takeovers are more likely to be associated with hostile bids we expect that related bids will be negatively associated with successful takeovers. A possible explanation for this can be the fact that related mergers have an increased probability that the merger will be cancelled as a result of anti-trust regulations.

The second assumption we make is regarding the valuation ratio. We consider that when the market views that the management of the target firm is efficient and its set of investment opportunities is high, then it is more likely that less resistance will be shown. Under this scenario the bid will be friendly and the probability of a successful

acquisition will also increase. Thus, the hypothesis to be tested, is that a high valuation ratio of a target firm increases the likelihood of a successful bid.

The table which follows summarises our hypotheses with respect to outcome. The variables are defined in full in section 6.4.2 of the previous chapter (pp. 205-212). The only variables that are missing from this table are the bidder free cash flows (BFCFLOW1/2) for reasons which we shall explain them later. Due to our simultaneous equations approach, we also include in table 7.1 the hypotheses made in chapter 6 with respect to the wealth gains and mood of bids. The predicted signs of these relationships have been taken from table 6.1 of the previous chapter. However, based on the positive association between industrial fit and hostile bids reported in chapter 6, we have changed the expected sign of INDFIT from negative in table 6.1 to positive in table 7.1.

Table 7.1 Expected sign of the relationship described in our hypotheses.			
Independent Variable	Dependent Variable		
	OUTCOME	WEALTH	MOOD
MOOD	-	+	
WEALTH1/2	+		ne0
BTOEHOLD	+	-	-
SINGLE	-	-	
BDIRSHR		ne0	
BDIRSHR2		ne0	
BLRGSHR		ne0	
TDIRSHR	ne0	ne0	-
TDIRSHR2	ne0	ne0	
TLRGSHR	ne0	ne0	ne0
TGEART	-		-
GEARDIF		+	
TVALRT	+	-	-
VALRDIF		+	
INDFIT	-	+	+
P2	-	ne0	-
P3	ne0	ne0	ne0
P4	ne0	ne0	ne0
P5	ne0	ne0	ne0
CYCLE		+	
LSIZE	+	+	ne0

Table 7.2 Descriptive statistics of the variables used in the sample of 238 bids.				
Variable	**Mean**	**Std.Dev.**	**Min.**	**Max.**
OUTCOME	0.747	0.490	0.000	1.000
WEALTH1	0.269	0.318	-0.960	1.681
WEALTH2	0.592	0.438	-0.415	1.985
MOOD	0.441	0.497	0.000	1.000
BTOEHOLD(%)	3.507	9.565	0.000	63.920
SINGLE	0.806	0.395	0.000	1.000
BDIRSHR(%)	7.714	14.228	0.000	77.070
BDIRSHR2(%)	261.100	852.970	0.000	5940.000
BLRGSHR(%)	23.902	31.744	0.000	93.300
TDIRSHR(%)	9.855	16.641	0.000	82.280
TDIRSHR2(%)	372.900	1043.000	0.000	6770.000
TLRGSHR(%)	23.469	24.621	0.000	92.640
BGEART	0.491	0.121	0.145	0.768
TGEART	0.478	0.151	0.069	1.544
GEARDIF	0.012	0.182	-0.979	0.456
BVALRT	2.115	1.495	0.030	9.696
TVALRT	1.573	1.325	0.034	12.290
VALRDIF	0.273	0.446	0.000	1.000
INDFIT	0.382	0.486	0.000	1.000
P1	0.067	0.250	0.000	1.000
P2	0.159	0.367	0.000	1.000
P3	0.134	0.341	0.000	1.000
P4	0.344	0.476	0.000	1.000
P5	0.294	0.456	0.000	1.000
CYCLE	0.600	0.490	0.000	1.000
LSIZE	1.567	1.425	-2.375	6.729

7.3 Data and Methodology.

7.3.1 Data.

As we discussed in the previous chapter, we have a complete set of information for 238 bids from which 178 (74.79%) were completed and 60 (25.21%) failed. Furthermore, from these 238 bids 105 (44.11%) were hostile and 133 (55.89%) were friendly. In the previous analysis conducted in chapter 6 we dealt only with completed bids. Here we include abandoned and completed bids and hence our sample is increased to 238 observations.

For the purposes of our analysis we use the same variables presented in the previous chapter except the fact that we do not include the bidder's free cash flow (BFCFLOW1/2) variable in the WEALTH equation and we add another definition of wealth gains using a bid premium framework. In the Finance literature [e.g. **Datta, et.al. (1992)**] wealth gains are measured in terms of abnormal returns estimated by event studies methodology while in the Industrial Economics literature [e.g. **Walkling & Edmister (1985), Slusky & Caves (1991)**] they are measured in terms of bid premium captured by target shareholders. In the previous chapter in which we examined the wealth gains of bidding, target and combined firms we used only the abnormal returns definition. However, in this chapter we shall also use a bid premium definition in addition to our wealth gains measure.

The bid premium variable (BPREM) which is frequently used in the Industrial Economics literature as a proxy for shareholder wealth gains can be defined as :

$$BPREM = \frac{VALUE\ OF\ THE\ FINAL\ OFFER - MV(-4)}{MV(-4)} \qquad (7.1)$$

where MV(-4) is the market value of the target company at the end of the fourth month before the announcement of the bid excluding the value of the shares already owned by the

bidder (BTOEHOLD). To distinguish the abnormal returns measure from BPREM we decided to call the first measure WEALTH1 and the second measure WEALTH2.

As we can see from table 7.2 the mean value of WEALTH1 is 26.9% which is 1% lower than the one reported for TWEALTH in table 6.2 in chapter 6 for the sample of 178 completed takeover bids. The standard deviation of WEALTH1 is 31.8%, the minimum value is -96.0% and the maximum value is 168.1%. However, the mean value of WEALTH2 (bid premium definition) is 59.2% which is much higher than WEALTH1. The standard deviation of WEALTH2 is 43.8%, the minimum value is -41.5% and the maximum value is 198.5%.

However, we consider that the abnormal returns definition is a better measure of the impact of takeovers on target firms than the bid premium definition for two reasons. First, because it contains more information about the distribution of wealth gains than WEALTH2 which uses only two values at two distinct points of time to calculate the takeover gains. Second, WEALTH1 is estimated by the FR-Model which adjusts for market risk while WEALTH2 does not adjust for changes in risk and therefore gives a higher estimate of wealth gains.

Looking at table 7.2 we can also notice, that from the other continuous variables BTOEHOLD has an average value of 3.5% and a maximum value of 63.9% which are almost identical to the corresponding BTOEHOLD values of the sample in chapter 6. The mean value of bidder's directors interests (BDIRSHR) is 7.7% in this sample which is lower than the corresponding figure of 9.9% for target companies. As in the previous sample, large shareholdings are at a substantially high level both for bidders and targets. Thus, bidder's large shareholdings (BLRGSHR) have an average value of 23.9% and target's large shareholdings (TLRGSHR) have a mean value of 23.5%.

It seems from the descriptive statistics of table 7.2 that bidders have on average higher leverage than targets. Also, bidding companies have on average a higher market valuation than target firms. Thus, the bidder's gearing ratio (BGEART) is 0.49 with a minimum value of 0.14 and a maximum value of 0.77 while the average target's gearing ratio (TGEART) is 0.48 with a minimum value of 0.07 and a maximum value of 1.54. This shows that target firms are on average slightly less geared than bidding firms, although more extreme values are observed for TGEART. Finally, the average value of bidder's valuation ratio (BVALRT) is 2.1 with a minimum of 0.03 and a maximum of 9.7 while the average target's valuation ratio (TVALRT) is 1.6 with a minimum of 0.034 and a maximum of 12.3. Again more extreme values are observed in the case of target companies, although bidders have on average higher valuation ratios than targets.

7.3.2 Some methodological issues.

The main objective of this chapter is to find the determinants of the outcome of a bid. As mentioned at the beginning of this chapter we have to examine simultaneously the outcome, wealth and mood and therefore we construct a system of three equations which has the following form :

$$\text{OUTCOME} = f\{\text{WEALTH, MOOD, } \underline{Z}\} \qquad (7.2)$$

$$\text{WEALTH} = f\{\text{MOOD, } \underline{X}\} \qquad (7.3)$$

$$\text{MOOD} = f\{\text{WEALTH, } \underline{Y}\} \qquad (7.4)$$

where OUTCOME is a dummy variable equal to 1 if the bid is successful and equal to 0 if the bid is unsuccessful, WEALTH is the wealth gains reflected by WEALTH1 or WEALTH2 and MOOD is again a dummy variable taking a value of 1 if the bid is hostile and 0 if the bid is friendly. Finally, the vectors $\underline{Z}$, $\underline{X}$ and $\underline{Y}$ are the exogenous variables included in each equation.

To estimate the OUTCOME and MOOD equations we need to use a logit estimator described in the previous chapter for MOOD. The WEALTH variables (WEALTH1/2) are in continuous form and hence the WEALTH equation can be estimated by the standard OLS method. As explained in chapter 6, if the OUTCOME, WEALTH1/2 and MOOD prove to be statistically endogenous we can make use of the two-stage mixed logit estimator described in **(Maddala, 1983 : 244-5)** which is especially designed for this kind of model.

To determine the issue of whether or not the two-stage estimator of Maddala is necessary in order to estimate the above equations we have to perform the **Hausman test of exogeneity** on the OUTCOME, WEALTH and MOOD variables. While the Hausman test for WEALTH and MOOD is specified in exactly the same way as we described in section 6.5 of the previous chapter, the test for OUTCOME is designed slightly differently. The OUTCOME equation contains two explanatory variables which are assumed to be endogenous and in this case as, shown by **Maddala (1992)**, we should test **jointly** the significance of these hypothesised endogenous variables.

The **expanded regression equations** of WEALTH and MOOD are :

$$WEALTH = \beta_3 MOOD + \alpha_i X + \gamma_3 MOODF + u_i \qquad (7.5)$$

$$MOOD = \beta_2 WEALTH + \alpha_i Y + \gamma_2 WEALTHF + u_i \qquad (7.6)$$

where WEALTHF and MOODF are the predicted values of WEALTH and MOOD which are obtained from the appropriate reduced form equations. We use equations 7.5 and 7.6 in order to test the hypotheses that $\gamma_2=0$ and $\gamma_3=0$.

The **expanded regression equation** of OUTCOME is :

$$OUTCOME = \beta_2 WEALTH + \beta_3 MOOD + \alpha_i \underline{Z} + \gamma_2 WEALTHF + \gamma_3 MOODF + u_i \quad (7.7)$$

for which we test the hypothesis :

$$\gamma_2 = \gamma_3 = 0$$

by applying the procedure which follows. This procedure uses an ommited variable method including five steps. In the first step we obtain the residuals for WEALTH and MOOD, denoted WEALTHRES and MOODRES[5].

$$WEALTHRES = WEALTH - WEALTHF$$
$$MOODRES = MOOD - MOODF$$

In the second step we estimate the covariance matrix of the residuals and obtain its inverse. In the third step, we construct linear combinations of the residuals with the elements of the inverse in order to create the ommited variables x_2 and x_3 for the expanded regression equation. The fourth step involves estimation of the following logit model:

$$OUTCOME = \beta_2 WEALTH + \beta_3 MOOD + \alpha_i \underline{Z} + \gamma_2 x_2 + \gamma_3 x_3 + u_i \quad (7.8)$$

and the reduced form equation :

$$OUTCOME = \beta_2 WEALTH + \beta_3 MOOD + \alpha_i \underline{Z} + u_i \quad (7.9)$$

Then, in the fifth step we compare the Log Likelihood under restrictions obtained from equation (7.9) with the Log Likelihood of the equation (7.8) which does not impose any restrictions (x_2 and x_3 are included). Using the Log

[5] The residuals WEALTHRES and MOODRES can also be used in equation (7.5) and (7.6) instead of WEALTHF and MOODF.

Likelihood estimates from the above equations we calculate a x^2 statistic based on the following formula[6] :

$$x^2 = -2[L_R - L_{UR}] \quad (7.10)$$

where L_R is the maximum of the likelihood function when maximised with respect to all parameters and L_{UR} is the maximum when maximised with the restriction $\beta_i=0$ for i=1,2,..,k. In our case the number of restrictions is 2 as many the endogenous variables are in the OUTCOME equation. Then, we compare the above x^2 with the corresponding x^2 obtained from the tables of chi-square distribution for 2 degrees of freedom.

[6] See **Maddala (1992)**, pp.119-120.

7.4 Explaining the outcome of bids.

As we show in appendix 7.1 the Hausman test gives a x^2-statistic which is much lower (in both equations 1 and 2) than the tabulated value and therefore we can accept the hypothesis that OUTCOME, WEALTH and MOOD are statistically exogenous. Consequently, we can proceed to report the results obtained from the single equations presented in tables 7.3-7.5.

The model we constructed to explain the outcome of bids contains the MOOD, WEALTH1/2, BTOEHOLD, SINGLE, TDIRSHR, TDIRSHR2, TLRGSHR, TGEART, TVALRT, INDFIT, P2,P3,P4,P5 and LSIZE variables aiming to test the hypotheses set in section 7.2. As one can see from table 7.3 we estimate two equations based on the different definition of wealth gains. Thus, the first equation is based on the abnormal returns definition (WEALTH1) while the second one is based on the bid premium definition (WEALTH2).

Looking at table 7.3 we can clearly observe that both equations give a negative and highly significant (at 1% level, one tail test) sign for the MOOD variable. MOOD is the most significant variable in the equations generating a t-stat. value of -5.9 and -5.8 with WEALTH1 and WEALTH2 definitions respectively. This seems to explain a large part of the likelihood of failed bids. Thus, hostile bids as predicted decrease the probability of a successful takeover.

On the other hand the size of wealth gains offered to target shareholders increase the probability of bid success since the coefficients of WEALTH1 and WEALTH2 are positive and significant at the 5% level (one tail test) in both equations.

Another variable which moves in the predicted way is BTOEHOLD. The positive and significant (at 5% level in the first equation and at 10% level in the second one)

coefficient of BTOEHOLD shows that when the bidder already controls a fraction of target's shares before the bid it is easier for him to acquire the target and hence the probability of a successful outcome increases.

The proxy variables for agency costs also make a large contribution in explaining the outcome of bids in both equations. Directors interests examined in a non-linear form give a negative and significant sign (at 5% level, one tail test) in TDIRSHR while directors interests in TDIRSHR2 generate a positive and significant sign (at 5% level, one tail test). This indicates that managers of target firms holding a small fraction of their companies' stock had possibly shown a non-value naximising behaviour in the past and thus they are more likely to resist the bids which threaten their preference for control. However, by doing that they at the same time reduce the probability of success. However, the opposite occurs when managerial shareholdings are high (reflected by TDIRSHR2). In this case managers are more likely to align their interests with those of the other shareholders and sell their shares.

Finally, the TLRGSHR variable gives a negative and significant sign (at 1% level, two tail test) in both equations which shows that institutional and other large shareholders tend to behave in the same way as managers with a low level of shareholdings (TDIRSHR2) decreasing the probability of successful takeovers.

The valuation ratio (TVALRT) of the target company is positive and significant (at 5% level, one tail test) in both equations, a finding which confirms our hypothesis that firms which have a high valuation ratio have a higher probability of being acquired.

All the remaining variables, namely SINGLE, TGEART, INDFIT, P2,P3,P4,P5 and LSIZE, were insignificant in both equations,

although some had the expected sign. This indicates that these variables cannot satisfactorily explain the outcome of bids in our sample.

Finally, as we can see from the bottom of table 7.3 the overall fit of the logit regression model which we used to obtain our results is rather good giving for the first equation a Log Likelihood Ratio (LRI) of 31.05% with a x^2 equal to 83.5 which is statistically significant at the 1% level. In the second equation LRI is equal to 30.6% with a x^2 of 82.29 which is also statistically significant at the 1% level.

Table 7.3 Determinants of the Outcome of Bids using Logit multiple regression analysis.				
Independent Variable	Equation based on the measure of wealth gains.			
	(1)		(2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	3.04470[a]	2.383	3.21669[a]	2.501
WEALTH1	1.30226[b]	2.103		
WEALTH2			0.80248[b]	1.811
MOOD	-3.04217[a]	-5.904	-2.95806[a]	-5.832
BTOEHOLD	0.04067[b]	1.651	0.03081[c]	1.310
SINGLE	-0.42110	-0.772	-0.51124	-0.940
TDIRSHR	-0.14889[b]	-2.100	-0.14253[b]	-2.032
TDIRSHR2	0.00447[b]	2.014	0.00419[b]	1.916
TLRGSHR	-0.01938[a]	-2.459	-0.02029[a]	-2.561
TGEART	-0.03616	-0.028	-0.13993	-0.104
TVALRT	0.49438[b]	2.178	0.46318[b]	2.078
INDFIT	-0.02938	-0.075	-0.10294	-0.264
P2	-0.18878	-0.221	-0.51260	-0.593
P3	-0.17987	-0.217	-0.22014	-0.264
P4	0.62763	0.809	0.50766	0.646
P5	0.05342	0.068	-0.04094	-0.052
LSIZE	-0.14334	-0.898	-0.12691	-0.804
LRI	31.05%		30.61%	
x^2	83.474		82.282	
Prob. for x^2	0.00000		0.00000	

Note : a is significant at 1% level of significance
b is significant at 5% level of significance
c is significant at 10% level of significance.

7.5 Explaining the wealth gains of target companies.

As mentioned in section 7.3.1 our model explaining wealth gains of target firms includes the same variables (except BFCFLOW1/2[7]) we used in the previous chapter to determine the creation of wealth in completed takeovers. As shown in table 7.4, our overall results obtained using the WEALTH1 equation are by and large the same as those reported in section 6.7 of chapter 6 with the exception of a few variables and the fact that we obtain a lower R^2.

However, the results obtained using the WEALTH2 equation (based on the bid premium definition of wealth) are quite different from those reported in the previous chapter. This is particularly true of the role of MOOD, BTOEHOLD and TDIRSHR which we discuss below.

In the equation of WEALTH1 the MOOD variable has a positive and significant (at the 5% level) coefficient which shows that hostile bids increase target's returns. However, in the WEALTH2 equation, MOOD becomes insignificant suggesting that the mood of bids does not influence the bid premium. This finding resembles the results of **Walkling & Edmister (1985).**

A similar difference in the significance of the coefficients obtained from the two equations arises in the case of BTOEHOLD. The WEALTH1 equation produces a negative and highly significant (at the 1% level) sign of BTOEHOLD indicating that target shareholders lose when the bidder has a pre-merger equity interest in their company confirming the results of **Stulz, et.al. (1990).** However, the WEALTH2 equation generates an insignificant negative sign suggesting that BTOEHOLD does not affect the bid premia captured by

[7] BFCFLOW1 and BFCFLOW2 proved to be insignificant in the equations of target's wealth gains in completed bids presented in the previous chapter. After we included this variable in the current sample we again found it to be insignificant and as it is only a control variable in our analysis we decided to drop it.

target shareholders.

In both the WEALTH1 and WEALTH2 equations the signs of TDIRSHR and TDIRSHR2 are negative and insignificant. Looking at the agency variables (directors and institutional interests) in the first equation we can observe that although they produce the same signs as in the analysis of completed bids in chapter 6 they are still insignificant. Even the BDIRSHR2 and TLRGSHR variables which were found to be significant in the previous chapter are not any longer here.

The other variables give results which are not sensitive to the definition of wealth gains used and they are not different from those reported in chapter 6. The SINGLE variable has the expected negative sign but is not significant in both equations, although in the WEALTH1 equation its t-ratio is very close to the critical value of 1.28 at the 10% level of significance. Thus, the behaviour of SINGLE very much resembles that exhibited in chapter 6 for the sample of 178 completed takeover bids.

Also, in both the WEALTH1 and WEALTH2 equations the financial synergies (GEARDIF) and the industrial relatedness (INDFIT) variables appear to be insignificant as in chapter 6.

From the other variables the TVALRT, VALRDIF, CYCLE and LSIZE variables are all statistically significant (at least at the 5% level) in both equations behaving as predicted. Thus, target companies with low valuation ratios make more wealth gains and the target's gains are also high when the bidder's valuation ratio is higher than the target's valuation ratio. Moreover, target companies make more gains when there is a boom period of economic activity and when they are smaller relatively to bidders.

One interesting point is that using the same definition of wealth gains (WEALTH1) we obtain different results regarding equity offers (P2) from those obtained in our previous analysis. In particular P2 is no longer significant suggesting that pure equity offers do not perform better or worse than pure cash offers. The other payment variables P3,P4,P5 have a positive and significant sign showing that even if we increase the sample to 238 bids[8] cash offers still perform worse than any other combination (except pure equity). However, if we look at the WEALTH2 equation P2 still gives higher returns than P1 suggesting that using the bid premium definition of wealth gains our results do not change from those presented in the previous chapter.

Finally, if we look at the bottom of table 7.4 we can see that the overall fit of the OLS regression model used to obtain the above reported results is lower than the one reported in table 6.4. Thus, the R^2-adjusted for WEALTH1 equation is 14% compared to an earlier figure of about 22%. However, the above figure of R-squared is statistically significant with an F-statistic of 3.02. The lower explanatory power of the regression model using WEALTH1 may be attributed to the fact that we have here a different sample which includes failed bids as well completed bids. Some of the explanatory variables which in the previous sample were significant are no longer here. These variables are the TLRGSHR, BDIRSHR2 and P2, while some others such as P3, P4 and P5 are significant at a lower level of significance in this sample.

Moreover, the R^2-adjusted in the WEALTH2 equation is 7.1%, which is almost half of the value in the first equation, but is significant with an F-statistic of 1.95. This may be

[8] From these 238 bids 16 are pure cash offers (P1), 38 are pure equity (P2), 32 are cash and equity (P3), 82 are cash or equity (P4) and 70 are any other form of payment (P5).

explained by the fact that WEALTH2 is defined using two distinct points of time, namely the market value of companies 4 months before the bid and the final value of the offer on the outcome date. This lack of information about the distribution of wealth gains during the bid period, may be responsible for the lower explanatory power of the WEALTH2 equation.

Table 7.4 Determinants of Wealth Gains using OLS multiple regression analysis.

Independent Variable	Equation based on the measure of wealth gains.			
	(WEALTH1)		(WEALTH2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	0.11754	1.048	0.20747[c]	1.294
MOOD	0.07697[b]	1.741	0.02980	0.472
BTOEHOLD	-0.00061[a]	-2.771	-0.00097	-0.307
SINGLE	-0.06353	-1.236	-0.04839	-0.658
BDIRSHR	0.00363	0.929	0.00509	0.913
BDIRSHR2	-0.00007	-1.133	-0.00008	-0.955
BLRGSHR	0.00031	0.495	0.00054	0.606
TDIRSHR	0.00009	0.026	-0.00109	-0.209
TDIRSHR2	-0.000007	-0.127	-0.0000002	-0.003
TLRGSHR	-0.00067	-0.778	0.00022	0.184
GEARDIF	0.05116	0.444	-0.04073	-0.247
TVALRT	-0.03389[b]	-2.018	-0.05240[b]	-2.183
VALRDIF	0.08664[b]	1.743	0.13829[b]	1.946
INDFIT	-0.02863	-0.692	-0.01074	-0.182
P2	0.02293	0.237	0.30813[b]	2.228
P3	0.12421[c]	1.286	0.19528[c]	1.415
P4	0.19296[b]	2.237	0.40985[a]	3.325
P5	0.16102[b]	1.837	0.31357[a]	2.503
CYCLE	0.06350[c]	1.597	0.10343[b]	1.821
LSIZE	0.03742[b]	2.291	0.43256[b]	1.853
R^2	20.87%		14.56%	
R^2-adj.	13.97%		7.11%	
F-stat.	3.02		1.95	
Prob.for F.	0.00005		0.011	

Note : a is significant at 1% level of significance
b is significant at 5% level of significance
c is significant at 10% level of significance.

7.6 Explaining the mood of bids.

We used again the same variables, discussed in chapter 6 to explain the mood of bids and in general we obtained similar results. In addition to the WEALTH1 definition used in the previous chapter we employed here the bid premium definition WEALTH2.

All the variables are significant and behave in the predicted way, except BTOEHOLD which in both equations gives the predicted negative sign but is insignificant in each case. Also, WEALTH2 in the second equation gives a positive but insignificant sign. However, in the first equation WEALTH1 has a positive sign and is significant at the 10% level. Thus, while in the first equation the size of wealth gains is positively associated with the probability of hostile bids in the second equation there is no such association. The latter is a finding which is similar to that reported by **Walkling & Long (1984)** but is in conflict with the first equation and our results reported previously.

As in chapter 6, we also used an alternative measure of WEALTH1 confined to month 0 (announcement month) in order to check if the cumulative average abnormal return over a period of 6 months (3 months before the bid until 2 months after the bid) is inappropriate for predicting the mood of a bid. From the results obtained, WEALTH1 in month 0 gave a significant coefficient of 3.41 (at the 1% level) with a positive t-ratio of 3.51 suggesting a positive association between wealth and mood.

TDIRSHR generated a coefficient which is negative and highly significant in both equations confirming again our hypothesis and the finding of **Morck, et.al. (1988a)** that low directors shareholdings in the target firms are associated with hostile bids.

Large shareholdings in the target company do not have any

influence on the mood of bids as the insignificant sign of TLRGSHR shows. This conflicts with what we found in the previous chapter regarding the negative relationship between large shareholdings and hostile bids.

However, the TGEART, TVALRT, P2,P3 and LSIZE variables influence negatively the probability of a hostile bid and these results hold for both equations. With respect to the impact that the gearing ratio (TGEART) has on the mood of bids we found that heavy leverage of the target company reduces the probability of receiving a hostile takeover bid. This may occur as **Stulz (1988)** argued because of debt covenants in the post-merger period that restrict the sale of assets and reduce the post-merger value of the target firm for the hostile bidder.

Probably the most interesting finding here is that TVALRT is negatively associated and statistically significant in both equations (at the 10% and 5% level accordingly) with the likelihood of hostile bids. This confirms our hypothesis which we set in chapter 6 that firms with low valuation ratios are more likely to receive hostile bids.

Equity offers P2 are negatively related to hostile bids possibly because, as we also argued in the previous chapter, when an equity offer is made the management of the target company may prefer to adopt a friendly approach in order to minimise the valuation risk problems associated with equity offers. It was also established that a large size of bidder relative to target (LSIZE) decreases the likelihood that the bid will be hostile.

Finally, INDFIT is positively related (significant at the 10% level) with MOOD showing that related bids are more likely to be hostile than friendly. As in the previous chapter, this finding contradicts the results reported by **Walkling & Long (1984)** who found that related bids are more

likely to be friendly.

The logit model we described above gives for the first equation an LRI of 17.9% with a x^2 of 58.4 which is statistically significant at the 1% level and an LRI of 17.3% for the second equation with a x^2 of 56.4 which is statistically significant at the 1% level of significance. The LRI reported here is lower than the corresponding one in the mood equation of the sample of 178 completed bids.

Table 7.5 Determinants of the Mood of bids using Logit multiple regression analysis.				
Independent Variable	Equation based on the measure of wealth gains.			
	(1)		(2)	
	Coef.	t-stat.	Coef.	t-stat.
Constant	2.72268[a]	2.786	2.90228[a]	3.003
WEALTH1	0.75941[c]	1.487		
WEALTH2			0.00155	0.440
BTOEHOLD	-0.01014	-0.613	-0.01527	-0.944
TDIRSHR	-0.07295[a]	-4.120	-0.07359[a]	-4.193
TLRGSHR	-0.00487	-0.763	-0.00521	-0.820
TGEART	-2.22089[b]	-1.934	-2.29333[b]	-2.035
TVALRT	-0.24265[c]	-1.522	-0.28201[b]	-1.786
INDFIT	0.44401[c]	1.410	0.41817[c]	1.339
P2	-1.61788[b]	-2.145	-1.68800[b]	-2.253
P3	-0.35766	-0.491	-0.32546	-0.451
P4	-0.98410[c]	-1.460	-0.91210[c]	-1.360
P5	-0.56990	-0.839	-0.51908	-0.771
LSIZE	-0.29101[b]	-2.320	-0.26592[b]	-2.166
LRI	17.89%		17.26%	
x^2	58.439		56.373	
Prob.for x^2	0.00000		0.00000	

Note : a is significant at 1% level of significance
b is significant at 5% level of significance
c is significant at 10% level of significance

7.7 Discussion of our Results.

The primary objective of this chapter was to explain what determines the outcome of bids. To serve this purpose we developed and estimated a system of three equations designed to explain the outcome, wealth and mood of takeover bids.

The variables which emerged as crucial in determining the outcome were the mood, wealth gains, the level of directors shareholdings and the valuation ratio of the target firm. First, we found that hostile bids reduce the probability of success. On the other hand, higher wealth gains (or bid premia) offered to target shareholders increase the supply of shares to be sold and consequently the probability of success. Thus, the mood and wealth affect the outcome. This finding, which is not sensitive to the definition of wealth gains, confirms our hypotheses and is in accordance with earlier findings of **Hoffmeister & Dyl (1981)** and **Walkling (1985).**

We also observed that low levels of directors interests decrease the probability of successful bids and high levels of directors interests increase the same probability. Thus, we can conclude that contrary to the entrenchment hypothesis of **Stulz (1988)**, alignment occurs at high levels of managerial interests. This is caused by the fact that when directors hold a large proportion of share capital they are motivated first to increase the value of their holdings and second to sell their shares and securing the proposed takeover if this is in the their best interests. Our results are therefore in keeping with the findings of **Ambrose & Megginson (1992)** and **Song & Walkling (1993).**

It was also found that a low valuation ratio decreases the probability of successful bids. It seems that a target company with a low valuation ratio attracts hostile bids which in turn reduce the probability of success.

There are two further factors that we have identified in the analysis of the previous section as having an influence on the outcome of bids. These are BTOEHOLD and TLRGSHR. The existence of a bidder's toehold increases, as predicted, the probability that the bid will be successful because less shares need to be sold in order for the bidder to obtain effective control of the target company and because the mood of the bid is likely to be friendly. This finding confirms the theoretical model of **Shleifer & Vishny (1986)** and sides with the empirical study of **Walkling (1985)**.

Furthermore, it was established that institutional or any other large shareholders tend to side with directors holding a low level of shareholdings and hence they may fail to perform an effective monitoring role.

As mentioned at the beginning of this section, we also investigated the determinants of wealth gains and mood of bids. From the results reported in sections 7.5-7.6, we observe that using the abnormal returns definition of wealth gains we obtained more or less similar results to those reported in the previous chapter[9]. Based on these results, there are three main issues which we would like to discuss below. These are the sources of target wealth gains, the agency problem and the mutual dependence between wealth and mood.

First, we identified the various sources of takeover gains for target shareholders. Thus, we found that factors such as the mood, valuation ratio, bidder's toehold, mode of payment and relative size of bidder to the target were more important for the creation of wealth gains than operational or financial synergies. However, we found some evidence

[9] Due to the reasons mentioned in section 7.3.1, we consider the abnormal returns definition of wealth gains as more reliable compared with that of bid premium in reaching our conclusions.

supporting the argument of managerial synergies.

Our finding that target firms realise higher gains when the mood is hostile and the bidder's toehold is low is in line with similar results reported in the previous chapter and in the study of **Walkling (1985)**. In a hostile bid the resistance of the managers of the target company causes the bidder to increase the bid premium in order either to encourage the management to recommend the bid or to persuade the shareholders to sell their shares. In eash case the final wealth gains are higher. However, the existence of a bidder's toehold reduces the number of shares required to be purchased and makes it more likely that the bidder will complete the bid even with a lower bid premium.

We also found a positive relationship between WEALTH1/2 and TVALRT and VALRDIF supporting the validity of our hypothesis that first targets with low valuation ratios make higher gains in takeover bids and second the gains are also higher when the same targets are taken over by bidders with high valuation ratios. This coincides with the results obtained by **Walkling & Edmister (1985)** and **Lang, et.al. (1989)**. The negative relationship between the targets valuation ratio (TVALRT) and wealth gains can be also explained by the existence of information assymetries as we argued for similar results obtained in the previous chapter. The positive relationship between VALRDIF and WEALTH indicates that the creation of managerial efficiencies may be one of the primary motives of takeovers and a significant source of gains.

Another factor which explained the wealth gains was the mode of payment. However, our finding regarding the behaviour of P2 (equity offers) differs from the one reported in chapter 6 because P2 is insignificant here showing that equity offers do not perform better or worse than cash offers. Besides this divergence our results regarding the other

forms of payment (P3,P4,P5) look similar to those reported in chapter 6 and contradict those documented in the majority of previous empirical studies [**Huang & Walkling (1987), Franks, Harris & Mayer (1988)**]. It seems that the mixed form offers outperform the pure cash offers and this resembles the findings of **Giammarino, et.al. (1990)** for bidders in Canadian takeover bids. However, one could argue that our results are sample specific since we have only 16 out of 238 bids which are cash offers.

Finally, it was established that the relative size of the bidder to target (LSIZE) and the macroeconomic growth reflected in the CYCLE variable had a positive impact for the creation of target's wealth gains as predicted in chapter 6.

As mentioned above, we identified the existence of the agency problem in the target firms and the way it is mitigated by the market for corporate control. However, the agency problem cannot be directly detected from the WEALTH equations because, as in the previous chapter, the behaviour of the directors shareholdings variable in the wealth equation does not support either the alignment or the entrenchment hypothesis. To understand the presence of the agency problem we have to look at the behaviour of target directors shareholdings and valuation ratio variables in the MOOD and OUTCOME equations.

The negative linear relationship between TDIRSHR and MOOD tells us that a low level of managerial interests in the target company increases the probability that the bid will be hostile. This may be explained by the fact that when directors hold a low fraction of their company's shares they are not likely to maximise the value of their company and hence the value of the target firm in the pre-bid period should be low. This argument is further confirmed by the negative relationship between the target valuation ratio and

the mood of bids. In other words, a low valuation ratio combined with low levels of directors interests increases the probability of hostile bids. This finding supports the argument of **Morck, et.al. (1988a)** about the disciplinary role of hostile bids.

Thus, the agency problem is likely to exist in the target firms with a low level of managerial shareholdings and a low valuation ratio. These two factors will encourage in turn hostile bids which provide the means whereby the market alleviates agency costs and replaces inefficient management. However, the management of these firms will attempt to resist these bids and hence the probability of success should be lower. Consistent with this scenario is the behaviour of directors shareholdings (TDIRSHR,TDIRSHR2) in the OUTCOME equation which indicates that when the level of managerial interests is low we tend to have a lower probability of success. The opposite occurs when the level of managerial ownersip is low and the valuation ratio is high because in this case the bid will be friendly and synergistic.

Finally, it also seems that the wealth, using the WEALTH1 definition, affects the mood and the variables are mutually dependent. Thus, higher wealth gains offered to target shareholders increase the probability of hostile bids. Although, according to **Baron (1983)** we should expect that lower bid premia should lead to hostile bids our finding can be explained by the **Morck, et.al. (1988a)** argument of the disciplinary nature of hostile bids. It seems here that target firms, in which the managers have followed a value decreasing policy, will receive disciplinary bids. These bids, which will be hostile, will generate higher wealth gains in anticipation of the correction of managerial failure rather than the creation of operational synergies. Thus, managers are likely to resist these bids even if they offer higher wealth gains for their shareholders and this is

another sign of the existence of the agency problem.

7.8 Summary and Conclusions.

This chapter attempts to serve the third objective of our thesis which is to find what determines the outcome of bids using a simultaneous equations approach.

Based on our discussion in the previous section we can summarise our conclusions as follows. First, with respect to the main objective of this chapter we identified the determinants of the outcome of bids. We found that the mood, the wealth gains offered to target shareholders, the directors and large shareholdings interests, the value of the target firm and the bidder's toehold all contribute to the probability of success of a takeover bid. The most important variable in explaining the outcome of takeover bids was the mood, which was discovered to be negatively related with the probability of success. Also negatively related with the probability of success were found to be low levels of managerial shareholdings and the existence of large shareholders, while the wealth gains, the valuation ratio and the bidder's toehold proved to be positively related.

The second conclusion is that the agency problem exists in target firms though it is alleviated by the disciplinary mechanism of the market for corporate control, i.e. by hostile bids. Due to the simultaneous equation approach applied, we have been able to detect the specific relationship among the mood, wealth and outcome. Thus, we found how the mood is determined by showing that a low level of directors shareholdings in the pre-bid period encourages managers to follow a non-value maximising policy which causes in turn the valuation ratio to decline. As a result, the probability that the target company will receive a disciplinary bid is increased. However, when the mood of the

bid is hostile the probability of a successful outcome is reduced and the size of wealth gains offered to target shareholders increase. Therefore, the role of the mood is decisive in determining the outcome and the wealth gains.

A third conclusion, which is related to the previous one, concerns the role of managers with equity interests in the target firms. We found that the impact of the agency problem is mitigated when managers hold a large proportion of shares, because in this case the probability that the bid will be friendly and the takeover will be completed is increased. In other words, we found that alignment of directors interests with the other shareholders interests is more likely to take place at high levels of directors shareholdings.

The fourth conclusion is that the wealth gains and mood are mutually dependent variables. Thus, hostile bids increase the wealth gains of target companies and the probability that a company will receive a hostile bid is higher when the bid premium offered to target shareholders is high. This is because, the wealth effects of disciplinary bids are expected to be higher than those of synergistic bids and as our results showed wealth gains are less likely to arise from operational synergies than from the replacement of inefficient management and the solution to the agency problem.

Fifth, we showed that short-run factors as well as a number of other factors explain the creation of wealth gains better than long-run factors. Thus, we did not find any sign of long-run factors such as operational or financial synergies reflected in the target's wealth gains. However, we discovered some evidence of managerial synergies. Furthermore, we found that the mood of the bid, the size of the bidder relative to target firm, and the business cycles increase the wealth gains of target companies. On the other

hand, the bidder's toehold, the valuation ratio and the mode of payment were discovered to be negatively associated with target wealth gains.

Finally, with respect to the determinants of the mood of bids we confirmed the findings reported in chapter 6. Thus, in addition to the size of wealth gains, level of managerial ownership and the valuation ratio, other factors which can explain the mood are the mode of payment, the relative size of bidder to target firm, the gearing ratio and the industrial fit. From these factors, only the size of wealth gains and the industrial fit were found to be positively related with hostile bids.

Appendix 7.1

Results obtained from the Hausman test for the outcome equation.

As one can recall from section 7.3.2 we obtain the Log Likelihood under no restrictions (L_R) from equation (7.8) and the Log Likelihood with restrictions (L_{UR}) from equation (7.9) in order to estimate equation (7.10) which is :

$$x^2 = -2[L_R - L_{UR}]$$

For equation (1), $x^2 = -2[(-92.645)-(-92.527)] = 0.236$ and $0.236 < 5.991$ (critical value of x_2 at 5% level of significance for 2 degrees of freedom).

For equation (2), $x_2 = -2[(-93.241)-(-93.016)] = 0.45$ and $0.45 < 5.991$.

Thus, in both equations (1) and (2) of the outcome equation WEALTH and MOOD are statistically exogenous.

The coefficients of the predicted value of mood (MOODF) obtained from the Hausman test (applying equation 7.5) are insignificant in both equations (WEALTH1 & WEALTH2) of table 7.4 at least at the 5% level. The t-ratio of MOODF in equation WEALTH1 was found to be 1.4 and the t-ratio of MOODF in equation WEALTH2 was 0.97 and therefore we conclude that the mood variable is statistically exogenous in the WEALTH equation. The Hausman test also produces an insignificant coefficient of the fitted values of wealth (applying equation 7.6) with a t-ratio of -0.64 for WEALTHF1 and -0.26 for WEALTHF2 suggesting that the WEALTH variable is statistically exogenous in the MOOD equation.

CHAPTER 8
CONCLUSIONS

8.1 Introduction.

The main purpose of this chapter is to summarise and highlight the main conclusions reached in the three previous chapters with respect to the primary objectives of this thesis. The objectives of our research were first to find whether or not mergers increase the shareholder's wealth, second to identify the determinants of the wealth gains created, third to investigate the factors influencing the mood and fourth to find what determines the outcome of bids.

We begin the chapter by summarising the results we obtained with respect to each of the four objectives mentioned above. At the same time we attempt to relate our findings to the merger theories discussed in chapter 2 and emphasise their implications for shareholders, managers and government policy.

8.2 Do takeover bids create wealth ?

This issue was extensively examined in chapter 5 using event study methodology. The analysis was performed initially using a sample of 354 completed and abandoned bids during the period 1963-1989. To estimate the total wealth gains of the combined firms we used a sample of 253 bids during the 1979-1989 period for which we had the necessary data. The results and conclusions which are summarised below are based on both samples.

First, target companies make large gains, while bidding firms make small losses and this results in a small overall gain for the combined firm. This conclusion concerns the

short observation period, i.e. from three months before the bid announcement when the market begins anticipating the event until two months after, which is usually the outcome date. The above results do not give strong support for the argument that takeover activity is profit related as the profit-maximisation theories suggest because only the target shareholders gain and this is at the expense of bidder shareholders.

Second, bidding firms when examined in the long run, i.e. 2 years after the outcome date of the bids, suffered large losses. This finding which suggests that mergers are bad investments, supports either the argument that bidding companies managers are motivated by the growth in size rather than the maximisation of profits or that managers made mistakes in predicting the expected takeover gains. The first argument supports the managerial theories while the latter indicates the existence of managerial hubris.

Although, we cannot exclude the possibility of bidder's overpayment due to hubris and the existence of the agency problem in the bidding firms, we also cannot be particularly confident about the large magnitude of losses reported for these firms. The reason for that is the inability of existing pricing models to accurately estimate the abnormal returns over a long observation period. As mentioned in chapter 4, when we examine the long term performance of companies the bias in the estimates obtained, for example by the market model, is quite severe due to the shifts in the alphas and betas and the size effect problem.

Third, in addition to the issue of value creation in takeover bids we also examined the issue of differences of the wealth effects between completed and failed bids making a first attempt to investigate the possible source of takeover gains. Our results showed that there is no statistically significant difference in the wealth gains

between completed and abandoned bids both in the short-run and the long-run. Moreover, we found no significant difference in the returns obtained between bids subsequently acquired and bids failed in the 2 year post-outcome period. This further suggests, as we concluded in chapter 5, that the source of gains is unlikely to be expected synergies. Rather, the source of gains is more likely to be the release of new information to the market about the value of the target indicating the existence of information assymetries.

However, we found some evidence that combined firms in completed bids in the (-3, +2) period report total abnormal returns which are significantly higher than those of combined firms whose initial bidders failed and their targets were subsequently acquired by another bidder. This is a finding which indicates the existence of some kind of expected "unique synergies". As mentioned in chapter 5, unique synergies are expected to arise from a specific combination of bidder and target. When this combination fails to occur and another bidder acquires the target firm the market will envisage that these unique synergies will be lost. Furthermore, this event may also be perceived as a bidder's weakness and a strengthening of a rival's market position. Therefore, it is possible that both information asymmetries and some sort of expected synergies may explain the wealth gains created in takeover bids.

8.3 The determinants of wealth gains.

In chapters 6 and 7 we constructed a simultaneous equations system in order to find the determinants of wealth, mood and outcome. In chapter 7 we concentrated only on target companies using a sample of 238 completed and failed bids while in chapter 6 we examined bidding, target and combined firms using a sample of 178 completed bids.

If we want to summarise our findings regarding the

determinants of wealth gains from both chapters we can first say that we found some evidence of managerial and financial synergies. More specifically, we discovered that when targets with a low valuation ratio, which acts as a proxy for management efficiency, are taken over by bidders with a high valuation ratio then higher wealth gains for the shareholders of the targets and the combined firms are created due to the expected managerial efficiencies. Furthermore, financial synergies in the form of latent debt capacity of the target firm which increases the total debt capacity of the combined firm in the post-merger period seem to be a source of gains for the bidding and the combined firms. However, we did not find any sign of significant operational synergies thereby confirming our initial findings in chapter 5.

Second, we found that short-run factors explain better than long-run factors the wealth gains accruing to bidders, targets and the combined firms shareholders. The main short run factors are the mood, number of rival bidders and mode of payment. Other factors which proved to have an impact on the wealth created were the valuation ratio, bidder's toehold, large shareholdings, directors shareholdings in the bidding firm, size of bidder relative to target's and business cycles in the economy.

More specifically, hostile bids increase the gains of bidders and targets, because they are more likely to be disciplinary designed to replace inefficient managers and correct managerial failure. Thus, the gains made in hostile bids reflect the market's expectations about increased managerial efficiencies.

We also found that target companies with a low market valuation prior to the bid make higher wealth gains and bidders with a high valuation ratio make lower wealth gains. As explained in chapter 6, the first finding suggests the

existence of information asymmetries while the latter indicates bidder's overpayment due to the hubris effect.

Another factor which influenced the level of gains for target firms proved to be the mode of payment. We found that equity or mixed form offers give higher returns than pure cash offers. This finding is different from previous empirical evidence and although it can be explained by the uncertainty associated with the value of equity, we consider that it may be sample specific due to the very small number of cash offers in our sample.

Also, the bidder's toehold had a negative impact on target's wealth gains and the existence of rival bidders had a negative impact on bidder's gains as expected.

Examining the influence of the corporate share ownership variables, we found first, some limited evidence that large shareholdings by institutions or individuals reduce the size of target's and combined firm's wealth gains. This suggests the possibility that large shareholders have effectively performed their monitoring role prior to the bid. However, this is specific to the first sample of 178 completed bids; in the larger sample of completed and failed bids large shareholdings have no significant impact on the target's wealth gains and the monitoring role cannot be confirmed.

Second, we also discovered that although the target's directors shareholdings did not have any impact on target's wealth gains, the bidder's directors shareholdings examined in a non-linear form had a negative impact on the combined firm's gains. This suggests that the agency problem exists in bidding firms and when directors own a large fraction of shares they are more likely to make value decreasing acquisitions.

Finally, we showed that when a larger bidder acquires a

smaller target the target company makes higher wealth gains probably due to the ability of the bidder to afford to pay a higher premium. We also confirmed that the target and combined firms experience larger gains when the economy is expanding than when it is contracting.

8.4 The determinants of mood.

From the results obtained in the analysis made in chapters 6 and 7 we can conclude that the mood depends on the level of managerial ownership in the target firm, size of wealth gains, value of the target firm prior to the bid, mode of payment, relative size of bidder to target, degree of leverage of the target firm and industrial relatedness.

In particular, the level of managerial ownership proved to be the most significant variable in explaining the mood of bids. We found that hostile bids are expected when the level of directors shareholdings is low. Furthermore, we found that a low valuation ratio of the target firm increases the probability that the bid will be hostile. The above suggest that managers who hold a small number of shares are more likely to perform badly and this results in a decline of the firm's value and an increased probability of a disciplinary bid designed to replace the inefficient managers.

The probability of a hostile bid is increased when the wealth gains offered to target shareholders are high. This occurs because managers of target firms who receive disciplinary bids will attempt to resist them even if they offer higher wealth gains to the shareholders due to the fear of their replacement in the post-merger period. The positive relationship between wealth gains and mood confirms their mutual dependence justifying our use of a simultaneous equations system.

From the three relationsips discussed above it is clear that

the agency problem exists in target firms and the way it is mitigated is through the market mechanism of disciplinary bids. This is consistent with the **market for corporate control hypothesis.** Examining the sample of completed takeover bids we also found that the degree of the agency problem is limited by the presence of large shareholders. The large shareholders by monitoring the performance of managers in the pre-bid period increased the value of the firm but reduced the size of wealth gains to be made on the announcement month. Therefore, when large shareholdings are present the probability of the bid being friendly is increased. However, this result was only confirmed for the sample of 178 completed bids.

A significant role in explaining the probability of hostile bids was found for the mode of payment and the relative size of bidder to target. Thus, we detected first that cash offers are associated with hostile bids while equity offers are preferred by managers in friendly bids. Second, we found that when the size of the bidder increases the likelihood of target management resistance is reduced. Finally, we showed that a high level of gearing reduces the probability that the bid will be hostile but industrial relatedness has the opposite effect.

8.5 The determinants of outcome.

In chapter 7 we investigated the determinants of the outcome of a bid using a simultaneous equations framework. Our results showed that the mood, size of bid premium, bidder's toehold, level of managerial ownership, existence of large shareholdings and valuation ratio significantly explain the probability of success of a bid.

First of all, the mood of a bid plays a decisive role in determining its outcome. We found that hostile bids significantly reduce the probability of success. In order to

resist a bid, the management of target companies can use a number of defensive strategies, such as increasing the profit and dividend forecasts, seeking to find a white knight, making divestments and attempting to refer the bid to the Monopolies and Mergers Commission. In each case the cost to the bidder and the likelihood of subsequent abandonment of the bid are increased.

However, the level of bid premium is positively related to the probability of success because it gives an incentive for the shareholders of the target company to sell their shares and reap the associated wealth gains. This increases the supply of the shares to be sold up to the level required, so that the effective control of the target company will pass to the bidder. The same positive relationship was also found between the bidder's toehold and the probability of success. The more shares the bidder already owns the less shares are needed to be acquired in order to complete the acquisition.

Managerial ownership and large shareholdings play a significant role in determining the outcome of takeover bids. Thus, we discovered the existence of a non-linear relationship between directors shareholdings and the probability of a successful outcome. This relationship suggests that high levels of managerial ownership increase the probability of success probably due to the alignment of directors with the interests of the other shareholders. However, low levels of directors shareholdings reduce the probability of success. Large shareholdings had a negative impact on the probability of success and this contradicts the monitoring role of large shareholders which we reported for the sample of completed takeover bids. Thus, it seems that large shareholders tend to side with the group of managers who hold a low level of shares.

Finally, the valuation ratio of the target firm was discovered to be positively associated with the probability

of success suggesting that a firm which has been highly valued by the market for the quality of its management and investment opportunities is more likely to be acquired than a firm which has a low market valuation.

We can close this section by saying that the **directors interests**, the **valuation ratio** and the **mood** are the crucial factors not only for predicting the outcome of bids but also for detecting the agency problem and understanding how it is mitigated.

We found that the agency problem occurs when directors of target firms hold a low fraction of equity. Managers of these firms are not motivated to maximise the value of shareholder's wealth and consequently the value of the firm falls. As a result, the probability that the firm will receive a disciplinary and hostile bid is increased. However, at the same time the probability of success is reduced due to the various defensive actions that the target management can use to frustrate the bidder and cancel the bid. The final outcome and the solution to the agency problem will be determined by a number of other factors such as the size of the bid premium and the bidder's toehold. Thus, there is a trade-off between hostile bids and the outcome, because on the one hand hostile bids offer higher bid premia which in turn increase the probability of success but on the other hand hostile bids reduce the probability of success due to management's resistance.

Finally, it should be mentioned that due to the simultaneous equations approach adopted for the first time in a UK study examining the wealth effects, mood and outcome of bids we have been able to explore and explain more fully the agency problem and the mutual dependence between the wealth and mood variables.

8.6 Implications of our results.

In this section, we shall attempt to discuss briefly the implications of our findings for shareholders, managers and for government policy.

8.6.1 For shareholders.

First of all, since merger activity overall is value increasing companies should engage in it. However, the shareholders of bidding firms should find ways of monitoring better the merger plans of the management, since we found some evidence of value decreasing acquisitions which result in declining share prices. For example, one solution could be the introduction of a rule which would oblige the managers of these companies to disclose full information and advice provided by independent merchant banks regarding the proposed merger, so that shareholders, especially institutions, will be able to judge and vote accordingly.

Second, we found that hostile bids may be desirable because the shareholders of both bidding and target companies benefit. Hostile bids due to their disciplinary nature help to correct managerial failure and increase managerial efficiency. Nevertheless, this is a finding that it is based on an analysis measuring the average performance of companies and does not include all the cases. If hostile bids are motivated by speculative forces they may have a detrimental effect on shareholder's wealth.

Third, our findings suggest that the agency problem exists in both target and bidder firms-particularly the former-and moreover that it is induced by a low level of managerial ownership. This problem may be solved either by the mechanism of hostile bids or by the improvement of corporate governance in each firm.

In 1992 the British government set up the Cadbury committee which prepared a report aiming to fight financial fraud and

increase the efficiency of the system by which companies are directed and controlled. The main proposals of the report were first the separation of the role of the Chief Executive Officer (CEO) and the Chairman of the company who must be a non-executive director, second the requirement that at least three of the members of the board of directors must be independent non-executive managers appointed by the board and third the establishment of remuneration and audit committees. The report also recognised a very important role for institutional investors in appointing non-executive directors, exercising their voting rights and disclosing their policies. These recommendations of the committee for the improvement of the corporate governance system constituted the so-called Code of Best Practice. The code had no compulsory character but companies were encouraged to adopt it.

We consider that the enforcement of the code may reduce the agency problem to a limited extent and decrease the need for disciplinary bids. To the degree that managers are more effectively monitored by non-executive directors and institutional investors there will be less scope for disciplinary bids. This applies to target as well as bidding firms, because if the latter make value decreasing acquisitions they may eventually be in the position of receiving a hostile bid. However, if managers of bidding firms are effectively controlled they will be prevented from making bad acquisitions.

Nevertheless, the application of the Code of Best Practice is by no means a guarantee that the performance of inefficient managers will be monitored or that the agency problem will be eliminated. Although, it is too early for an assessment of the proposed changes, a recent empirical analysis by Hemmington Scott [**Jack (1993)**] shows that there is little correlation between long term corporate performance and the presence of non-executives or the

separation of the Chairman and CEO. Furthermore, as argued by **Renfield (1993)** the latter may be confusing as far as decision making is concerned and introduce higher costs because of the different salaries paid to the CEO and the Chairman of the companies.

Therefore, unless a complete transformation of the UK system of corporate governance is made to that existing for example in Germany, where institutional control through cross-shareholdings is performed, the role of disciplinary bids cannot be rejected. It is feasible, however, that the monitoring role of institutions and large shareholders could be enhanced and encouraged. The fact that in our sample the average percentage of large shareholdings is 21% for the target companies and 23% for bidding companies indicates how important the role of large shareholders may be in monitoring management performance. However, the results obtained from the sample of 253 completed and failed bids showed an ambivalent role for large shareholders. It was found that large shareholdings did not have any significant impact on the wealth gains but they had a significant negative impact on the probability of success. Therefore, there is a need for a more active participation of large shareholders in decision making as the Cadbury report suggests.

Another problem is created by the fact that institutional shareholders due to their different tax attributes may be more willing to sell than monitor the performance of their shares. A solution to this was recommended by **Peacock & Bannock (1991)** by introducing a tax neutrality among all kinds of investors, so that managers and individual investors will be encouraged to increase the level of their share ownership so that they will be motivated to maximise its value.

Given the importance of the level of managerial ownership in

our results we suggest that in addition to the recommendations of the Cadbury report, shareholders of both bidding and target firms should motivate or oblige managers to increase the level of their shareholdings up to an optimal level. Changes in the corporate charter can be implemented in a way that, for example, grants options to managers who achieve a certain level of corporate performance or make compulsory a mimimum level of share ownership. Managerial pay on the basis of performance related measures (e.g. bonuses) should also be encouraged further and the shareholders can be asked to express their views more frequently.

8.6.2 For managers.

We shall start our discussion from the bidding company attempting to show some practical implications of our results. First, since we found that takeover bids result on average in small losses for bidding firms shareholders and operational synergies do not exist managers should be reluctant to engage in takeover activity, unless they have a clear strategy regarding the proposed merger. They should also have carefully examined the benefits arising from the takeover and anticipated up to a certain degree the possible integration problems in the post-merger period including the diversity of corporate cultures.

Second, the bidder should offer a reasonably high bid premium in order to motivate target shareholders to sell their shares. However, while the price offered by the bidder should exceed the market value of the target firm it should not be higher than the expected value of the target firm in the post-merger period.

Third, if as it seems managerial synergies form one source of expected gains it follows that managers of bidding firms should try to find target companies which have been valued

at a low level by the market for management inefficiency. If the managers of bidding firms can distinguish which of these targets with a low valuation ratio have been truly underpriced by the market then when the incumbent management is replaced these companies can develop their full potential. However, this is a valuation problem which requires a good level of technical skills, experience, intuition and correct information.

Fourth, bidding companies should also look for targets with a latent debt capacity in order to realise the financial synergies which were found to be present in our analysis. A higher level of gearing can offer all the benefits associated with debt, such as tax allowances.

Fifth, the managers of bidding companies should attempt to gradually build a stake in the target company (bidder's toehold), so that the bid premium paid should be lower and the probability of success higher.

Sixth, as our results show the bidder must find targets in which the management owns a high level of shares, because in this case there is a higher probability that the bid will be friendly and the bid premia paid will be lower.

Finally, bidders should time mergers with a period of rising economic activity because in such times the market welcomes the bids and tends to evaluate them more positively.

If we look now at the target company we can note the following practical implications for their managers. First, target companies should show resistance, because the wealth gains will be higher. However, they have to be realistic about the level of bid premium demanded from the bidder if they want the merger to be successful.

Second, managers of target firms should attain a high level

of shareholdings since this would increase their personal wealth in hostile takeover bids.

Third, they should attempt to attract rival bidders and increase the degree of competition because in this case they may find a white knight who is willing to pay a higher premium than the others to acquire the target company. They should also attempt to negotiate with the bidder their retention in the management of the combined firm after the bid or higher compensation following their removal.

Fourth, our results suggest that managers should prefer a mixed form of payment, i.e. cash and equity and cash or equity, or even a pure equity offer rather than a pure cash offer. However, we are aware that due to the very small number of cash offers in our database these findings may be sample specific.

Fifth, managers of targets should time mergers in a period of boom in economic activity and should try to find bidders who are larger in terms of market value than them.

8.6.3 For government policy.

Before attempting to make some suggestions for government policy with respect to takeovers, we need to outline the main themes which form the current merger policy in the UK. The British government, especially under Mrs Thatcher's administration, has tended to follow a policy which has more or less encouraged the development of mergers and acquisitions. The main belief of this policy is that it is up to the shareholders of the companies involved to decide about mergers and that the market, being efficient, will be able to assess correctly which mergers are bad and which are good. As a result, government intervenes only in cases where competition is threatened.

As mentioned in chapter 1, in order to ensure that competition is not thwarted by mergers the Office of Fair Trading (OFT) examines each case of merger in which the market share of the combined firms exceeds 25% of the UK market and the value of the combined assets exceeds £30m [**MMC (1992)**]. Then, the Secretary of State for Trade and Industry decides on whether or not the case should be referred to the Mergers and Monopolies Commission (MMC). The MMC must decide within 3 to 6 months whether the merger should be allowed to go through or not. This decision is taken on the basis of **public interest** which is defined in terms of the trade-off between economic efficiency and competition. Under section 84(1) of the 1973 Fair Trading Act the definition of public interest also includes the examination of the effects of mergers on employment, development of new technologies, consumers interests and the activities of British multinational companies in domestic and overseas markets.

Thus, the decisions taken by the MMC are based on a number of factors with each case examined individually. This pragmatic approach of UK merger policy is very different from the US structural policy which applies strict guidelines determined by concentration ratios and price-based tests. The main concern and priority of US policy is the preservation of competition and hence many companies are prevented from making a bid which is likely to fall under the restrictions of the law.

Although, US policy is not as flexible as UK policy the cost-benefits analysis of the MMC can be expensive and time consuming, so that only a small number of mergers with a potentially adverse effect on competition are eventually referred to the commission. During the 1965-1985 period only 83 out of 14,081 mergers were referred to the MMC of which only 23 were blocked [**Peacock & Bannock (1991)**]. Nevertheless, if the UK government shifts the emphasis from

the costs-benefits analysis to the preservation of competition this will eventually limit its pro-merger policy and reduce the number of mergers accomplished.

In our case we did not examine the effects of mergers on competition, but our findings regarding the economic efficiency of takeovers give a less benign view than that expressed by the pro-merger policy of the government. Thus, although our results indicate that mergers overall are value increasing this is to be seen against a background in which bidder shareholders experience small losses. This further suggests the possibility of a transfer of wealth from bidding to target firms. If this is true then the government should try to find ways of protecting bidding firms shareholders from the abuse of managerial power which lead to a decrease of their wealth. One way of doing that is by the improvement of corporate governance as the Cadbury report suggests. As mentioned in an earlier section of this chapter the role of institutional investors and non-executive directors is crucial for applying the Code of Best Practice and minimising the agency problem.

Based on our evidence regarding the efficiency gains of takeovers we consider that the government should move from a pro-merger policy to a neutral approach as **Littlechild (1989)** has suggested. Another way of reducing the number of bids made could be, as argued by **George (1989)**, that bidding companies must give some proof that the proposed mergers are in favour of the public interest at least in terms of efficiency and competition. A careful and detailed estimation of any synergistic gains which are expected to materialise, will facilitate both the management, the shareholders of the companies involved as well as any other interested party to access better the real merits of the merger. In this way the interests of the bidding as well as the target firms shareholders will be protected and fewer value decreasing mergers will take place.

Second, we found no evidence of an increase in economic efficiency due to operating synergies. Thus, horizontal mergers which were assumed to generate economies of scale are no better than vertical or conglomerate mergers. In fact it was discovered that conglomerate mergers may offer higher wealth gains because of the financial synergies created. This suggests that conglomerate mergers should be encouraged. In this case there will be less danger for creation of monopolies and restrictions on competition.

Third, we found that contrary to previous empirical evidence hostile bids benefit both bidding and target firm shareholders. As argued above, this is explained by the argument that the motive behind hostile bids is to discipline inefficient managers when the internal control mechanisms fail to operate effectively. In this case, the gains made in hostile bids reflect the ex-ante correction of managerial failure. Therefore, in general hostile bids should not be discouraged. To the extent that the corporate governance becomes more efficient the need for hostile bids will be reduced. However, if this does not occur hostile bids provide a possible alternative solution. It should be emphasised however, that hostile bids of a disciplinary nature should be distinguished from hostile bids of a purely speculatory form which are not designed to improve the management efficiency of target companies.

If we want to conclude at this point we could say, that in general we accept the argument that takeovers constitute the device that the market exercises disciplinary control over inefficient managers. However, at the same time we suggest that a more cautious approach regarding the merger policy should be adopted by the government. If the interests of bidding and target firms shareholders can be better protected in other ways, there will be less need for hostile takeovers which constitute often an expensive solution to the agency problem.

Finally, it should be stressed that our thesis has been concerned with the issue of wealth gains captured by shareholders of bidding and target firms. However, we are aware that if we want to obtain a complete picture of the overall impact of mergers and acquisitions on the economy and society we have to broaden our inquiry to consider other important issues such as the effects of takeovers on **competition**, **consumers**, **employees**, **bondholders** and the **state**. These issues will entail the examination of the increase in market power and prices, the cost of redundancies and divestments made after the takeover, the transfer of wealth from debtholders to shareholders, the impact of takeovers on the long term investment plans, the tax savings and the impact that takeovers have on the level of risk for the economy as a whole. However, these topics are beyond the scope of our current research.

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