The Value Relevance of Capital Expenditures in the UK

Thesis submitted in accordance with the requirements of the University of Liverpool for the degree of Doctor in Philosophy.

By:

Issedeeq Othman Saadi

The University of Liverpool Management School

2005

Table of Contents

List of Tables and Figures

List of Appendices

Abstract

This study investigates the relationship between capital expenditures and the market value of firms in the UK. The intention is to establish the degree to which capital expenditures affect the firm value. In addition to cross-sectional and pooled analyses, this issue is also investigated in different sectors, in small, medium and large firms, in manufacturing and non-manufacturing firms and profit-making and loss-making firms.

The study employs cross-sectional valuation models. In the previous literature, cross-sectional valuation models have increasingly been used in the UK to investigate the value relevance of various accounting measures. For example, Green, Stark, and Thomas (1996), with respect to research and development expenditure; Rees (1997), with respect to dividends, debt and capital investment; Stark and Thomas (1998), with respect to residual income; and Akbar and Stark (2003b), with respect to dividends and capital contributions. This study also uses event study methodology to investigate the effect of capital expenditure announcements on stock returns.

Previous literature provides some evidence of the value relevance of capital expenditures. However, it is evident from the previous literature that first there is little research on this issue in the UK and secondly an investigation with cross-sectional valuation is worth doing, because only Rees (1997) has conducted this type of analysis. These points motivated the researcher to undertake such an investigation in the UK. This study intends to add to the existing limited literature in this area in the UK and hopes to shed further light on the relationship between capital expenditures and the market value of firms.

The valuation model used in this study is based on the valuation models used by Akbar and Stark (2003b). Cross-sections are constructed for each of the calendar years 1990 to 2003 and for pooled samples. This study employs Ordinary Least Square (*OLS*) with White's (1980) heteroscedasticity-consistent standard errors and covariance estimates. These techniques are used to mitigate coefficient biases and heteroscedasticity problems. Accounting and market data are extracted from Datastream. Announcements data are gathered from different sources: Financial Times, UK Activity Report and Regulatory News Services (RNS). The value relevance of capital expenditures is examined by running multi-regression techniques on cross-sectional and pooled samples.

The results highlight a positive and statistically significant association between capital expenditures and the market value of firms. It can therefore be argued that capital expenditures play a dominant role in the valuation of firms. In order to check the robustness of the results, we follow Akbar and Stark (2003b) and use four different deflators. No significant change was observed in the results for all four deflators. The sub-sample results suggest no role for size: however, some evidence was found to suggest a greater value relevance of capital expenditures in the manufacturing compared to the non-manufacturing sector. In addition, the value relevance of capital expenditures was found in both the profit-making and loss-making firms.

Declaration

I hereby declare that I am the author of this thesis, and no portion of this work referred to in this thesis has been submitted in support of an application for another degree or any other qualification of this University or any other University.

Issedeeq Saadi

2005

Copyrights

Acknowledgements

All praise and thanks are due to almighty Allah, the Most Gracious, and the Most Merciful for his help and guidance in achieving my goals. This work and the significance of my life would not be possible without him. I would like to express my sincere gratitude to my supervisor Dr. Saeed Akbar for his valuable suggestions, guidance, and encouragement and for all his time spent throughout the whole process. Without his help, encouragement and support, this work would have never reached this stage. My sincere thanks go to my dissertation examiners, Dr. Bernardo Batiz-Lazo and Dr. Kenbata Bangassa, for their valuable suggestions, comments and support.

I would like to express my thanks to all staff of the University of Liverpool Management School. I am grateful to my colleagues, Farid Ullah, Fakher Buferna, Abdalsalam Alkizza, Maqsood Qureshi, Joseph Wang, and Danis, for their support and help. Moreover, I would also like to express my thanks to the librarians of both Sydney Jones and Harold Cohen libraries of the University of Liverpool, the librarians of UMIST and Manchester Business School. I gratefully acknowledge the financial support provided by the Government of Libya during my doctoral study.

Special thanks go to my wife, Naima, for being there to tap my shoulders whenever I felt down towards my work, her support and encouragement were absolutely indispensable, her kindness, caring, and patience are truly above and beyond the call of duty; to my children, Maha, Abdolwahid, Malak and Duaa who serve as an inspiration for me to move on against all odds on my way. I wish to express my deepest thanks and appreciation to my parents, uncles and aunts, brothers and sisters, and all relatives and friends for their prayers, support, and encouragement during my studies.

Dedication

I Dedicate this Work

To

My Parents,

Wife

and

Children

Chapter 1

The Scheme of the Research

1.1 Introduction

This research project is concerned with the effect of new information on stock market prices. The central concern is to investigate empirically the information content of capital expenditures and other control variables.[1] It has long been accepted that in order to ensure their long-term survival, firms should have greater capital expenditures. In the last two decades or so, it has been argued that both at the macro and microeconomic level, capital expenditures play a significant role (Griner and Gordon, 1995). Capital expenditures also have been directly linked to firm value (McConnell and Muscarella, 1985).

Literature on capital expenditures focuses on two main areas: (i) the differences in market reaction as determined by the different features of both the firm and its capital investments (for example, Fazzari, Hubbard and Peterson (1988), Morck, Shleifer and Vishny (1989), Kerstein and Kim (1995), Blose and Shieh (1997), Chung, Wright and Charoenwong, (1998), Born and Ryan (2000) and Anderson and Garcia-Feijoo (2002), among others) and (ii) the manner in which stock markets react to capital expenditures announcements (McConnell and Muscarella (1985), Ambarish, John and Williams (1987), Woolridge (1988), Statman and Sepe (1989), Blackwell, Marr and Spivey (1990), John and Mishra (1990), Woolridge and Snow

[1] The control variables included in this study are book value, earnings, dividends, research and development expenditure, capital contribution and other information. In addition to the main concern of this research project, these control variables will also be considered.

(1990), Al-Qudah (1991), Aitken and Czernkowski (1992), Gobola and Tsetsekos (1992), Holland and Hodgkinson (1994), Rees (1997), Burton, Lonie and Power (1999), Bommel and Vermaelen (2003), Del-Brio, Perote and Pindado (2003), Brailsford and Yeoh (2004) and Kim, Lyn, Park and Zychwicz (2005), among others).

Previous research has investigated the relationship between capital investments and stock market prices in two groups of studies: one group of studies analyses the determinants of corporate capital expenditures and the other group examines the impact of announcements of a firm's planned capital expenditures on stock market prices. In the first group, for example, Fazzari, Hubbard and Peterson (1988) and Morck, Shleifer and Vishny (1989) suggest that the past stock returns and cash flow are important factors in predicting future capital investments. Specifically, firms tend to invest more when they have available cash flow or when their stock prices signal good investment opportunities.

In the second group, a number of studies have rigorously examined the effect of announcements of capital expenditure decisions on the market value of firms. McConnell and Muscarella (1985) examine the stock market reaction to capital expenditure decisions in the US. They find that announcements of increase (decrease) in capital expenditures lead to significant positive (negative) stock market returns. Blose and Shieh (1997) and Vogt (1997) find a significant positive relationship between the magnitude of stock market reaction to capital expenditure announcements and the level of new investment. Chung, Wright and Chareonwong (1998) conclude that announcements of increase (decrease) in capital expenditures positively (negatively) affect the stock market prices of firms with valuable

investment opportunities, but the opposite relation is found for firms without such opportunities.

In the light of the above discussion research on the value relevance of capital expenditures in the UK is very limited. Such an investigation is the main objective of this study. To investigate the value relevance of capital expenditures, cross-sectional valuation and event study methods are employed in this study. Cross-sections have been constructed on a sample of UK listed companies for the years 1990-2003.

The remainder of this chapter is outlined as follows. Section 1.2 discusses the objectives of the study. Section 1.3 explains the justification and scope of the study. Section 1.4 highlights the potential implications of this research project. Section 1.5 briefly presents the structure of the thesis and finally section 1.6 concludes the chapter with a brief summary.

1.2 Objectives of the Study

Previous studies attempting to investigate the valuation effect of non-earnings variables are generally restricted to a single item, such as book value, dividends, new equity issues or capital expenditures (for example, Bar-Yosef, Callen and Livnat (1996), Collin, Maydew and Weiss (1997), Collin, Pincus and Xie (1999) and Kim (2001), among others). The inconclusive and mixed results of these studies might be due to the insensitivity of the statistical tests to the valuation influence of individual items and to offsetting impacts ignored by the researchers. Therefore, one possible alternative is to develop and test a comprehensive (multi-item) adjustment mechanism (Lev (1989), among others).

Value relevance represents the association between the information impounded in the accounts and the information impounded by the market. In other words, value relevance shows the relationship between accounting data and market data such as the market value of firms. Previous research suggests that accounting data plays an important role in equity valuation (for example, Bowen (1981), Barlev and Levy (1981), Bowen, Burgstahler and Daley (1987), Ou and Penman (1989a, 1989b), Bernard and Stober (1989), Chauvin and Hirschey (1993), Ali (1994), Ali and Pope (1995), Bar-Yosef, Callen and Livnat (1996), Rees (1997), Barth and Clinch (1998), Garrod and Hadi (1998), Easton (1999), Barth (2000), Holthausen and Watts (2001), Barth, Beaver and Landsman (2001), Korthari (2001), Akbar and Stark (2003b) and Young and Oswald (2004), among others).

This study aims to investigate the relationship between capital expenditures and the market value of firms in the UK. Additional control variables: book value of equity, earnings, research and development expenditure, dividends, capital contributions and other information are also considered for such an investigation. The study also employs event study methodology to examine the impact of capital expenditure announcements on stock market returns. Event study method is one of the most common methodological approaches to market-based accounting research adopted to examine changes in share value/market volume occurring as a result of new accounting information.

The theory of corporate finance has traditionally maintained that corporate managers are faced with three major policy decisions: capital expenditure decisions, dividend (payout) decisions and financing decisions. A number of studies have investigated

the impact of corporate financing decisions on the market value of firms.[2] However, empirical evidence on the valuation effects of the announcement of capital expenditures decisions is relatively sparse. Such an investigation is the first objective of this study.

Existing literature on stock market reaction to capital expenditures concerns different sectors or groups. McConnell and Muscarella (1985) and Blose and Shieh (1997) focus on industrial and public utility firms. Woolridge and Snow (1990) and Livnat and Zarowin (1990) study small and large firms and find different results. Chan, Gau and Wang (1995) and Chung, Wright and Charoenwong (1998) distinguish between high and low-technology firms. Born and Ryan (2000) analyse the gas and oil industry. Kerstein and Kim (1995), Chambers, Jennings and Thompson (1999) and Kim, Lyn, Park and Zychowicz (2005) focus on manufacturing firms. Kim (2001) distinguishes between firms with positive (negative) earnings. In the UK, Al-Qudah (1991), Al-Qudah, Walker and Lonie (1991), Rees (1997) and Burton, Lonie and Power (1999) analyse all industrial firms. Most of these studies find significant differences between groups. In addition to cross-sectional and pooled analysis, this research project examines the value relevance of capital expenditures on different sub-samples. To do so, three different analyses are carried out: size-based analysis, and analyses of manufacturing versus non-manufacturing firms and profit versus loss-making firms. The main reason for conducting such an analysis is based on the argument that firms in different sectors have different characteristics to those in other sectors, which might affect the results.

---

[2] See for example, Aharony and Swary (1980), Brickley (1983) and Asquith and Mullins (1986) who examine dividend announcements, Scholes (1972), Kraus and Stoll (1972), Marsh (1979), Dann and Mikkelson (1984) and Sant and Ferris (1994) who examine new security issues, and Masulis (1980a) and Dann (1981) who examine common stock repurchases.

1.3 Justification and Scope of the Study

Existing literature on the valuation effect of capital expenditures seems to provide contradictory findings. An examination of the existing literature suggests that previous studies on the value relevance of capital expenditures provide inconclusive evidence. McConnell and Muscarella (1985) find different results for industrial and public utility companies. In the case of industrial firms, they suggest that announcements of increase (decrease) in capital expenditures lead to significant positive (negative) stock returns. For public utility firms, however, they report that announcements of capital expenditure decisions do not have any material effect on stock returns. Livnat and Zarowin (1990) provide evidence suggesting that cash flows from operating activities are strongly associated with stock returns. They suggest that the coefficients of cash flows from investing activities are generally insignificant. They also report that individual components of cash flows from financing activities are generally consistent with theories about information asymmetries.

In the UK, Al-Qudah (1991) investigates the impact of changes in the level of capital expenditures on stock market prices. He finds a positive relationship between capital expenditures changes and stock market prices. In another study, Al-Qudah, Walker and Lonie (1991) examine the accessibility and perceived usefulness of information relating to the capital expenditures plans of UK firms. They suggest that UK companies reveal information about their capital expenditure plans more regularly when the information is perceived to be useful to the investors, where additional finance is required and where the news is of an increase in capital expenditures. Rees (1997) examines an equity valuation model for investigating the value

relevance of dividends, debt and capital investment in the UK. He finds a strong role for capital expenditures in the market valuation of firms. Burton, Lonie and Power (1999) study the share valuation effects of individual real-asset investment project announcements and find significant positive returns for joint ventures but not for either of the other single company categories.

According to all the above-mentioned studies, it seems to highlight that there are conflicts and controversies on this issue which clearly suggest the need for more research in this area. The results obtained from most of these studies are mixed and ambiguous; for example, Livnat and Zarowin (1990) find no relation between investment cash flow and abnormal stock market returns while McConnell and Muscarella (1985) find a significant relationship between capital expenditures and stock market returns. Using UK data, the results of Burton, Lonie and Power (1999) about the market reaction to single-company capital expenditure announcements are inconsistent with the results in Al-Qudah (1991) and Rees (1997), who find that capital expenditures play a significant role in the market valuation of firms.

Overall, the results of all of the above-highlighted studies provide some evidence on the value relevance of capital expenditures. However, it is evident from the above that firstly there is little research on this issue in the UK and secondly an investigation with cross-sectional valuation models is worth doing, because only Rees (1997) has conducted such an analysis. These points motivated the researcher to undertake such an investigation in the UK.

1.4 Potential Implications

This study may provide useful indications to financial statement users on the value relevance of accounting information. The issue of the value relevance of capital expenditures will hopefully be resolved to some extent. Therefore, the findings might be useful to the standards-setting bodies, managers and investors. Overall, this study might expand the existing limited literature in this area in the UK and hopes to shed further light on the stock market reaction to capital expenditures decisions.

In addition, this study employs cross-sectional valuation models and return approach. The results provide evidence suggesting that capital expenditures play a significant role in equity valuation. Capital expenditures may have different valuation implications in different countries. The research framework adopted in this study could provide the basis for such a study to be performed in other countries.

This study also investigates stock market reactions to announcements of capital expenditure decisions and not to the outcomes of those decisions. Announcements are intended strategies that can either be realised or unrealised and may be modified during implementation (Mintzberg and Waters (1985)). It would be helpful for future researchers to track a set of announced decisions, determine the outcomes of those decisions and attempt to assess when and how much market valuation changed.

The additional analysis based on different sub-samples may also suggest future research possibilities. In this study, the sample is split into different sub-samples, first, small, medium and large firms, second, manufacturing and non-manufacturing firms and third, profit and loss-making firms. The splitting of the sample could be

done in other sub-samples and in different ways, such as industrial versus public utility firms and high versus low-technology firms.

1.5 Structure of the Thesis

The remaining part of this research project is organised as follows. Chapter 2 presents a review of previous literature related to this study. Certain issues are illustrated and gaps are identified in the relevant literature. Chapter 3 describes the research methodology. The chapter provides a brief summary of the valuation models used in this research. There is a discussion on the econometric issues and some remedies for these issues. The chapter also provides a brief discussion on the event study method and statistical tests. There are also discussions on different sub-samples and finally, a brief summary is presented at the end of the chapter.

Chapter 4 highlights the process of sample selection and data description. The process of deleting companies due to missing data, outliers or for any other reason is discussed and reported. The chapter also describes details of the announcement data in a separate section. Variable definitions are also given in this chapter and lastly, a brief summary is presented at the end of the chapter.

The first empirical chapter of the thesis is Chapter 5. The purpose of this chapter is to investigate the value relevance of capital expenditures. There is a brief summary of the relevant literature, which briefly describes the findings of previous research and provides insights into the research techniques used in this research. There is a brief discussion of the research approach. There is also a discussion of the results of the analysis presented in the sub-sequent tables, and finally, a brief summary is presented at the end of the chapter.

Chapter 6 examines the effect of capital expenditures announcements on the stock market prices surrounding the announcement date. The chapter briefly highlights the relevant previous literature. There is a discussion of the research approach. The chapter also provides a brief discussion of the findings. Finally, a brief summary is also provided at the end of the chapter.

Chapter 7 investigates the value relevance of capital expenditures in different sectors. There is again a brief summary of the relevant literature. The process of reorganising and rearranging the sample into different sub-samples is also highlighted. There is also a discussion of the research approach. Results are reported for three different analyses: size-based analysis, and analyses of manufacturing versus non-manufacturing and profit versus loss-making firms. A discussion of the results is also presented. Finally, a summary of the main findings is given in the last section.

The final chapter of the thesis is Chapter 8. It summarises all the results and findings discussed in the empirical chapters. It also highlights the main contributions to the existing literature in this area in the UK. The chapter concludes the thesis by suggesting the possible implications of the findings. It also reports some limitations of the study, and finally, provides a discussion of some new ideas for future research.

1.6 Summary

This chapter presents a brief commentary on the study. It discusses the research issue, research purposes, motivation and justifications. It also describes the organisation of the thesis by providing brief notes on each chapter. The following chapter presents a review of the relevant literature, highlighting the main research approaches and the main findings of previous research.

Chapter 2

Review of the Literature

2.1 Introduction

This chapter reviews studies that contribute to an understanding of the relationship between the information content of reported financial statements and stock market prices. The main concern is with studies using information in balance sheets, profit and loss accounts and cash flow statements to infer the value or the change in value (returns) of common stocks.

The chapter presents a survey of relevant contributions to the literature on the association between capital expenditures and the market value of firms. The chapter has two main purposes. The first purpose is to investigate the relationship between capital expenditures and the market value of firms from a theoretical point of view. The second purpose is to review studies which concentrate on the implications of financial theory for the relationship between capital expenditures and the market value of firms. There is a general assumption that accounting information is relevant for valuing securities, evidenced by the extensive analysis underlying broker recommendation. There is an extensive amount of literature in market-based accounting research which links accounting information to share prices; however, studies on the value relevance of capital expenditures are limited.

The remainder of the chapter is outlined as follows. Section 2.2 discusses stock market reaction to accounting information. Section 2.3 presents the information content of some financial signals: dividends, security issues and debt. Section 2.4

highlights firm valuation theories. Section 2.5 discusses previous studies that highlight the stock market reaction to capital expenditures, and finally, section 2.6 concludes the chapter.

2.2 Stock Market Reaction to Accounting Information

In the four decades to 2005, the usefulness of accounting information has been a topic of increasing interest. The ability of accounting and financial variables to explain stock market values (returns and/or prices) has been under investigation since the seminal work of Beaver (1968) and Ball and Brown (1968). These studies are being the first to introduce this issue into the accounting literature. Beaver (1968) shows that the market reacts with increased trading volume and increased price variability in the week of the earnings announcement. Ball and Brown (1968) examine the association between accounting variables and stock market returns. They document that earnings increases (deceases) are associated with positive (negative) abnormal stock returns over the 12 months before the earnings announcement. Abnormal returns involve actual returns and expected returns. Actual returns for any period are defined as the difference in prices between the end and the beginning of the period adjusted for dividends and other factors that may affect the shareholding (Woolridge and Snow (1990), among others). These results can be summarised as: the unanticipated component of earnings tends to have the same sign as unanticipated price changes.

In the last two decades, many studies[3] have emphasised the relationship between the new information concerning earnings and the market reaction to this information, as

---

[3] See for example, Basu (1977, 1983), Ball (1978), Beaver, Lambert and Morse (1980) and Beaver, Lambert and Ryan (1987), among others.

in Beaver (1968), or the association of new information and the abnormal component of returns, as in Ball and Brown (1968). This information perspective, which has continued to effect research methods in the last ten years, may be described from an investor, a user or a finance perspective that views accounting as a source of information for use (either actual or potential) in investment decisions.

Beaver and Dukes (1972) examine the relationships between accounting earnings and stock market prices. Blume and Friend (1973) and Friend (1977) indicate that investors base their capital expenditure decisions mainly on accounting data. Barlev and Levy (1981) argue that accounting data are widely used by investors in the process of managing their security portfolios. Ball and Brown (1969), Pettit (1972), Beaver and Manegold (1975), Lipe (1986), Lev (1989), Lip (1990), Rauh (1990), Penman (1992), Lev and Thiagarajan (1993), Green, Stark and Thomas (1996), Rees (1997), Stark and Thomas (1998), Garrod and Hadi (1998), Easton (1998), Lee (1999), Easton (1999), Lev and Zarowin (1999), Barth (2000), Holthausen and Watts (2001), Kothari (2001) and Akbar and Stark (2003b), among others, examine the association between stock market prices and various accounting variables. Most of these studies document a significant role for accounting information in market valuation of firms.

Among the above-mentioned studies, Lipe (1990) investigates the relationship between stock market returns and accounting earnings. He concludes that the stock market return during a period is a function of (i) the time series persistence of the earnings series, (ii) the interest rate used in discounting expected future earnings and (iii) the relative ability of earnings versus alternative information to predict future earnings.

Rauh (1990) argues that the single most significant financial measure of the health of any company is its operating cash flow. He further argues that cash flow is an important factor to the lender because it represents the funds available to assist in debt repayment and to finance capital expenditures. It can be argued that accounting data plays some roles in changing the expectations of users and ultimately results in the increase or decrease in stock market prices.

Penman (1992) states three features of accounting which form the basis of its potential role in equity valuation, first, it has the nominal attributes of a value measurement system, second, it is a disciplined system for reporting phenomena (transactions) that is bound by rules that produce a value-added number that is independent of dividends: the calculation of earnings does not include dividends, and third, accounting information has a connection to future dividends.

Lee (1999) states that accounting systems play at least three important roles in stock market valuation, *first, they provide a language for forecasting, second, accounting systems provide helpful information for forecasting future payoffs to shareholders, and third, accounting systems serve as an ex post setting-up mechanism, because today's analysts' earnings forecasts are compared to the actual (and audited) earnings reported in the future* (p. 414).

Easton (1999) describes the role of accounting information as capturing the effects of economic outcomes with lag. He argues that at any point in time, price reflects all returns since the firm came into existence, while book value represents all accounting measures of change in value (earnings) during this period. Book value will reflect the cumulative effect of accounting reporting lag – some of the value-relevant events

observed by the market (and therefore captured in returns) in early years will be included in accounting earnings of later years, but some will remain unrecorded in book value. It can be argued that accounting information may be regarded as a summary of the events that took place during the period and which have affected the firm value. All the above-mentioned properties highlight a potential role for accounting information in equity valuation.

2.3 Financial Signalling

A number of recent contributions to the academic literature have developed theoretical models in which managers can use financial policy decisions to convey information about the firm's investments to the capital markets. Financial policy decisions may act as signals of the size of or the change in the dividend paid and securities issued, the level of debt chosen and capital expenditures. These financial policy decisions are briefly discussed below.

2.3.1 Dividend Signals

Previous literature has found a significant, positive relationship between the dividend announcements and stock price movements caused by the information content of dividends that management conveys to the market through announced changes in dividend policy (for example, Miller and Modigliani (1961), Pettit (1972, 1976), Watts (1973), Gonedes (1978), Aharony and Swary (1980), Eades (1982), Asquith and Mullins (1983), Brickley (1983), Woolridge (1983), Dielman and Oppenheimer (1984), Kalay and Lowenstein (1985), Miller and Rock (1985), Ambarish, John and Williams (1987), DeAngelo, DeAngelo and Skinner (1992), Lonie, Abeyratna, Power and Sinclair (1996), Rees (1997) and Akbar and Stark (2003b), among

others). The information content of a dividend has become known as the dividend information hypothesis. Miller and Modigliani (1961) examine the effect of the information content of dividends. They assume that outside investors and inside managers have the same information about the firm's current earnings and future opportunities. They demonstrate that under conditions of perfect capital market and zero taxes, dividend payout rates (i.e., dividends paid out of earnings) do not affect the value of the firm. They point out that dividends may have information content if managers have better information about the firm's future earnings and use that information to set current earnings. They argue that when a firm adopts a policy of dividend stabilisation, investors are likely to interpret a change in the dividend payout rate as a change in the management's views of the firm's future profitability. Watts (1973), Gonedes (1978), and DeAngelo, DeAngelo and Skinner (1992) provide evidence consistent with this theoretical work.

Watts (1973) examines the hypothesis that dividends convey information about future earnings in the US. He finds a positive but weak relationship between future earnings changes and prior unexpected dividend changes. He also finds some relationship between unexpected dividend changes and abnormal returns. Gonedes (1978) reports no support for dividends or extraordinary-item information beyond that reflected in contemporaneous income signals. DeAngelo, DeAngelo and Skinner (1992) investigate the relationship between dividend reductions and poor earnings performance firms. The results indicate that firms that report an annual loss have a significantly higher probability of a dividend reduction and these firms are more likely to reduce dividends the greater their current loss and the greater their future earnings problems. It can therefore be argued that the information content of dividends will vary depending on the characteristics of current earnings.

Many empirical studies have documented a significant positive relationship between the dividends changes announcement and stock market prices. Among these studies, Pettit (1972, 1976) is the first to confirm that changes in dividend levels convey information to market participants, following Lintner (1956), who concludes (at least for large firms) that firms tends to increase dividends when their future cash flows are sufficient to support the higher rate of payment and tend to decrease when future cash flow are insufficient to support the present dividend rate.

Aharony and Swary (1980) investigate the incremental information content of dividends relative to earnings in the US. They use quarterly earnings per share and quarterly cash dividends per share including extra dividends. The sample consists of 149 industrial firms. The study covers a time period of 14 years (1963-1976). They divide their sample into three sub-samples, no change in dividends, increases in dividends and decreases in dividends. The results indicate that the firms in the no change in dividends group earned, on average, only normal returns. They further find a positive (negative) relationship between the dividend increase (decrease) and abnormal returns over the twenty days surrounding the announcement date. Brickley (1983), Dielman and Oppenheimer (1984), Kalay and Lowenstein (1985), Miller and Rock (1985) and Ambarish, John and Williams (1987) suggest evidence consistent with those offered by Aharony and Swary (1980). All these studies document positive (negative) abnormal returns at the announcements of dividend increase (decrease).

Brickley (1983) examines the effect of dividend policy on shareholders' wealth. Their results suggest that management uses the labelling of dividend increase to convey information to the market about future dividends and earnings. The results

also highlight that the increase in dividends lead to positive abnormal returns and the decrease in dividends lead to negative abnormal returns. Dielman and Oppenheimer (1984) investigate investor behaviour around dividend announcement dates. They report positive and significant abnormal returns on the day of announcements and the day after announcements. Their results suggest positive abnormal returns for the dividend increase and negative abnormal returns for the dividend decrease.

Kalay and Lowenstein (1985) study whether abnormal returns over an event period reflect the higher compensation that risk-averse investors require to hold the asset over a riskier period in the US. In other words, they assume that the risk per unit of time and the required rate of return are higher than normal during an event period whose timing can be predicted. They present empirical evidence indicating that the unconditional mean rate of return, the variance of stock returns and their systematic risk are higher than 'usual' during dividend announcement period. Their results suggest that announcements of dividend increase (decrease) are associated with positive (negative) abnormal returns. Miller and Rock (1985) extend the standard finance model of the firm's dividend, investment and financing decisions by allowing the firm's managers to know more than outside investors about the firm's current earnings. The results suggest that dividend changes are positively associated with security returns. They argue that the association between market reaction and cash flow components is likely to be mixed.

Woolridge (1983) examines the impact of unexpected dividend changes on the value of common stock, preferred stock and bonds in the US. The study investigates the signalling and wealth transfer hypotheses. A wealth transfer among different classes of securities is one of several hypotheses used to explain stockholder gains on the

announcement of dividends. The sample consists of 811 observations: 367 for common stock, 151 for preferred stock and 293 for bonds. The study covers a time period of 8 years (1970-1977). The results suggest that the primary factor influencing stock market returns in response to dividend changes is market signalling. He argues that dividends under certain conditions may result in wealth transfers between debt and equity holders. For example, if a firm finances an unexpected dividend payment with additional debt or by reducing investment, a wealth transfer among different classes of securities may result. These results have been confirmed by Handjinicolaou and Kalay (1984), while Dhillon and Johnson (1994) find opposite results.

Lonie, Abeyratna, Power and Sinclair (1996) investigate stock market reaction to the dividend announcements of UK companies. The study investigates the relationship between dividends and earnings to determine whether an interaction effect exists between dividends and unexpected earnings. The sample consists of 620 companies during six months, January to June 1991. They use event study methodology as the research methodology. An event study method is a technique which examines the changes in share value/market volume occurring as a result of new accounting information normally using shot windows. To isolate the dividend announcements from the earnings announcements, they divide their sample into six groups according to the good and bad news in dividend and earnings. Their results indicate that the good news companies earned positive abnormal returns, while the bad news companies had negative abnormal returns. Using regression techniques, the results indicate that both variables influenced the level of abnormal return and that current earnings are the dominant signal, with the dividend announcement a partial and often inferior source of information to investors.

Rees (1997) investigates the value relevance of dividends, debt and capital expenditures in the UK. Data for this study is extracted from the *Financial Company Analysis Service* (*EXTEL*). The study covers a time period of 9 years (1987-1995). In order to analyse the value relevance of dividends, ordinary earnings are partitioned into ordinary dividends and retained earnings. He finds that dividends have a stronger association with market value than retained earnings. In addition, he finds some evidence suggesting a negative relationship between debt and the market value of firms.

Akbar and Stark (2003b) investigate the impact of dividends and capital contributions in empirical models of corporate valuation in the UK. Their data is extracted from Datastream for the financial years ending in the calendar years 1990 to 2001. They report a positive and significant relationship between dividends and market value of the firm and they also report a negative relationship between capital contributions and market value of the firm. They argue that if dividends are included on their own, they have a positive effect on market value whereas, if they are combined with capital contributions, the net figure, net shareholder cash flow, has a negative effect.

2.3.2 Security Issues, Debt and Capital expenditures Signals

Empirical literature on corporate finance finds that corporate financing and capital expenditures decisions are often associated with price adjustments in firms' securities (Masulis and Korwar, 1986). One of the first to examine the use of debt to mitigate the information gap between managers and outside shareholders is Ross (1977) and Leland and Pyle (1977). Ross (1977) demonstrates that the nature of a

firm's investment policy can be signalled to the market through its capital structure. In his model, the level of debt acts as the signal, the higher the gearing the greater the confidence management have in the size of future cash flows from a project. In addition, management will always choose the correct level of debt to signal their information to the market since any false signalling will result in a loss of compensation for managers.

Leland and Pyle (1977) investigate management ownership from a diversification standpoint. In their model, the amount of the project financed by the entrepreneur (manager) may provide a signal to financial markets about the quality of any project to be undertaken. A conclusion of their model is that the smaller the amount of new equity issued to outside shareholders when financing a project, the more credible the signal emanating from management. It is generally regarded as risky for managers to hold a large fraction of a firm's ownership. Thus, managers have incentives to hold large stock positions only if they expect the future cash flows to be high relative to the firm's value or that the projects they are investing in are sufficiently profitable. Rational investors will consider managers' fractional ownership to be a credible signal of firm value. Issuing new equity reduces managers' ownership fraction and therefore can be interpreted by market participants as conveying negative information about firm value. Hess and Frost (1982), Masulis and Korwar (1986) and Kalay and Shimrat (1987) provide empirical evidence consistent with Leland and Pyle (1977).

Hess and Frost (1982) examine the reaction of common stock prices to new issues of seasoned securities. They report negative abnormal return around the time of new equity issues. Masulis and Korwar (1986) investigate adjustments to stock prices

following the announcement of underwritten common stock offerings. The results suggest a significant fall in the value of common stock on the announcement of primary and combination stock offerings and dual debt-common stock offerings. Kalay and Shimrat (1987) examine stock market price behaviour around announcements of new equity issues. The results indicate that stock market prices react negatively to the announcement of new issues of equity. All these results are in accord with the hypothesis that the market interprets equity issues as conveying negative information about the issuing firms.

Trueman (1986) considers the possibility that management may be able to use real variables, namely the level of investment, instead of financial variables (i.e., firm's dividend policy) to signal their information when they need to raise external capital to finance an investment project. He shows that the level of capital investment might be able to perfectly reveal management's information, with a higher input level of capital investment signalling more favourable information. Empirical evidence consistent with this conclusion is provided by McConnell and Muscarella (1985), Woolridge and Snow (1990), Al-Qudah (1991) and Assiri (1993), among others, who suggest that announcements of increase (decrease) in capital expenditures are associated with significant positive (negative) abnormal stock returns. It can therefore be argued that managers seeking to maximise the market value of the firm in making their firm's capital expenditures decisions.

In the light of the above-mentioned studies, it can be argued that there are theoretical and empirical evidence supports the response to corporate capital expenditure announcements as being consistent with the prediction of the market value maximisation hypothesis. Managers invest up to the point where the marginal rate of

return on invested funds just equals the market-required rate of return. It is predicted that an unexpected increase (decrease) in capital expenditures should then be accompanied by an increase (decrease) in the market value of the firm.

Much of the previous analysis has assumed that the objective which management chooses to follow is the maximisation of shareholders' wealth. Myers and Majluf (1984) raise the question, which variant of shareholders' wealth should management seek to optimise? They attempt to answer this question by considering the association between the firm's capital spending and its market value under three different scenarios.[4] First, management may choose to act in the interest of all shareholders and ignore any difference of interest between old and new shareholders. Second, management may decide to act in the interest of existing shareholders and presume that these shareholders follow an inactive capital investment strategy. These shareholders do not rebalance their portfolios in response to the firm's announced investment-financing decisions. Third, management may consider that old shareholders follow an active capital expenditures strategy and rebalance their portfolios as a consequence of the firm's action. Under this scenario, managers are again assumed to act in the interest of existing investors. It can therefore be argued that these objectives lead to a different capital expenditures decision and involve a different empirical association between the firm's capital expenditure decisions and its market value.

Myers and Majluf (1984) argue that, even in an asymmetric information setting, if a firm's management maximise all shareholders' wealth, they will follow the practice

---

[4] There are other objectives that management may follow: for example, the management may intend to maximise growth, because their firm's reward structure is linked to this objective (Marris, 1963), or sales, for a similar reason (Baumol, 1962). Koutsoyiannis (1984) provided a thorough review of the type of objectives that management may pursue.

of accepting every positive net present value (*NPV*) project. By doing so, the market value of the firm will, on average, continue to be correctly priced, as in the symmetric information case, and insider information will only form a 'side bet' between old and new investors. It can therefore be argued that the decision to invest by the firm should increase stock market price (or leave it unchanged)[5] because the decision to invest would notify the market of the survival of an attractive project and this is considered as good news.

However, the literature in this research area generally assumes that managers' interests are closer to the interests of existing shareholders than to those of the new shareholders. If this is the case, the expected association between the market value of the firm and its capital expenditures decisions will be different from that expected under the previous scenario and will depend on whether the management consider that old shareholders are inactive or active investors.

If, on the one hand, the managers believe that it is in their interest to maximise the wealth of existing investors and these shareholders do not rebalance their portfolios, the Myers and Majluf (1984) model would seem to predict that a decision to increase investment will lead to an increase in stock market prices if new investments are financed internally, while, if the firm has raised external funds, which are relatively risky and convey unfavourable signals, an increase in investment will cause a decrease in stock market prices. Internally financed investment, therefore, will be considered as good news while externally financed investment will be regarded as a bad signal.

---

[5] Notice that it is predicted that the stock market price change should happen when the opportunity to invest occurs and the decision to undertake it is made and not when the actual capital expenditure takes place.

If, on the other hand, managers aim to maximise the stock value of existing shareholders and believe that these shareholders follow active capital investment plans, then the decision to undertake an internally financed investment will be considered as good news. However, if the capital investment strategies are financed externally, the impact will be difficult to determine, in part due to the market perhaps reacting less favourably to the use of equity than to the use of debt.

Since outside investors understand that the firm's management knows more about the expected returns from the capital expenditures and that managers may use such information on behalf of the existing shareholders, new investors may discount the firm's announcement of an expected positive (*NPV*) capital investment plan. On the other hand, managers may understand that investors will be uncertain of their actions and seek to assure potential shareholders of their purposes through some signalling mechanism. The association between the firm's capital expenditures and its market value therefore depends on the reliability that the market attaches to this signal.

2.4 Firms' Valuation Theories

2.4.1 The Traditional Valuation Approach

Miller and Modigliani (1961) argue that investment with positive *NPV* would increase the value of a firm. They say … *no proposed project would be in the interest of the current owners if its yield were expected to be less than market value rate of return since investing in such projects would reduce the value of their shares. In the other direction, every project yielding more than the market rate of return is just as clearly worth undertaking since it will necessarily enhance the value of the*

enterprise. Hence the cost of capital or cut-off criterion for investment decisions is simply market rate of return (p. 418).

Fama and Miller (1972) highlight that under certain simplifying assumptions, including perfect market conditions[6]; the firm's financial decisions are irrelevant to the market value of the firm, given its investment decisions. They demonstrate that a firm can affect the wealth of its security holders only through changes in its real productive assets. Under these assumptions the objective of the firm can be represented as one of maximising the net present value (*NPV*) of its anticipated cash flows. To satisfy this objective management should invest until the present value of the marginal cash flows equals the initial purchase price of a unit of capital. This concept is known in the literature as the net present value rule.

The basic premises of the net present value rule under perfect market conditions in which all market participant are price takers have been rigorously examined by Fama and Jensen (1985). They argue that in this case shareholders will agree that any decision which has a future payoff, including investment decisions, should be evaluated according to its contribution to the current market value of their residual claims; this argument implies that any change in a firm's capital expenditures plans should lead to a parallel change in its market value.

More specifically, traditional valuation theory, which is argued by Miller and Modigiliani (1961) and Fama and Miller (1972) states that industrial firm projects with positive *NPV* will lead to positive abnormal returns and projects with negative

---

[6] Specifically, their assumptions included a prefect market with no transaction costs, no taxes, no agency costs of equity and no bankruptcy costs; individuals and firms have equal access to capital market; information is costlessly available to all market participants; and only wealth affects the firm's investment strategy.

NPV will lead to negative abnormal returns. However, projects with zero *NPV* (such as public utilities) will have no effect on the value of the firm (McConnell and Muscarella (1985) and Blose and Shieh (1997), among others).

McConnell and Muscarella (1985) state that ... *traditional valuation theory posits that the market value of the firm is equal to the discounted value of future earnings expected to be generated by assets already in place, plus the discounted net present value of investment opportunities that are expected to be available to the firm in the future* (p. 400). Woolridge and Snow (1990) argue that the value of the firm changes due to the release of information that changes the stock market's expectation about the cash flows from current and future assets. They further argue that in an efficient market, this response indicates the market's evaluation of firms' decisions: to separate the effect of a particular firm's announcement, its stock return must be adjusted for the expected return on the stock market. Brealey and Myers (2003) argue that the market value of the firm is: (i) the sum of the expected discounted value of future cash flows from existing assets; and (ii) the net present value (*NPV*) of expected cash flows from investment opportunities that are expected to be undertaken by the firm in the future.

According to the discussion above, a firm's market value should equal the discounted value of the future cash flows generated by its existing assets plus the net present value of its future investment opportunities. Theory therefore suggests that a change in capital expenditures plans should lead to a corresponding shift in the firm's stock market value.

2.4.2 The Shareholder Value Maximisation Approach

McConnell and Muscarella (1985) argue that managers invest up to the point where the marginal rate of return on invested funds equals the market-required rate of return. The empirical view is that an unexpected increase in capital expenditures should increase the market value of the firm and an unexpected decrease in capital expenditures should decrease the market value of the firm. In other words, an increase (decrease) in capital expenditures should have a positive (negative) impact on the market value of the firm.

Woolridge and Snow (1990) investigate the relationship between capital expenditures announcements and stock market prices in the US. The results suggest a significant relationship between capital spending and the market value of firms. They argue that the shareholder value maximisation theory states that the stock market reacts positively to corporate announcements of strategic investment decisions. Their empirical results strongly support the shareholder value maximisation hypothesis.

Recent financial theory argues that managers are forced by the capital market to make capital expenditures decisions to maximise a firm's value (Fama and Jensen (1985) and Rappaport (1986), among others). The shareholder value maximisation theory predicts that the stock market will react positively to the announcement of capital expenditures decisions and such a decision increases a firm's value by enhancing its ability to generate future cash flow (Woolridge and Snow (1990), Burton, Lonie and Power (1999) and Del-Brio, Perote and Pindado (2003), among others).

2.4.3 The Size Maximisation Approach

McConnell and Muscarella (1985) state that the size maximisation hypothesis is the prime challenger to shareholder value maximisation, where managers seek to increase the size of the firm. Therefore, they invest beyond the point where marginal return equals the market-required rate of return. This approach predicts that an unexpected increase (decrease) in capital expenditures should have a negative (positive) effect on the market value of firms. The empirical findings of McConnell and Muscarella (1985) are inconsistent with the size maximisation approach, but consistent with the shareholder value maximisation hypothesis.

2.4.4 The Institutional Investor Approach

The institutional investor theory is the opposite of the shareholder value maximisation theory. It has been argued that investors basically focus on quarterly earnings and that this discourages managers from seeking strategies aimed at long-term competitive advantage (Ellsworth (1985), among others). Managers dissatisfying institutional investors by refuting quarterly earnings will cause a decrease in their stock market prices. This may result in facing the threat of a takeover from corporate raiders (Woolridge and Snow, (1990). The institutional investors approach predicts a negative reaction to the announcements of capital expenditures decisions (Woolridge and Snow (1990), Burton, Lonie and Power (1999) and Del-Brio, Perote and Pindado (2003), among others). Therefore, this approach predicts that announcements of corporate capital expenditure decisions with long-term, uncertain payoffs will be associated with negative stock market returns.

In the last ten years, managers have been urged to make investment decisions that improve the long-run competitiveness of their firms (Hayes and Abernathy (1980), among others). Woolridge and Snow (1990) argue that managers claim that the stock market is the biggest obstacle to long-run or strategic decision-making. As a result, they are forced to undertake short-term projects in order to satisfy the demands of the stock market.

2.4.5 The Rational Expectations Market Approach

Woolridge and Snow (1990) argue that in this approach, the market will not respond quickly or strongly to the announcement of capital expenditure decisions. The logic, they claim, is that competitive advantage across industries, firms and strategic decisions is transitory and if the announcement creates negligible stock returns, *it would appear that investments serve to maintain competitive fitness rather than generate competitive advantage* (p. 355). A firm can gain competitive advantage, for example, by becoming the low-cost producer, differentiating its product or service, and/or situating itself as a profitable link in an industry's value chain (Porter, 1980). Competitive advantage form barriers to potential entrants and results in an imperfectly competitive industry in which strategic investment decisions with positive *NPV* are possible (Shapiro (1985), among others).

The rational expectations market approach assumes that investors anticipate and impound into stock prices the same net present value (*NPV*) that managers anticipate before capital expenditures are announced (Burton, Lonie and Power (1999)). The rational expectations approach predicts that any potential impact of capital expenditure announcements has already been impounded in stock market prices

(Del-Brio, Perote and Pindado (2003)). It can therefore be argued that there is no stock market reaction related to the rational expectations market approach. It follows that by the time of the actual announcement, stock values have already captured all future net benefits.

2.4.6 Discussion

Previous section has discussed briefly the five main theories of the valuation of firms. The overall conclusion strongly supports the shareholder value maximisation hypothesis. When corporations announce their capital expenditure decisions, the stock market usually reacts quickly and positively. This means that the stock market rates companies on the basis of their capital expenditure decisions. In other words, the more a company invests, the higher the stock market returns that can be generated. This is supported by the conclusions drawn by McConnell and Muscarella (1985) and Woolridge and Snow (1990), which strongly suggest a significant association between capital expenditures and the market value of a firm. In addition, managers can play with capital expenditures in order to determine the value of the firm.

2.5 Capital Expenditures and Firm Value

2.5.1 Capital Expenditures and Firm Value in the United States

A capital expenditures decision is one of the most important financial decisions (dividend payout, debt levels and capital expenditures) that a firm makes. It plays a significant role in increasing a firm's value or size. Shareholders are normally more concerned about the market value of the firm and expect capital expenditures to

increase the firm value. The role of capital expenditures has been the subject of previous accounting research. Greenball (1971) and Elliott and Uphoff (1972) are examples of early attempts to examine the stock market reaction to capital expenditures decisions. Recent studies derive predictions of the effect of capital expenditures on stock market prices.

The seminal study in the area of the valuation effect of capital expenditure announcements is McConnell and Muscarella (1985). They investigate the value relevance of capital expenditures. The study covers a time period of seven years (1975-1981). Data for this study is obtained from *Wall Street Journal Index*. They categorise capital expenditure announcements into four groups: (1) announcements that indicate an increase from the previous year's budget; (2) a decrease from the previous year's budget; (3) an increase in the current year's previously announced budget; and (4) a decrease in the current year's budget. They identify 658 capital expenditures announcements. They split their sample into industrial and public utility firms. The industrial firm sample consists of 547 announcements made by 285 different companies. The public utility firm sample consists of 111 announcements made by 72 different companies.

Their results suggest that information of capital expenditures announced (disclosed) by managers is valuation relevant. They argue that the reactions of common stock prices to capital expenditure announcements are generally consistent with the hypothesis that managers act in the best interest of shareholders by maximising the market value of their firms through capital expenditure decisions. Overall, they find different results for industrial and public utility companies. In the case of industrial firms, they find that announcements of an increase (decrease) in capital expenditures

are associated with a statistically significant increase (decrease) in the market value of firms. For public utility firms, however, they find that neither announcements of capital expenditures increase nor announcements of capital expenditures decrease are associated with statistically significant changes in the market value of firms.

They argue that, for industrial firms, the positive relationship indicates that the market immediately capitalises the incremental positive net present value associated with the planned project to be carried out by the firm, while the negative association indicates that the firm has fewer positive net present value projects than the market previously anticipated. They further argue that for public utility firms, there is no positive net present value to be capitalised into the market when capital expenditures is increased; likewise, there is no previously capitalised net present value to be reduced when capital expenditures is decreased.

Woolridge (1988) examines the impact of capital expenditure announcements on stock market prices. The sample consists of 634 capital expenditure announcements. The duration of the study is from 1972 to 1984. The study uses a market-adjusted returns approach as the research methodology. He places capital investments into four categories: capital expenditures, joint venture, research and development expenditure, and product strategies. Their results suggest that the average two-day announcements period market-adjusted return is positive and significant for each of the four categories. Woolridge also finds that cumulative abnormal stock returns are positive for all categories of capital investments. He argues that stock markets are prepared to adopt a long-term view of corporate prospects and that corporate managers tend to make capital investment decisions designed to maximise

shareholder wealth. Therefore, it can be argued that capital expenditures plays a significant role in market valuation.

Woodridge and Snow (1990) investigate the relationship between capital spending announcements and stock market prices. The duration of the study is from 1972 to 1987. The sample consists of 767 announcements made by 248 companies in 102 industries. They employ a market-adjusted returns approach as the research methodology. They test three alternative hypotheses concerning the stock market's reaction to announcements of capital expenditures decisions. The shareholder value maximisation hypothesis, which predicts a positive reaction to corporate capital expenditures decisions, the rational expectations hypothesis, which predicts no stock market reaction to capital expenditure decisions, and the institutional investors hypothesis, which predicts a negative reaction to announcements of corporate capital expenditure decisions. The results suggest that the stock market reacts positively to corporate announcements of capital spending decisions. These results are consistent with the market value maximisation hypothesis but inconsistent with the institutional investors and rational expectations hypotheses. They also examine this issue on small versus large firms. The results for the sub-samples suggest significant evidence for the value relevance of capital expenditures in both small and large firms. Overall, they provide some evidence on the value relevance of capital expenditures.

Livnat and Zarowin, (1990) examine the association between components of cash flows (cash flow from operating, financing and investing activities) and stock market returns. This study covers a time period of 13 years (1974-1986). The sample consists of 345 firms. Data for this study is obtained from *Compustat Annual*

Industrial File and *Centre for Research in Security Prices*. They employ return models and use opening market value as a deflator. They find weak evidence for an association between cash flows from investing activities and stock market returns. The results highlight that cash flows from financing activities are positively and significantly associated with stock returns. Their results further suggest that cash inflows (cash outflows) from operating activities are positively (negatively) associated with stock market returns. In addition, they divide the sample into small and large firms and find similar results for the two groups.

Kerstein and Kim (1995) study the relationship between capital expenditures and stock market returns. The sample consists of 153 manufacturing firms. The study covers a time period of 14 years (1976-1989). The sources of their data are *Compustat* and *Centre for Research in Security Prices*. They employ a market-adjusted returns approach as their research methodology and use opening market value as a deflator. They find some evidence suggesting that capital investment information has a significant positive relation to stock market returns. In addition, they split their sample into small, medium and large firms and find similar results for all groups. Finally, they acknowledge that further research is needed to understand the relationship between capital expenditures and firm value.

Chan, Gau and Wang (1995) investigate stock market reaction to the announcements of capital investment decisions. The study covers a time period of 13 years (1978-1990). The sample consists of 447 announcements of business relocation decisions in the study period. They categorise relocation announcements as follows: (1) *Business expansion includes firms that relocate to a new facility such as expand into a new market or product line or to expand production capacity.* (2) *Cost savings or*

operating efficiency includes firms that move to a new facility to reduce operating costs or to increase production efficiency. (3) *Capacity reduction or phase out of business includes firms that close a facility and move the production at that site to other existing facilities.* (4) *Facilities consolidation includes firms that relocate and consolidate their facilities* (p. 85).

Their results suggest that the stock market reacts positively to investment decisions that are motivated by business expansion or cost savings, but react negatively to investment decisions that are motivated by capacity reduction or facilities consolidation. They argue that the positive market reaction to investment decisions that lead to business expansion or an increase in production efficiency may be caused by the positive information conveyed by the announcement about the firm's future cash flows. They also argue that the negative reaction to investment decisions that result in capacity reduction or facilities consolidation may be caused by unfavourable information about the firm's future investment opportunities. They conclude that the type of investment is less important in determining the market response to such announcements than the signal about future cash flows and investment opportunities. These findings indicate that the market is able to distinguish between good and poor investment prospects and on average, only rewards the firms that make good investments.

Blose and Shieh (1997) examine the relationship between stock market prices and capital expenditure announcements. Their sample consists of 313 announcements regarding capital expenditures. They split their sample into two different sub-samples, industrial and public utility firms. The study covers a time period of five years (1985-1989). Data for this study is obtained from *Wall Street Journal Index.*

They employ return models as the research methodology. The results for the industrial firm sample suggest a significant relationship between capital expenditure announcements and stock market returns. On public utility firms, however, they find that announcements of capital expenditures decisions do not have any material effect on stock market returns.

They argue that, for industrial firms, the positive and significant association between capital expenditure decisions and stock market prices indicate that the market immediately capitalises the incremental positive net present value (*NPV*)related to the planned capital expenditures. They further argue that the results for public utility firms indicate that there is no positive *NPV* to be capitalised when capital expenditures is announced.

Vogt (1997) analyses market reactions to capital expenditures decisions. This study covers a time period of 14 years (1979-1993). The sample consists of 561 firms. Data is obtained from the *Dow Jones News Retrieval Service, Centre for Research in Security Prices* and *Compustat* databases. The study employs a market-adjusted returns approach as the research methodology. Their results highlight evidence suggesting a significant role for capital expenditures in the market valuation of firms. He further concludes that the level of announced capital expenditures is strongly and positively related to the level of cash flow. Vogt (1997) argues that positive abnormal returns around capital spending announcements are associated with firms having low cash flow, and small asset size, and marginally with firms with both high and low insider ownership levels. In addition, the results suggest that abnormal returns increase for small firms as cash flow financed spending increases.

Chung, Wright and Charoenwong (1998) examine the impact of corporate capital expenditure decisions on stock market prices. The sample consists of 308 capital expenditure announcements. They divide the sample into high and low-technology firms. The study covers a time period of 15 years (1981-1995). Data for this study is extracted from *Nexis/Lexis* and *Compustat* databases. They adopt event study methodology and regression techniques to examine the stock market reaction to capital expenditure announcements. They find that announcements of increase (decrease) in capital expenditures positively (negatively) affect the stock market prices of firms with valuable investment opportunities. They also find that announcements of increase (decrease) in capital expenditures negatively (positively) affect the stock market prices of firms without such opportunities. They argue that stock price reaction to a firm's capital expenditure announcements depends more on the market's assessment of the quality of its investment opportunities than its industry affiliation.

Born and Ryan (2000) investigate stock market reaction to capital expenditure announcements. The study covers a time of 16 years (1980-1995). The sample consists of 394 capital expenditure announcements. Data is extracted from *Wall Street Journal Index* and *Lexis/Nexis* databases. They employ event study methodology as their research methodology. They find evidence suggesting that market responses to capital expenditure announcements are heterogeneous and differ according to size, growth opportunity, free cash flow and raising capital in financial markets. In addition, they find that for small firms, reaction to capital expenditure announcements is positively (negatively) related to free cash flow when managers have high (small) investment opportunities. Overall, they find weak evidence for a

positive relationship between capital expenditure changes and shareholders' response.

Kim (2001) studies the relationship between capital expenditures and stock market prices. The sample constructed for the study is drawn from *Compustat Annual Tapes* for the period 1976 to 1989. The sample is divided into positive-earnings and negative-earnings firms. The study uses cross-sectional analysis and opening market value as a deflator. Their results suggest that the capital expenditures coefficient is positive for winners and is positive for a majority of the losers. In short, he concludes that capital expenditures generally play an important role in market valuation.

2.5.2 Capital Expenditures and Firm Value in the United Kingdom

Al-Qudah (1991) examines the information content of the capital expenditures. The sample consists of 156 firms. The study covers a time period of 16 years (1972-1978). Data for this study is extracted from Datastream. He employs event study methodology as his research method and uses opening market value as a deflator. The results suggest a positive relationship between capital expenditures and stock market prices. Al-Qudah (1991) argues that managers disclose information about capital expenditures more regularly when the information is perceived to be useful to investors, where additional finance is required specifically for the additional capital expenditures or where the news is of an increase in capital expenditures. He further reports that the news relating to changes in the level of capital expenditures is impounded into share prices up to 24 months before the expenditure is actually incurred. In addition, he finds evidence suggesting that there is a relationship

between firm disclosure policy and the responsiveness of the market to formal disclosures.

Assiri (1993) investigates the association between stock market prices and capital expenditure announcements. This study covers a time period of ten years (1979-1988). Data for this study is extracted from Datastream. The sample is split into different sub-samples based on industrial sectors. The study employs a market-adjusted returns approach as the research methodology. The results suggest a significant and positive relationship between abnormal returns and capital expenditures. In addition, the study reports different and mixed results for different groups or sub-samples.

Rees (1997) investigates the value relevance of dividends, debt and capital investments in the UK. The study covers a time period of nine years (1987-1995). He employs cross-sectional valuation models. Data for this study is extracted from the *Extel Financial Company Analysis Service*. The results suggest that capital expenditures have a positive and significant relationship with the market value of firms. In addition, he finds that dividends have a stronger association with market value than retained earnings. The results also suggest that the amount of debt has a negative relationship with the market value of firms. In short, he finds evidence suggesting a dominant role for capital expenditures in the market valuation of UK firms.

Burton, Lonie, and Power (1999) investigate stock market reaction to the announcements of capital expenditures. The duration of the study is from 1989 to 1991. The sample includes 499 announcements made by 362 firms. Data is collected

from *EXTEL Weekly Financial News Summary*. They classify capital expenditure announcements into three different categories: (i) *immediate cash generating investments (ICG),* (ii) *non-immediate cash generating investments (NICG)* and (iii) *joint venture investments (JV)* (p. 688). They employ a market-adjusted returns approach as the research methodology. They find that the only significant variable is the announcement size for immediately cash generating investments. They further report non-significant results for prior funding, company size or market-to-book ratio. Overall, they find significant positive returns for joint ventures but not for either of the other single company categories. They acknowledge that further work is required to determine whether the contrasting results arise because there are differences in methodology or in the information provided by the disclosures in each instance. In addition, they highlight that firm size does not have a significant effect on the value of the abnormal returns around capital expenditure announcements.

Jones (2000) investigates whether corporate investment announcements are relevant to market valuation. The study covers a time period of six years (1991-1996). The sample consists of 563 capital investment announcements. Data is obtained from *Stock Exchange Regulatory News Services* and Datastream. The study employs a market-adjusted returns approach as the research methodology. He finds some evidence suggesting that the abnormal returns are significant and larger on the day of the announcement than on the day prior to or after the event day. He reports that there is a significant difference between the abnormal returns calculated for the day before the announcement and the day of the announcement. Furthermore, the results show a significant difference between the announcement day returns and the returns on the day after the announcement.

Their results suggest that capital expenditures information is being impounded in the stock price on the day of the announcement and that the appropriate event window would be to examine the returns on the day of the announcement. In addition, he reports that the value of corporate growth opportunities and project size reveal high levels of cross-sectional significance with abnormal returns. Overall, he concludes that the information about future investment opportunities is a significant factor in determining the market response to announcements of capital expenditures plans.

2.5.3 Capital Expenditures and Firm Value in other Different Countries

Del-Brio, Perote and Pindado (2003) examine stock market reaction to the announcements of capital expenditures in the Spanish market. Data is extracted from a database composed of the historical records of public announcements in the *Spanish Stock Market*. The sample consists of 114 announcements, 73 announcements related to investment and 41 to divestments. The study covers a time period of seven years (1991-1997). They employ event study methodology to measure the impact of investment announcements on the market value of firms.

They point out that the measure of abnormal performance around the announcement date raises outstanding implications regarding the rational expectations approach. Their results suggest that capital investment announcements do not convey new information to the market once they are released to the public. They argue that abnormal returns detected in the pre-event period (period before announcement day) indicate that somehow the information has already impounded into stock prices before the disclosure of the announcements. In addition, the results strongly support

the free cash flow hypothesis. In short, they provide weak evidence for the value relevance of capital expenditures.

Brailsford and Yeoh (2004) investigate the valuation of announcements of capital expenditures in the Australian market. They examine market response to capital expenditure announcements in the context of the agency problems created by differences in growth and free cash flow environment. The sample consists of 170 capital expenditure announcements. The study covers a time period of three years (1995-1997). Data is extracted from different sources: the announcement data is obtained from the *Securities Industry Research Centre of Asia-Pacific (SIRCA)*; accounting data is collected from the *Connect 4-Annual Reports Service*. They employ a market-adjusted returns approach as their research methodology. They find some evidence suggesting a positive market reaction around the announcement period. They further find evidence suggesting that the market reacts favourably for high growth firms and negatively for low growth firms. They also suggest that the market reacts negatively to the announcements made by the lowest cash flow group and most positively to the highest cash flow group.

Kim, Lyn, Park and Zychwicz (2005) examine the impact of capital expenditure decisions on the market value of Korean firms. The study investigates whether the capital expenditure decisions of Korean companies are consistent with the market value maximisation hypothesis. The duration of the study is from 1992 to 1999. The sample consists of 697 capital expenditure announcements. Their data is collected from *Securities Market Bulletin, Korean Securities Research Institute (KSRI)* and *Corporate Information Warehouse TS2001*. They employ event study method as their research methodology. They find positive abnormal returns surrounding capital

investment announcements. They further find that capital investment (joint venture) announcements generate significantly positive abnormal returns whereas capital investments announced by individual companies do not significantly increase shareholder wealth.

2.5.4 Discussion

When the results of all the above-mentioned studies are summarised, it can be argued that a majority assume a linear association between abnormal returns and capital expenditure plans. The literature generally suggests some evidence for the value relevance of capital expenditures. However, in the majority of studies the results are inconclusive and mixed. On the one hand, McConnell and Muscarella (1985), Woolridge (1988), Woolridge and Snow (1990), Al-Qudah (1991), Assri (1993), Kerstein and Kim (1995), Blose and Shieh (1997), Rees (1997), Vogt (1997), Chung, Wright and Charoenwong (1998), Jones (2000) and Brailsford and Yeoh (2004) find evidence suggesting a significant role for capital expenditures in the market valuation of firms. On the other hand, Livnat and Zarowin (1990), Burton, Lonie and Power (1999), Born and Ryan (2000), Del-Brio, Perote, and Pindado (2003) and Kim, Lyn, Park and Zychwicz (2005) find non-significant results for this issue.

Specifically, among these studies, McConnell and Muscarella (1985) find that capital expenditures is significantly associated with stock market returns, whereas Livnat and Zarowin (1990) find that cash flow from investing activities are non-significantly associated with stock returns. Further, the results provided by Al-Qudah (1991) and Rees (1997) suggest a strong role for capital expenditures in the market valuation of UK firms, whilst Burton, Lonie and Power (1999) find non-significant results.

However, Burton, Lonie and Power (1999) argue that the evidence presented in the existing literature is inconsistent and more research is needed on this issue. Overall, the results of most of the above-mentioned studies suggest some evidence for the value relevance of capital expenditures. However, it is evident from the literature that there is very little research on this issue in the UK. It can therefore, be argued that there is a gap for more research in this area in the UK.

Existing literature have mostly used return models rather than valuation models. However, there are arguments in support of valuation models in market-based accounting research. For instance, Rees (1997) argues that valuation models are more convenient than the more usual return model. He states that *any analysis of changes in accounting variables must compare one year's actual values with the previous year's actual values which may not be appropriate. Changes in accounting practices, in capital structure, or in the composition of the group may render the change variable misleading. This problem would not exist if the comparative accounting information published in financial statements were available on the databases, but it can be avoided by working with levels rather than changes. When working in levels only the current year's accounting variables need to be used* (p. 1113).

He further argues that in the valuation approach, it is a simple matter to investigate the impact of factors of profit and loss account or balance sheet, by restating earnings or book value into their components. As a consequence, it is possible to compare the value relevance of the distributed portion of earnings with that retained and the fixed interest portion of capital with total capital. Apart from convenience, the main

benefit is the capture of long-run associations, in contrast to the returns model, where only short-run relationships can be investigated.

Recently, cross-sectional analysis[7] is increasingly being used to examine the relationship between the market value of firms and various accounting variables. Many of studies have employed cross-sectional valuation models in order to investigate the value relevance of accounting variables for example Chauvin and Hirschey, (1994), with respect to goodwill asset; Green, Stark and Thomas, (1996), with respect to research and development expenditures; Rees, (1997), with respect to dividends, debt and capital investment; and Akbar and Stark, (2003b), with respect to dividends and capital contributions, among others.

This study intends to narrow this gap and to add to the existing limited literature in this area and hopes to shed further light on the relationship between capital expenditures and the market value of firms in the UK. This study employs cross-sectional and pooled sample analyses. It also applies event study methodology to investigate the effect of capital expenditure announcements on stock market prices surrounding the announcement dates. In addition, the study examines this issue for different sub-samples. The study also employs deflation and White's (1980) consistent standard error and covariance estimates to mitigate heteroscedasticity problems.

---

[7] Cross-sectional analysis has been used in both returns and valuation models: for returns models, see for example, Wilson (1986, 1987), Livnat and Zarowin (1990), Dechow (1994), Clubb (1995), and Green (1999), among others; for valuation models, see for example, Green, Stark and Thomas (1996), Rees (1997), Stark and Thomas (1998), and Akbar and Stark (2003b), among others.

2.6 Summary

Chapter 2 has discussed relevant literature. Most of the studies highlight that an increase (decrease) in capital expenditures leads to an increase (decrease) in the market value of firms. Different methods and techniques are employed in previous literature. The vast majority of the studies use multiple regression and almost all studies that investigate the impact of capital expenditure announcements on a firm's market value use an event study approach as the research methodology. The main conclusion we draw is that the results of all the studies reviewed provide some evidence for the value relevance of capital expenditures. Research on this issue in the UK is limited. The following chapter describes the research methodology.

Chapter 3

Research Methodology

3.1 Introduction

Relevant literature is discussed in Chapter 2. The survey of the literature explores some evidence concerning the value relevance of capital expenditures. In this chapter, we describe the research methodology. There are discussions on valuation models, and econometric issues related to estimating valuation models and remedies to these issues are also highlighted. A brief commentary is given on portioning the sample into different sub-samples.

The remainder of the chapter is outlined as follows. Section 3.2 discusses valuation models. Section 3.3 discusses cross-sectional regression analysis. Section 3.4 develops the valuation models used in this study. Section 3.5 provides an overview of event study method. Section 3.6 presents some bases employed to segregate the sample into different sub-samples for further analysis, and finally, section 3.7 concludes the chapter with a brief summary.

3.2 Valuation Models

In the last four decades or so, a number of researchers have identified the role of accounting information in equity valuation from theoretical and empirical standpoints (for example, Miller and Modigliani (1966), Ben-Zion (1984), Hirschey (1985), Hall (1993), Harris, Lang and Moller (1994), Rees (1997), Green, Stark and Thomas (1996), Collins, Maydew and Wieiss (1997), Nwaeza (1998), Garrod and Rees (1998), Stark and Thomas (1998), Cahan, Courtenay, Gronewoller and Upton

(2000), Graham, Lefanowicz and Petroni, (2003), Akbar and Stark (2003b), Bauman and Das (2004), Hand and Landsman (2005), among others). Most of these studies highlight that accounting information plays a significant role in the market valuation of firms. Valuation models based on the recent theoretical developments of Ohlson (1989, 1995) and Feltham and Ohlson (1995, 1996) have been used by researchers to assess firm valuation, as have economic value added models. The models of Ohlson (1989, 1995) and Feltham and Ohlson (1995, 1996) build on the traditional present value expected dividends (*PVED*) valuation method and illustrate the importance of financial statement items in valuation by showing that *PVED* and a clean surplus relationship imply that book value plus the present value expected abnormal earnings equals market value. Abnormal earnings are the difference between earnings and opening book value times the required rate of return (Walker, 1997). In management accounting abnormal earnings are defined as residual income.

On top of the capitalisation of future expected dividends model, the framework then applies two additional concepts. These two concepts relate to Modigliani and Miller (1958) and Miller and Modigliani (1961) and are:

1. Dividend payment and policy are irrelevant for equity valuation (i.e., an increase in dividend will be exactly offset by a decrease in current market value).

2. Expected future earnings depend on current dividend payments (i.e., an increase in current dividends reduce future earnings by an amount whose present value equals their amount).

In this context, Ohlson (1989) then derives the clean surplus approach to earnings measurement as the valuation relevant concept of earnings. In Ohlson's valuation framework, clean surplus earnings, book value and dividends are the three separate value relevant accounting variables. The accounting variables, clean surplus earnings and book value are important because of their relationship with future dividends.

This valuation framework allows for information other than clean surplus, book value and dividends but restricts the stochastic relation between such 'other information' and the basic accounting variables. Thus, the model imposes a condition that the prediction of other potentially value relevant information does not depend on accounting variables. However, such information may be useful for the prediction of future clean surplus earnings, book value and dividends. If these variables are value relevant, then such 'other information' becomes relevant in the valuation of the firm.

The studies by Ohlson (1989, 1995) and Feltham and Ohlson (1995, 1996) stand among the most important developments in market-based accounting research in the last 15 years. Bernard (1995) argues that the contribution of Ohlson (1989, 1995) provides a foundation for redefining the appropriate objective of research on the relationship between financial statement items and firm value. According to previous literature in market-based accounting research, Ohlson's model, and its subsequent refinements, has become the most pervasive valuation model in accounting research today.

Ohlson (1989, 1995) provides a rigorous foundation for firm value in a dynamic uncertain environment that relies on the clean surplus assumption. In this framework, variables other than book value, earnings and dividends play a role in equity valuation. Ohlson's (1989) work is cited as the theoretical foundation for many recent studies of the relation between stock market prices and various accounting variables. The equity valuation approach to investigating the value relevance of various accounting variables has been broadly employed in the existing literature in the US (for example, Sougiannis (1994), Kothari and Zimmerman (1995), Amir and Lev (1996), Collins, Maydew and Weiss (1997), Dechow, Hutton and Sloan (1999), Collins, Pincus and Xie (1999), among others).

Stark (1997) extends Ohlson's (1989) valuation framework and examines the value relevance of clean surplus earnings when there are two separate components of clean surplus earnings. Stark (1997) argues that clean surplus earnings are valuation relevant only when its separate components have no predictive value. In other words, this study supports the view that if the separate components of earnings have additional predictive ability over the sum of the components, then knowledge about the clean surplus earnings components, rather than their sum, is important. Akbar and Stark (2003b) extend this valuation framework to investigate the value relevance of dividends and capital contributions. This research project extends this valuation framework for investigating the value relevance of capital expenditures.

Researchers have used valuation models for investigating the impact of various accounting variables on the market value of firms in the UK. Green, Stark and Thomas (1996) employ a valuation approach to examine the value relevance of research and development expenditure in the UK. Rees (1997) adopts the valuation

approach to investigate the value relevance of dividend, debt and capital investments. Garrod and Rees (1998) use equity valuation models to examine the influence of international diversification on firm value. Stark and Thomas (1998) employ a valuation approach to investigate the value relevance of residual income. Akbar and Stark (2003b) use the valuation models to examine the valuation relevance of net shareholder cash flows, dividends and capital contributions.

3.3 Cross-Sectional Regression

Almost all empirical studies in accounting and finance involve time-series or cross-sectional analysis. Given observations on N firms for T time periods, cross-sectional research conducts T cross-sectional analyses and examines the distribution of the T sets of coefficients. In contrast, a time-series study conducts N time-series analyses and examines the cross-sectional distribution of N sets of coefficients (Beaver, Lambert and Morse (1980) and Christie (1982), among others). When we consider the nature and form of a relationship between any two or more variables, such as accounting and financial variables, the analysis suitable for such an investigation is referred to as regression analysis. In regression analysis, an important issue is the *'direction of causation'* between dependent and independent variables, i.e., positive or negative and linear or non-linear (Thomas (1997), among others).

Recently, researchers have developed cross-sectional regression to examine the relationship between the market value of firms or stock returns and the book value of equity, earnings and other accounting variables such as research and development expenditure, dividends, capital investment, advertising expenditure, goodwill, capital contributions and other information (for example, Hirschey (1982, 1985), Hirschey

and Spencer (1992), Chauvin and Hirschey (1993, 1994), Green, Stark and Thomas (1996), Rees (1997) and Akbar and Stark (2003b), among others). Therefore, it can be argued that the cross-sectional regression approach is an appropriate tool to investigate the association between accounting variables and the market value of firms.

3.3.1 Econometric Problems

In valuation studies, there are mainly two econometric problems that can cause biased coefficient estimates or biased standard error estimates and estimation inefficiency. These problems are cross-sectional scale differences among firms included in the sample and non-normality in the error term. Scale differences arise because in the same sample there exist large as well as small firms. In general, large (small) firms will have a large (small) total market value, large (small) book value and large (small) net income. Additionally, many other variables for these large (small) firms will also be large (small). The differences between these values will potentially result in heteroscedastic error variances and further, if the magnitude of these differences is not related to the research question, then it can cause scale related coefficient bias. Thus, an important point of any research design should be how to mitigate these problems (Bernard (1987) and Barth and Kallapur (1996), among others).

3.3.2 Remedies for Econometric Problems

In market-based accounting research, deflation is generally regarded as the most effective tool for mitigating heteroscedasticity and cross-sectional scale differences. Both the dependent and the independent variables of a regression equation are

deflated with a function of the independent variables. The purpose of deflation is to control for induced size effects. Previous literature has used different methods or techniques to handle econometric problems. Easton (1985) and Christie (1987) recommend deflated rather than un-deflated variables. Recently, a number of studies have employed deflated variables and White's (1980) consistent standard error and covariance estimates to overcome the cross-sectional problems and the potential size effects (for example, Lustgarten (1982), Livnat and Zarowin (1990), Ali and Pope (1995), Rees (1997), Strong (1997), Stark and Thomas (1998), Dechow, Hutton and Sloan (1999) and Akbar and Stark (2003b), among others). Previous studies have employed different deflators: among these studies, Lustgarten (1982) used number of shares, total assets, previous year's net income and market value, Rees (1997) employed number of shares, Stark and Thomas (1998) used closing book value and Akbar and Stark (2003b) used book value, opening market value, sales and number of shares.

This study employs deflated variables rather than un-deflated ones. It is believed that deflated variables cause less econometric problems in cross-sectional regression than those which are un-deflated. This study also uses White's (1980) consistent standard error and covariance estimates to mitigate coefficient biases and heteroscedasticity problems.

3.3.3 Multicollinearity

Multicollinearity refers to situations where two or more variables are highly linearly related (Belsely, Kuh and Welseh, 1980). The problem of multicollinearity is a feature of a given sample rather than an econometric problem. In cases of high

multicollinearity, the standard errors of one or more coefficients tend to be larger in relation to their coefficient values, thereby reducing *t* values. Large coefficients in the correlation matrix always signal the presence of multicollinearity. The presence of multicollinearity makes it difficult to explain the variation in the dependent variable change due to either of the two collinear independent variables. Ideally, however, multicollinearity should be between the dependent variable and independent variables. Howell (1995) suggests that the best method to reduce multicollinearity is to take the difference of each of the variables, since this will remove any collinearity due to shared time trends and/or shared causes. This may lead to lower R^2 and to larger confidence intervals for the coefficients.

Lev and Thiagarajan (1993) employ the Pearson correlation coefficient to test for multicollinearity. They demonstrate that they do not have seriously large correlations in their model, using a definition of large as above 0.32, whereas Livnat and Zarowin (1990) consider any correlation above 0.60 as having a severe multicollinearity problem in the data. In general, there is no formal criterion for determining the magnitude variance that is likely to cause poorly estimated coefficients. To test for multicollinearity problems in this study, sample correlations between the variables are calculated and reported. Sample correlations are presented when closing book value, number of shares, sales and opening market value are separately employed as the deflators.

3.3.4 Use of R^2

In simple linear regression models, R^2 measures the proportion of the valuation in the dependent variable explained by the multiple regression equation. R^2 is often used

informally as a 'goodness of fit' statistic and for the comparison of the validity of the regression results under alternative specifications of the independent variables in the model. Accounting researchers frequently use R^2, for example, for measuring the value relevance of accounting variables. However, there are a number of problems related to the use of R^2.

First, R^2 is sensitive to the number of the independent variables in the model. Thus, it can be increased with the inclusion of additional variables in the model. Second, the analysis of R^2 from deflated equations differs from that with un-deflated variables. As the value of R^2 is greatly affected by scale factors, it is difficult to compare R^2 obtained from a deflated equation with R^2 obtained from an un-deflated equation. Third, the use of R^2 is difficult when the intercept of the regression model is constrained to equal 0 because in such a situation, the ratio of the regression sum of squares to the total sum of squares need not lie between 0 and 1 and its interpretation becomes more difficult.

Nonetheless, if theory specifies a relationship in un-deflated form, as is the case above, the deflated form of the relationship estimated by regression techniques will only include a constant term if one of the independent variables is used. Hence, when book value is used as the deflator in estimating the valuation models, the regression equations either include a constant term or can be rearranged to do so. When opening market value, number of shares and sales are used as the deflators, the equations do not include a constant term and therefore the R^2 of these regressions is not constrained to lie between 0 and 1.

3.4 Model Development

Valuation models for this study are derived from systems of linear information dynamics. The valuation model used in this study is an extension of that developed by Akbar and Stark (2003b), which in turn is a simple extension of that of Ohlson (1989) and Stark (1997). As this research project examines the relationship between capital expenditures and the market value of firms, it extend the valuation model employed by Akbar and Stark (2003b) by including capital expenditures in their model. In addition to other control variables, the study also includes 'other information' in their model.

$$\textit{Model 1: } MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon \quad (1)$$

$$\textit{Model 2: } MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon \quad (2)$$

where MV is market value of the firm, BV is book value of equity, E is earnings, D is dividends, $CEXP$ is capital expenditures, RD is research and development expenditures, CC is capital contributions and OI is other information.

The valuation models cited above are estimated in deflated form on annual cross-sections of UK firms listed on the London Stock Exchange from 1990 to 2003 and a pooled sample, using four different deflators. The deflators are (i) book value, (ii) number of shares, (iii) sales, and (iv) opening market value. These deflators have previously been employed in cross-sectional valuation models: for example, closing book value is used in Green, Stark and Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003b); number of shares is employed in Rees (1997) and Akbar and Stark (2003b); sales is used in Hirschey (1985) and Akbar and Stark (2003b);

and opening market value is used in Kim (2001) and Akbar and Stark (2003b), among others. The use of four different deflators, as in Akbar and Stark (2003b), will add to the debate on the use of different deflators in valuation models, as discussed in previous studies (for example, Easton (1998), Easton and Sommers (2003) and Akbar and Stark (2003a), among others). This research project also uses ordinary least squares (*OLS*) techniques for estimating our regression equations and White's (1980) standard error approach to estimate coefficient standard errors. All the above techniques have been employed to reduce coefficient biases, to mitigate any problems caused by heteroscedasticity and to minimise cross-sectional differences.

3.5 An Overview of Event Study Method

The event study method is one of the most common methodological approaches to market-based empirical research (Ball and Brown (1968), Fama, Fisher, Jensen and Roll (1969), among others). Ball and Brown's (1968) study can be classified as an information content event-study, since it is a study analysing stock price behaviour up to and concurrent with the event. Fama, Fisher, Jensen and Roll's (1969) study can be classified as a test of market efficiency event-study, because it involves the analysis of stock price behaviour subsequent to the event. Both information content and market efficiency tests generally involve four steps.[8]

3.5.1 Establishment of Stock Price Reaction (Expectation) Model

This step generally involves developing an expectation model conditional upon an event, based on some directional hypotheses. In some cases, a researcher may not be

[8] See Strong (1992) for a review of event-study methodology.

willing to expect the direction of the stock price reaction, but expects all of the firms being studies to be affected in the same direction, whatever that direction might be. However, in most studies, the direction of the stock price reaction to the event is expected to differ across firms conditional upon information in or relevant to the event. Thus, a model is developed to partition the firms into expected positive and negative stock price reactions. For example, McConnell and Muscarella (1985) predict that an announcement of an unexpected increase in capital expenditures should have a positive impact on the market value of the firms and an announcement of an unexpected decrease in capital expenditures should have a negative impact on the market value on the firm.

3.5.2 Calculation of Abnormal Returns

The calculation of abnormal returns involves the calculation of actual returns and expected returns. Actual returns, or observed returns, for any time period are calculated by taking the difference in prices between the end and the beginning of the period, adjusted for dividends and other factors that may have affected the shareholding such as share splits and rights issues (Woolridge and Snow (1990), Corhay and Tourani (1996), Burton, Lonie and Power (1999), Del-Brio, Perote and Pindado (2003), Brailsford and Yeoh (2004) and Kim, Lyn, Park and Zychowicz (2005), among others).

3.5.3 Calculation of Cumulative Abnormal Returns

There are two commonly used techniques for calculating cumulative abnormal returns: one was developed by Ball and Brown (1968), called the abnormal performance index (*API*), and the other by Fama, Fisher, Jensen and Roll (1969),

called the cumulative average residual (*CAR*). The *CAR* technique adds average residuals over time for *T* periods. Many different windows are found in the existing literature: for example, two days in McConnell and Muscarella (1985) and Burton, Lonie and Power (1999); ten days prior and after event day in Del-Brio, Perote and Pindado (2003); Jones's (2000) test period is three days before and three days after the event day and Brailsford and Yeoh's (2004) test period is five days prior to the announcement day and five days after. The *CAR* (cumulative average residual) is a technique has been widely accepted and is the most commonly used approach for calculating cumulative abnormal returns, despite the development of more sophisticated and intuitively more appealing methods[9]. Brown and Warner (1980) state, *the properties of the confidence bands traced out by such alternative metrics were similar to those discussed for the CARs* (p. 227). Hence, for this reason, this part of this research project uses the *CAR* approach to calculate cumulative abnormal returns.

3.5.4 Analysing and Interpreting the Abnormal Returns

The final step in an event-study method is to analyse and interpret the abnormal returns. The objective is to use a statistical test to indicate whether abnormal returns are statistically different from zero. In some situations it may be sufficient or even necessary to confine this step to using descriptive statistics. Fama, Fisher, Jensen and Roll (1969) conducted no statistical tests in their pioneering study. Similarly, Blanchard, Lopez-de-Silanes and Shleifer (1994) provide only descriptive statistics. However in some cases, tests of statistical significance are required to confirm or

---

[9] See for example, Roll (1983), Blume and Stambaugh (1983) and Dimson and Marsh (1986), who discuss the possible bias introduced by *CAR*. See also Beaver and Dukes (1972), Pettit (1972) and Patell (1976) for a discussion of modified forms of *API* and *CAR*.

reject the hypotheses. Previous studies have applied different statistical tests to indicate whether or not abnormal returns are statistically different from zero (for example, McConnell and Muscarella (1985), Woolridge and Snow (1990), Livnat and Zarowin (1990), Burton, Lonie and Power (1999), Jones (2000), Del-Brio, Perote and Pindado (2003), Brailsford and Yeoh (2004) and Kim, Lyn, Park and Zychowicz (2005). Among these studies, McConnell and Muscarella (1985) applied the difference of means and binomial statistical tests to determine the statistical significance of announcement period return. Jones (2000) applied the Wilcoxon test to determine the significance of abnormal returns and the Wilcoxon matched pairs signed-rank test is applied to determine the significance of the difference between the abnormal returns calculated in two different windows.

3.5.5 Statistical Tests

According to the discussion in the previous section, the statistical tests applied in this study include the binomial test, the Kolmogorov-Smirnov sample test and the Mann-Whitney-Wilcoxon test. The binomial test is used to test whether the percentage of positive abnormal returns during the announcement period is statistically different from the expected percentage of positive returns. To test whether the mean abnormal returns (*ARs*) and cumulative abnormal returns (*CARs*) of a sample are statistically greater than zero, the Kolmogorov-Smirnov test is applied. The Mann-Whitney-Wilcoxon approach is used to test whether the difference in mean *ARs* and *CARs* between two periods is statistically significant.

3.6 Empirical Estimation on Sub-Samples

Investigation of the value relevance of accounting variables in different sectors or groups is a longstanding practice in the accounting and finance literature (Akbar, 2001). In order to examine the valuation relevance of capital expenditures in different sectors, the sample is reorganised and divided into different sub-samples. The sub-sampling takes place in the context that different sectors in the population under study might have different characteristics that may affect conclusions regarding the value relevance of capital expenditures. Thus, there is a possibility that capital expenditures may be value relevant for one sector or group of firms, such as small, medium or large firms, but not for another sector or group, due to some special characteristics of a particular sector or group that might affect the valuation relevance. This study conducts three different analyses: size-based analysis, and analyses of manufacturing versus non-manufacturing firms and profit versus loss-making firms.

3.6.1 Firm Size-Based Analysis

Previous studies have highlighted mixed and inconclusive results for firm size effects on the value relevance of capital expenditures (Woolridge and Snow (1990), Livnat and Zarowin (1990), Connolly and Hirschey (1990) and Burton, Lonie and Power (1999), among others). In order to examine size effects on the value relevance of capital expenditures, the sample for all annual cross-sections and the pooled sample are divided into small, medium and large firms based on the market value of firms. The models are estimated for all annual cross-sections and the pooled sample for all

deflators used in this study. This procedure provides evidence of the impact of size on the value relevance of capital expenditures.

3.6.2 Analysis on the Basis of Manufacturing and Non-Manufacturing Firms

Due to firm-specific characteristics in the manufacturing and non-manufacturing firms, there may be differences in the value relevance of capital expenditures in these two sectors (Chambers, Jennings and Thompson (1999), Akbar (2001) and Kim, Lyn, Park and Zychowicz (2005), among others). All of these studies report some differences between manufacturing and non-manufacturing sectors. In order to investigate this issue in different sectors, the sample for all annual cross-sections and the pooled sample are each split into two sub-samples (manufacturing and non-manufacturing sectors). These analyses highlight the differences in the value relevance of capital expenditures between the manufacturing and non-manufacturing sectors.

3.6.3 Analysis on the Basis of Profit and Loss-Making Firms

Previous research has reported different results on the value relevance of accounting variables between firms producing profits and those producing losses, for instance, Hayn (1995), Collins, Pincus and Xie (1999) and Kim (2001). Among these studies, Kim (2001) documents some differences in the value relevance of capital expenditures between profit and loss-making firms in the US. Therefore, this study also investigates the differences between the valuation relevance of capital expenditures in both profit and loss-making firms. The data for all annual cross-sections and for the pooled sample are each divided into two sub-samples (profit and loss-making firms). All of the above-discussed analyses (size, manufacturing versus

non-manufacturing and profit versus loss-making firms) are performed in Chapter 7 of this study.

3.7 Summary

This chapter discussed the research methodology. The discussion highlights some points about valuation models. It also described the econometric problems and some remedies were provided for these problems. The chapter also provided an overview of event study methodology. Empirical estimation on sub-samples is also highlighted in this chapter. The following chapter describes the sample and the data collection process. The sample consists of all non-financial UK companies listed on the London Stock Exchange.

Chapter 4

Data and Sample

4.1 Introduction

Chapter 3 has described the research methodology adopted to carry out this study. In this chapter, the sample description and data collection process are discussed. The first objective regarding the sample is to construct one as large as possible and the second is to mitigate, as far as possible, the presence of survivorship bias. In order to fulfil these objectives, both live and dead lists of all non-financial UK companies are extracted from Datastream. The live and dead lists are rearranged according to financial year-ends. The market value of each company is calculated six months after its financial year-end. According to financial year-end, 12 groups are formed. Cross-sections are constructed for each calendar year (1990-2003).

The rest of the chapter is outlined as follows. Section 4.2 describes the procedures used to extract the sample and reorganisation. Section 4.3 highlights data collection processes. Section 4.4 presents deletions from the sample. Section 4.5 describes announcement data. Section 4.6 states relevant variable measurements and definitions and lastly, section 4.7 concludes the chapter in brief summary.

4.2 Sample Selection

The sample consists of all non-financial UK companies listed on the London Stock Exchange available in Datastream. The sample covers a time period of 14 years (1990-2003). The study period starts from 1990 because there is no data available in Datasream for some variables such as research and development expenditures (*RD*).

In order to reduce survivorship bias, both live and dead UK firms are included in the sample. The sample is rearranged according to some conditions (presented in some detail below), after which both live and dead companies are combined in one list.

4.2.1 Live Companies List

We extract a list of UK live companies including company name, Datastream company code (*DSCD*), industrial classification code (*INDC*), industrial grouping code (*INDM*) and latest financial year-end (*LYE*). This list is rearranged on the basis of *INDC*: (a) financial companies, (b) unclassified companies, (c) suspended equities and (d) unquoted equities. All of these companies are excluded from the sample. Financial companies are excluded because the assets are often invested on behalf of third parties and consigned to them on lease arrangements. Copeland, Weston and Shastri (2005) argue that owning the asset exposes the lessor to more risk than a lending position of an equal dollar amount. On the other hand, owning the total project includes not only the risk of its debt but also the total risk of its cash flows. The list is also sorted on the basis of *LYE*: (i) companies whose financial year-ends are unavailable, (ii) companies whose financial year ends on or before 31 December 1989[10] and (iii) companies whose financial year-end is not on the final day of a month. All of these companies are also deleted from the sample.

4.2.2 Dead Companies List

Dead companies are also extracted from Datastream and are sorted according to their industrial classification (*INDC*). Financial companies, unclassified companies,

[10] All companies whose financial year-end (LYE) is on or before 31 December 1989 are excluded from the sample because the study period starts from January 1990.

suspended equities and unquoted equities are deleted from the sample. The list is also rearranged on the latest financial year-end (*LYE*) basis: (i) companies whose financial year-ends are unavailable, (ii) companies whose financial year ends on or before 31 December 1989 and (iii) companies whose financial year-end is not on the final day of a month. All of these companies are also excluded from the sample. Table 4.1 displays these deletions from live and dead companies.[11]

4.2.3 Combination of Live and Dead Firms in One List and Group Formation

As a consequence of the above process, two lists (UK live and dead companies) are constructed. These lists are combined in one list. The combined list is sorted according to the financial year-end. The list starts with January year-end firms and ends with December year-end firms. This list is rearranged into twelve groups depending on the financial year-ends: for example, companies whose financial years end on 31 January are in group 1, companies whose financial years end on 28 February are in group 2, companies whose financial years end on 31 March are in group 3, and so on until group 12 includes companies whose financial years end on 31 December. Thus, we create 12 different lists starting from January year-end companies and ending with December year-end companies.

This procedure is undertaken because we have to calculate the market value of each company six months after its financial year-end. For example, for group 1, which consists of companies whose financial years end on 31 January 1990, market value for 1990 must be calculated on 1 August 1990, and group 9, which includes companies whose financial year ends on 30 September 1990, market value for 1990 must be measured on 1 April 1991, and so on. Table 4.2 shows these groups.

---

[11] Distribution of the sample by industrial classification (*INDC*) is provided in Appendix 1.

4.3 Data Collection

Data is extracted from Datastream for 14 years (1990 – 2003). Accounting data are extracted for all groups year by year from 1990 to 2003. The market value of firms is extracted six months after the financial year-end for each group.

4.4 Deletions

4.4.1 Deletions of Missing Data

Cross-sections are formed for each of the calendar years from 1990 to 2003. Firms in any annual cross-section must satisfy the following conditions: (i) all of the data required for the study's main variables must be available, (ii) closing book value must be positive, because it is employed as one of the deflators, and (iii) the currency of the financial statements is sterling. According to the above points, data is rearranged on the basis of the required criteria for the main variables of the model. Companies with missing data for those variables are deleted from the sample. The data is also rearranged on the basis of positive book value and firms with negative book value are excluded from the sample. Tables 4.3, 4.4, 4.5, and 4.6 contain a summary of these deletions, the final sample in each annual cross-section and the pooled sample for all four deflators.

4.4.2 Deletions of Outliers

On average, our sample consists of 1000 firms in each annual cross-section. Traditionally, in any large set of data, there exist observations with extreme values. Retention of values which have a big impact on the whole sample risks forcing the

regression line upward or downward for the many 'normal' observations. Once outliers and influential variables are deleted, such possibilities for bias are eliminated. Fieldsend, Longford and McLeay (1987) show how the influential observations in one sector bias the bivariate lognormal regression on estimates. It turns out that a single company caused the whole sector to have an outlying slope residual, so they decided to exclude the outliers. These observations with extreme values (outliers) may cause problems in least square regressions.

To handle extreme values in the sample, the traditional criterion that has been employed frequently in previous research (Easton and Harris (1991), Strong and Walker (1993), Rees (1997) and Akbar and Stark (2003b), among others) is the deletion of the top and bottom 0.5% for each variable. This research project has adopted this criterion to deal with observations with extreme values. Observations of the top and bottom 0.5% of values for each variable employed in this study are excluded from the sample. Deletions as outliers (extreme values) are reported in Tables 4.3, 4.4, 4.5, and 4.6.[12]

4.5 Announcement Data

One objective of the research project was to analyse the market values of corporations around the time at which they reveal information about their capital expenditures plans. To accomplish this objective, a sample of firms that made announcements about their capital expenditures plans over the 14-year period 1990 through 2003 was constructed. Only announcements about a firm's capital expenditures plans were included in the sample. Capital expenditure announcements

[12] Frequency distribution of the pooled sample by means of industrial classification after deletion of outliers is presented in Appendix 2.

were gathered from different sources: Financial Times, UK Activity Report and Regulatory News Services (RNS). The search was conducted using words: 'capital expenditures', 'capital spending', 'capital outlays', 'planned expenditures', 'capital expenses' and 'long term expenditures' announcements. These key words are used in previous research to search for capital expenditure announcements (for example, Woolridge and Snow (1990), among others). However, only the announcements meeting the following criteria are included in the sample.

1. Announcements must be directly pertinent to capital expenditures decisions. The announcement data set only includes the announcements of changes in capital expenditures. Thus, announcements of corporate acquisitions, tender offers, or short-term strategic alliances are all excluded from the sample.

2. Announcements must be made in isolation of other announcements (for example, announcements on sales, earnings, dividends, equity or debt offerings, or top management changes, or announcements for creating or cutting jobs).

3. Announcements of capital expenditures by corporate subsidiaries or corporate divisions are deleted.

4. Announcements must be made during the study period (1990–2003). These procedures are used to minimise the effect of extraneous influences on security prices.

5. Returns and market value data must be available for each announcing firm. Returns and market value data are then extracted from Datastream for each announcing firm and for the market.

After the above deletions, the sample consists of 884 capital expenditure announcements made by 426 companies allocated in different sectors.[13] Tables 4.7 to 4.11 present the frequency distribution of capital expenditure announcements over the study period (1990-2003). Table 4.7 shows the announcements reorganised according to the above conditions. Table 4.8 displays the frequency distribution of capital expenditure announcements by month: it suggests that there is some clustering of announcements during the months of March through September.

Table 4.9 exhibits the frequency distribution of capital expenditure announcements by year. It shows that most capital expenditure announcements occurred in recent years while few announcements are shown in earlier years. The difference is due to the availability of announcements sources: for example, Financial Times, which is considered to be one of the main data sources, is only available for recent years in the University Databases. In addition, the economic recession over the period 1990-1991 may partially explain the small number of capital expenditure announcements over this period.

Table 4.10 shows the frequency distribution of capital expenditure announcements by industry sector as a percentage. The percentage is the highest for the Business Support Services sector (6.2%) and lowest (0.1%) for different industry sectors

---

[13] Distribution of capital expenditure announcements by industry sector is provided in Table 4.10 Frequency distribution of capital expenditure announcements by industrial classification and announced firms is provided in Appendix 3.

included in the sample, for example, Household Product, Paper, Personal Product, Oil Services and other sectors. Table 4.10 also suggests that most industry sectors are included in our sample. There is no evidence to indicate that the observations in our sample are concentrated in one particular industry sector.

Following McConnell and Muscarella (1985), capital expenditures announcements have been classified according to the intended use of the funds into: announcements involving funds regarding plant, equipment and machinery (fixed assets); announcements involving funds budgeted for exploration and development; announcements involving funds budgeted for the specific purpose of constructing retail stores; and finally, announcements involving an unspecified intended use of the funds are categorised as a separate group. Table 4.11 exhibits the distribution of capital expenditure announcements according to the intended use of the funds.

4.6 Variable Definitions

1. **Market value** (MV_t)[14] is measured six months after the balance sheet date. For example, for a firm whose financial year ends on 31 December 1990, its market value is measured on 1 July 1991 or nearest trading day, and for a firm whose financial year ends on 31 December 1995, market value is measured on 1 July 1996. A time point six months after the balance sheet date is used to ensure that the information in the financial statements for a given financial year is reflected in the market price and because UK firms have six months in which to prepare and release their financial statements. This definition is in line with previous research (for example, Green, Stark and

[14] Opening market value (MV_{t-1}) is measured 12 months before MV_t for each company.

Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003a, 2003b).

2. **Book value** (BV_t) is measured as the sum of shareholder equity capital and reserves at the end of financial year *t*.

3. **Earnings** (E_t) are measured as the profit for the financial year as reported in the income statements plus research and development expenditures (*RD*), both for the financial year *t*. *RD* is added back in line with previous research, for example, Akbar and Stark (2003b).

4. **Research and development expenditures** (RD_t) are measured as research and development expenses reported in the income statement for the financial year *t*. This definition is also in line with previous research (for example, Green, Stark and Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003b), among others).

5. **Dividends** (D_t) are measured as the ordinary dividends declared during the financial year *t*.

6. **Capital contributions** (CC_t) are measured as the negative of the sum of funds raised by equity issued for cash and equity issued for acquisitions. This definition is also in line with Akbar and Stark (2003b).

7. **Capital expenditures** ($CEXP_t$) are measured as the amount specified by the company under capital expenditures. This is the cash paid by the company as capital expenditures during the year.[15]

---

[15] This definition is in line with previous research. (See for example, Peterson and Benesh (1983), Al-Qudah (1991), Griner and Gordon (1995), Kerstein and Kim (1995), Gordon and Iyengar (1996),

8. **Sales** *(SA)* for the year *t* is measured as sales revenue for the financial year *t*, as reported in the income statement.

9. **Number of shares** *(NS)* for year *t* is measured as the number of shares issued and outstanding at the end of financial year *t*.

4.7 Summary

This chapter has described procedures that are followed during the sample and data collection process. Deletions of missing data and outliers are highlighted. Variable definitions are also presented. Data analysis and interpretation along with the findings (the empirical part of this research) are presented in next chapters. The following chapter investigates the impact of capital expenditures on the market value of firms.

Vogt (1997), Chambers, Jennings and Thompson (1999), Ballester, Livnat and Sinha (1999), Lamont (2000), Jones (2000), Kim (2001), Kothari, Laguerre and Leone (2002) and Kim, Lyn, Park and Zychowicz (2005)).

Table 4.1: Sample Reorganisation

Reorganisation Conditions	No. of firms deleted	Total No. of Firms
Total no. of companies extracted from Datastream (live & dead companies)		**5735**
Companies whose latest financial year-end (LYE) is unavailable	646	
Companies whose latest financial year-end (LYE) was on or before 31/12/1989	1747	
Companies whose latest financial year-end (LYE) is not on the final day of a month	19	
Companies whose industrial classifications are unclassified, suspended or unquoted equities;	159	
Financial companies and companies included twice in the list.	330	
Other companies (for example, assets managers, property agencies, real estate and development)	241	
Total deletions	3142	**(3142)**
Remaining companies		**2593**

Table 4.2: Own Groups

Groups	No. of companies	FYE
Group 1	96	January 31
Group 2	52	February 28
Group 3	590	March 31
Group 4	125	April 30
Group 5	62	May 31
Group 6	228	June 30
Group 7	59	July 31
Group 8	56	August 31
Group 9	213	September 30
Group 10	54	October 31
Group 11	26	November 30
Group 12	1032	December 31
Total	**2593**	

Table 4.3: Deletions from the Sample (Book Value as Deflator)

Year	Total obs.	Data n. a.*	Missing *MV*	Missing *BV*	Neg. *BV*	Missing *E*	Double Code	Sus./Unq. Equity	Outliers 0.5%	Final Sample
1990	2593	1350	3	239	25	0	11	16	39	**910**
1991	2593	1290	3	284	36	0	10	13	36	**921**
1992	2593	1221	2	355	41	3	13	12	32	**914**
1993	2593	1106	3	441	42	1	15	6	31	**948**
1994	2593	1059	2	461	41	1	11	6	42	**970**
1995	2593	951	0	539	46	1	14	9	47	**986**
1996	2593	717	0	628	48	2	13	8	43	**1134**
1997	2593	584	4	614	46	3	14	15	52	**1261**
1998	2593	470	1	751	66	4	13	14	42	**1232**
1999	2593	395	1	941	69	5	12	14	39	**1117**
2000	2593	259	1	1110	46	4	12	22	40	**1099**
2001	2593	159	0	1138	57	3	15	19	33	**1169**
2002	2593	154	0	1198	90	3	13	18	37	**1080**
2003	2593	43	0	1292	108	4	15	5	13	**1113**
All	36302	9758	20	9991	761	34	181	177	526	**14854**

MV is market value; *BV* is book value; and *E* is earnings.
* Unavailable

Table 4.4: Deletions from the Sample (Number of Shares as Deflator)

Year	Total Observations.	Data n. a.*	Missing *MV*	Missing *BV*	Neg. *BV*	Missing *E*	Double Code	Sus./Unq. Equity	Outliers .5%	Missing NS	Final Sample
1990	2593	1350	3	239	25	0	11	16	41	4	**904**
1991	2593	1290	3	284	36	0	10	13	31	16	**910**
1992	2593	1221	2	355	41	3	13	12	23	15	**908**
1993	2593	1106	3	441	42	1	15	6	27	17	**935**
1994	2593	1059	2	461	41	1	11	6	31	14	**967**
1995	2593	951	0	539	46	1	14	9	34	22	**977**
1996	2593	717	0	628	48	2	13	8	29	19	**1129**
1997	2593	584	4	614	46	3	14	15	38	40	**1235**
1998	2593	470	1	751	66	4	13	14	39	46	**1189**
1999	2593	395	1	941	69	5	12	14	37	59	**1060**
2000	2593	259	1	1110	46	4	12	22	39	52	**1048**
2001	2593	159	0	1138	57	3	15	19	32	36	**1134**
2002	2593	154	0	1198	90	3	13	18	29	32	**1056**
2003	2593	43	0	1292	108	4	15	5	11	8	**1107**
All	36302	9758	20	9991	761	34	181	177	441	380	**14559**

MV is market value; *BV* is book value; *E* is earnings; and *NS* is number of shares.
* Unavailable

Table 4.5: Deletions from the Sample (Sales as Deflator)

Year	Total Observations.	Data n. a.*	Missing *MV*	Missing *BV*	Neg. *BV*	Missing *E*	Double Code	Sus./Unq. Equity	Outliers .5%	Final Sample
1990	2593	1350	3	239	25	0	11	16	42	**907**
1991	2593	1290	3	284	36	0	10	13	39	**918**
1992	2593	1221	2	355	41	3	13	12	35	**911**
1993	2593	1106	3	441	42	1	15	6	31	**948**
1994	2593	1059	2	461	41	1	11	6	44	**968**
1995	2593	951	0	539	46	1	14	9	51	**982**
1996	2593	717	0	628	48	2	13	8	49	**1128**
1997	2593	634	4	664	46	3	14	15	59	**1154**
1998	2593	470	1	751	66	4	13	14	62	**1212**
1999	2593	395	1	941	69	5	12	14	47	**1109**
2000	2593	259	1	1110	46	4	12	22	44	**1095**
2001	2593	159	0	1138	57	3	15	19	43	**1159**
2002	2593	154	0	1198	90	3	13	18	45	**1072**
2003	2593	43	0	1292	108	4	15	5	15	**1111**
All	36302	9808	20	10041	761	34	181	177	606	**14674**

MV is market value; *BV* is book value; and *E* is earnings.
* Unavailable

Table 4.6: Deletions from the Sample (Opening Market Value as Deflator)

Year	Total Observations.	Data n. a.*	Missing *MV*	Missing *BV*	Neg. *BV*	Missing *E*	Double Code	Sus./Unq. Equity	Outliers .5%	Missing OMV	Final Sample
1990	2593	1350	3	239	25	0	11	16	41	18	**890**
1991	2593	1290	3	284	36	0	10	13	33	18	**906**
1992	2593	1221	2	355	41	3	13	12	29	13	**904**
1993	2593	1106	3	441	42	1	15	6	28	19	**932**
1994	2593	1059	2	461	41	1	11	6	31	27	**954**
1995	2593	951	0	539	46	1	14	9	27	26	**980**
1996	2593	717	0	628	48	2	13	8	47	48	**1082**
1997	2593	584	4	614	46	3	14	15	54	37	**1222**
1998	2593	470	1	751	66	4	13	14	40	25	**1209**
1999	2593	395	1	941	69	5	12	14	41	17	**1098**
2000	2593	259	1	1110	46	4	12	22	38	49	**1052**
2001	2593	159	0	1138	57	3	15	19	36	43	**1123**
2002	2593	154	0	1198	90	3	13	18	33	20	**1064**
2003	2593	43	0	1292	108	4	15	5	10	4	**1112**
All	36302	9758	20	9991	761	34	181	177	488	364	**14528**

MV is market value; *BV* is book value; *E* is earnings; and *OMV* is opening market value.
* Unavailable

Table 4.7: Derivation of the Sample for the Announcement Data Set

Reorganisation Criteria	Announcements Deleted	Total Announcements
Initial Sample Size		**1732**
Less: Non-Capital expenditures Announcements:		
Corporate acquisition announcements	177	
Tender offers announcements	65	
Mergers and takeover announcements	124	
Short-term strategic alliances	145	
Subtotal	**511**	**511**
Less: Announcements made by financial firms		**25**
Less: Concurrent announcements		**41**
Less: Announcements made before 1 Jan. 1990 or after 31 Dec. 2003		**17**
Less: Announcement for contract awarded		**29**
Less: Other announcements:		
Announcements on sales and/or earnings	35	
Announcement on dividends	44	
Announcement on equity or debt issues	28	
Announcement on management changes	16	
Announcement of creating or cutting jobs	50	
Announcement without accounting information	14	
Subtotal	**187**	**187**
Less: Announcements made by firms whose returns or market value are unavailable		**38**
Subtotal for exclusion		**(848)**
Remaining announcements for analysis		**884**

Table 4.8: Frequency Distribution of Capital expenditures Announcements by Month (1990-2003)

Month of the Year	Number of Announcements	Percentage %
January	56	6.3
February	48	5.4
March	85	9.6
April	61	6.9
May	79	8.9
June	72	8.1
July	80	9.1
August	74	8.4
September	96	10.9
October	71	8
November	88	10
December	74	8.4
Total	**884**	**100**

Table 4.9: Frequency Distribution of Capital expenditures Announcements by Year (1990-2003)

Month of the Year	Number of Announcements	Percentage %
1990	13	1.5
1991	9	1
1992	9	1
1993	11	1.2
1994	7	0.8
1995	39	4.4
1996	73	8.3
1997	117	13.2
1998	115	13
1999	120	13.6
2000	117	13.2
2001	76	8.6
2002	80	9.1
2003	98	11.1
Total	**884**	**100**

Table 4.10: Frequency Distribution of Capital expenditures Announcements by Industry (1990-2003)

Industry	INDC	Announcements	%
Aerospace	AEROS	12	1.4
Airlines & Airports	AIRLN	10	1.1
Auto Parts	AUPRT	15	1.7
Biotechnology	BIOTC	19	2.1
Building & Construction Materials	BMATS	34	3.8
Builders Merchants	BMERC	6	0.7
Beverages – Brewers	BREWS	4	0.5
Business Support Services	BUSUP	55	6.2
Chemicals, Commodity	CHEMS	4	0.5
Chemicals, Advanced Materials	CHMAV	9	1
Chemicals, Speciality	CHMSP	29	3.3
Clothing & Footwear	CLTHG	3	0.3
Computer Services	CMPSV	13	1.5
Consumer Electronics	CNELE	11	1.2
Commercial Vehicles & Trucks	COMMV	3	0.3
Computer Hardware	COMPH	6	0.8
Defence	DEFEN	2	0.2
Delivery Services	DELSV	1	0.1
Beverages - Distillers & Vintners	DISTV	9	1
Diversified Industries	DIVIN	3	0.3
Discount & Superstores and Warehouses	DSCST	6	0.7
Vehicle Distribution	DSVHL	15	1.7
Education - Business Training & Employment	EDUTR	5	0.6
Electricity	ELECT	9	1
Electrical Equipment	ELEQP	2	0.2
Electronic Equipment	ELETR	17	1.9
Engineering Contractors	ENGCO	3	0.3
Engineering Fabricators	ENGFA	3	0.3
Engineering General	ENGIN	33	3.7
Food Processors	FDPRD	40	4.5
Food & Drug Retailers	FDRET	26	2.9
Furnishing & Floor-coverings	FURFL	7	0.8
Gambling	GAMNG	3	0.3
Household Appliances & Housewares	HAPPL	4	0.5
Retail – Hardlines	HARDL	17	1.9
Hospital Management & Long-Term Care	HOSPM	2	0.2
Hotels	HOTEL	18	2
House Building	HOUSE	12	1.4
Household Products	HSEPR	1	0.1
Internet	INTNT	3	0.3
Leisure Facilities	LEISR	31	3.5
Leisure Equipment	LSREQ	3	0.3
Media Agencies	MEDAG	12	1.4
Medical Equipment & Supplies	MEDEQ	12	1.4
Other Mineral Extractors & Mines	MINES	4	0.5
Multi-Utilities	MTUTL	2	0.2
Retailers - Multi-Department	MULTI	20	2.3
Non-Ferrous Metals	NOFMS	1	0.1

Oil & Gas Exploration & Production	OILEP	17	1.9
Oil Integrated	OILIN	5	0.6
Other Construction	OTHCN	19	2.2
Other Health Care	OTHCR	1	0.1
Paper	PAPER	1	0.1
Pharmaceuticals	PHRMC	23	2.6
Personal Products	PRNSL	1	0.1
Publishing & Printing	PUBLS	39	4.4
Restaurants & Pubs	RESTS	43	5
Rail, Road & Freight	RROAD	22	2.5
Security & Alarm Services	SECAL	2	0.2
Shipping & Ports	SHPNG	15	1.7
Retailers, Soft Goods	SOFTG	20	2.3
Software	SOFTW	32	3.6
Steel	STEEL	5	0.6
Subscription Entertainment Networks	SUBEN	2	0.2
Telecommunications Equipment	TELEQ	8	0.9
Fixed-Line Telecommunication Services	TELFL	16	1.8
Wireless Telecommunication Services	TELWR	8	0.9
Textiles & Leather Goods	TEXOT	2	0.2
TV, Radio & Filmed Entertainment	TVRFE	28	3.3
Environmental Control	WASTE	9	1
Water	WATER	7	0.8
Total		**884**	**100**

Table 4.11: Frequency Distribution of Capital expenditures Announcements by Intended Use of Funds (1990-2003)

Intended Use of Funds	Number of Announcements	%
Plant, Equipment and Machinery	196	22.2
Exploration and Development	115	13.0
Retail Stores	86	9.7
Unspecified	487	55.1
Total	**884**	**100**

Chapter 5

The Value Relevance of Capital expenditures

5.1 Introduction

The sample and data collection process are described in Chapter 4. This chapter examines the data using descriptive statistics for all variables in the study and a correlations matrix for the independent variables in the pooled sample. To examine the value relevance of capital expenditures, multi-regression analysis was performed for all annual cross-sections and the pooled sample. The results are provided in Tables 5.3 to 5.11.

The remainder of the chapter is organised as follows. Section 5.2 highlights the research approach. Section 5.3 examines the data using descriptive statistics. Section 5.4 presents correlation matrix. Data analysis is given in section 5.5 in two sub-sections: sub-section 5.5.1 briefly describes the valuation model employed and interprets the results; sub-section 5.5.2 discusses the 'other information' variable and provides the results after including 'other information' in the model. Section 5.6 presents a brief discussion of the outcomes and finally, section 5.7 concludes the chapter with a brief summary.

5.2 The Research Approach

The research methodology is described in Chapter 3. In this section, the research approach is briefly highlighted. As it has been mentioned previously, this study follows valuation and return models. This chapter employs valuation models. The

research approach adopted in this chapter examines and analyses two valuation models on a sample of firms for the years 1990 to 2003. The results are presented for all annual cross-sections as well as for pooled sample for all four deflators employed. This research project adopted Akbar's (2001) approach to interpret the results, where a non-zero coefficient on capital expenditures is interpreted as its value relevance. This approach was also adopted to interpret the results for the control variables.

The regression coefficients reported for the valuation model employed here are estimated by using *OLS* techniques. Coefficient standard errors are estimated by using White's (1980) heteroscedasticity-consistent standard errors and covariance estimates. Presented with the coefficient estimates are their associated probability values under a two-tailed t-test. The regression equation is computed using the statistical software 'Eviews' because of the availability of White's (1980) corrections in this program. The results for all annual cross-sections and pooled sample for all deflators used in this study are reported in Tables 5.3 to 5.10 and a summary of the results is presented in Table 5.11.

5.3 Descriptive Statistics

In order to test for the normality of the variables, with which this study is concerned, the descriptive statistics for each variable are computed using the statistical software 'Eviews'. Table 5.1 presents descriptive statistics for *MV*, *BV*, *E*, *CEXP*, *RD*, *D* and *CC* for the pooled sample. Panel A reveals descriptive statistics when the deflator is closing book value. Panel B displays descriptive statistics when the deflator is number of shares. Panel C reports descriptive statistics when sales are the deflator.

Panel D exhibits descriptive statistics when opening market value is the deflator. Descriptive statistics for *BV* are not presented when the deflator is closing book value. Descriptive statistics for *CC* have a negative sign because of the characteristics of *CC*, as the negative numbers imply a raising of capital. There are significant differences between mean and standard deviation for almost all of the variables, whatever the deflator. All of the deflated variables show signs of skewness (differences between mean and median values).

5.4 Correlation Matrix

To test the association between the variables under study and to measure the strength of the linear relationship of the dependent variable with the independent variables, sample correlation coefficients are calculated. The sample correlations are performed using the statistical software 'Eviews'. One of the assumptions of multiple regression equations is that there is no exact relationship between the independent variables. The possible indications of multicollinearity in an estimated model are high standard errors and low t-statistics combined with a very high R^2. High sample correlations between independent variables are also possible indications of multicollinearity. If multicollinearity exists, it is impossible to estimate the regression equation. Thus, the existence of multicollinearity makes it difficult to interpret the variation in the change of the dependent variable due to either of the two collinear independent variables.

Table 5.2 presents the correlations between independent variables for the pooled sample. Panel A presents the sample correlation between independent variables when closing book value is used as deflator. Panel B reveals the correlation

coefficients when number of shares is employed as deflator. Panel C reports sample correlations when sales are used as deflator and Panel D presents the correlations between independent variables when opening market value is used as deflator.

Table 5.2 reveals quite low correlation coefficients between all independent variables in the sample, whatever the deflator. Therefore, it can be argued that there is no multicollinearity problem in the regression equation.[16] The table shows that the highest correlation is 0.58, between book value (*BV*) and dividends (*D*) when number of shares is used as deflator. Overall, all of the correlation coefficients between the independent variables are less than 0.58 for all deflators used in this study.

5.5 Data Analysis

To examine the relationship between capital expenditures and the market value of the firm, we employ the following regression model as a simple extension of Akbar and Stark's (2003b) valuation models by including capital expenditures in their model.

$$\textit{Model 1: } MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon \qquad (3)$$

where *MV* is market value, *BV* is book value, *E* is earnings, *D* is dividends, *CEXP* is capital expenditures, *RD* is research and development expenditure and *CC* is capital contribution.

---

[16] Livnat and Zarowin (1990) argue that any correlations above 0.60 can be considered to have a severe multicollinearity problem in the data.

5.5.1 Results

The outcomes of the regression analysis are reported in Tables 5.3, 5.4, 5.5 and 5.6.[17] These tables present the results obtained from the estimated valuation model for four deflators: closing book value, numbers of shares, sales, and opening market value respectively. As mentioned in Chapter 3, these deflators are found in previous literature.[18]

Tables 5.3, 5.4, 5.5, and 5.6 display the results obtained from all regressions run for annual cross-sections and for the pooled sample. The outcomes suggest that the coefficient of capital expenditures (α_4) is consistently positive and statistically different from zero (at least at the 5% level) in most of the annual cross-sections and in the pooled sample for all deflators employed. As a consequence, the null hypothesis of this study, that the capital expenditures variable is not value relevant, is clearly rejected. Therefore, it can be argued that capital expenditures play a significant role in the market valuation of firms. These results are in line with the results of previous research (for example, McConnell and Muscarella (1985), Woolridge and Snow (1990), Al-Qudah (1991), Kerstein and Kim (1995), Rees (1997), Blose and Shieh (1997), Vogt (1997), Chung, Wright and Charoenwong (1998), Jones (2000) and Brailsford and Yeoh (2004), among others). All of these studies highlight a significant relationship between capital expenditures and the market value of firms.

---

[17] Table 5.3 presents the results when closing book value is used as deflator, Table 5.4 reveals the outcomes when number of shares is employed as deflator, Table 5.5 exhibits the results when sales are used as deflator and Table 5.6 displays the results when opening market value is employed as deflator. All of these tables provide results for all cross-sections and the pooled sample.

[18] See for instance, Hirschey (1982), Green, Stark and Thomas (1996), Rees (1997), Stark and Thomas (1998), Akbar (2001) and Akbar and Stark (2003b), among others.

The coefficient of book value (α_1) is consistently positive and statistically different from zero at the 1% level or better for all deflators. The coefficient of earnings (α_2) is positive in most of the annual cross-sections and statistically different from zero at the 5% level or better. Book value and earnings are significant in all annual cross-sections and the pooled sample for all deflators employed. The coefficient of dividends (α_3) is consistently positive and statistically significant (at least at the 1% level) in all annual cross-sections and the pooled sample, whatever the deflator employed. These results are consistent with those offered by previous research (for example, Green, Stark and Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003b), among others).

The coefficient (α_5) of research and development expenditures is positive and significantly different from zero at least at the 5% level or better in all annual cross-sections and for the pooled sample for all four deflators employed in this study. These results are in line with the results of previous research by Green, Stark and Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003b) regarding the valuation implications of closing book value and research and development expenditures in the UK. All of these studies report consistently positive and statistically significant coefficients on closing book value and research and development expenditures in the UK.

The variables are deflated using four different deflators (closing book value, number of shares, sales, and opening market value): all of these deflators are used in previous literature (for example, Hirschey 1985, Green, Stark and Thomas (1996), Stark and Thomas (1998), Rees (1997) and Akbar and Stark (2003b), among others). The idea behind this is to evaluate the robustness of the outcomes and the role

different deflators play in valuation studies. The results are nearly the same for all variables under investigation for the four different deflators. The main difference is in the values of R^2 because, when opening market value is used as a deflator, the values of R^2 are consistently negative, because there is no constant term in the deflated equations. This result is in accord with previous research results (for example, Wilson (1986, 1987), Burton, Lonie and Power (1999), Akbar and Stark (2003b) and Kim, Lyn, Park and Zychowincz (2005), among others). All of these studies reported negative values for R^2. Overall, however, the results remain the same. Apart from some changes in the values of some of the coefficients, neither their significance nor any other characteristic of the outcomes is changed. These results reinforce the results of Akbar and Stark (2003b).

5.5.2 Other Information Results

Following Akbar and Stark (2003b), this section examines whether the positive relationship between capital expenditures and the control variables included in the valuation model and the market value of firms will disappear if other information (*OI*) is included in the cross-sectional valuation model. To do so, following Akbar and Stark's (2003b) definition of other information, *OI* is estimated in the following way: for each deflator, for each cross-section for year *t*, *OI* is defined by:

$$OI_t = Defl_{t-1}\varepsilon_{t-1} \qquad (4)$$

The instinct for this procedure is that, first, 'other information' in an Ohlson (1989) framework is a function solely of the prior period's 'other information' plus a random error term. Thus, year *t-1* 'other information' is a noisy alternative for year *t* 'other information' (Akbar and Stark (2003b)). Second, and closely related to Ohlson (1989), a multiple of year *t-1* 'other information' can be thought of as the

valuation error, that is the differences between actual market value and an estimated market value that reflects the influence of important accounting variables thought to have value relevance. Akbar and Stark (2003b) suggest that the variables in equation (8) in their paper are indeed value relevant. As a consequence, we only include the accounting variables from our model above. Our proxy for OI_t is, therefore, the valuation error in year *t-1*, as defined in the equation above.

Then, for year *t*, we estimate the following cross-sectional regression as a simple extension of Akbar and Stark's (2003b) valuation models. In addition to other control variables, *OI* is included in their model as well.

$$\textit{Model 2: } MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon \quad (5)$$

This model is in deflated form, using the same deflator (for example, number of shares) as is used in proxying for OI_{t-1} but for year *t*.

The results presented in Tables 5.7, 5.8, 5.9, 5.10 and 5.11[19] suggest a number of implications. First, the addition of other information (*OI*) significantly adds to the explanatory power of all deflators employed. Table 5.11 reveals large values for R^2 after including *OI* in the valuation model. Second, the effect of adding *OI* to the regression equation reduces the coefficient of *E*, and increases the coefficients of *BV*, *CEXP*, and *CC*. This result can be observed for all deflators and for almost all of the annual cross-sections. As a consequence, the accounting variables in our analysis appear to be capturing some, but not all, of 'other information' when that variable is omitted, and third, most importantly, given the purposes of this section,

[19] Tables 5.7, 5.8, 5.9 and 5.10 present the results of the valuation model including other information variables for all cross-sections and the pooled sample for all four deflators. Table 5.11 displays a summary of the results obtained from the valuation models before and after adding in other information.

the coefficients of *D*, *CEXP*, *RD* remain resolutely positive and statistically different from zero, and of *CC*, negative and statistically different form zero. These results are consistent with those offered by Akbar and Stark (2003b).

5.6 Discussion

This section discusses the overall significance of these results and their corroboration with the existing literature. This study uses market value as the benchmark in order to investigate the value relevance of capital expenditures in the UK. As discussed in Chapter 2, the results observed in the existing literature are generally mixed and inconclusive. McConnell and Muscarella (1985) find that capital expenditures is significantly associated with stock market returns, whereas Livnat and Zarowin (1990) find that cash flow from investing activities are non-significantly associated with stock returns. Further, the results provided by Al-Qudah (1991) and Rees (1997) suggest a strong role for capital expenditures in the market valuation of UK firms, whilst Burton, Lonie and Power (1999) find non-significant results. However, Burton, Lonie and Power (1999) argue that the evidence presented in the existing literature is inconsistent and more research is needed on this issue.

The results of this chapter highlight a strong role of capital expenditures in equity valuation. In all annual cross-sections and the pooled sample for all deflators, the coefficients of capital expenditures are consistently positive and statistically significant. It can therefore be argued that capital expenditures play a dominant role in the valuation of firms. Most of the studies discussed in Chapter 2 have used returns models for establishing an association between capital expenditures and

abnormal stock market returns. As this chapter employs valuation models rather than returns, a direct comparison between the current research outcomes and those of the existing literature is therefore difficult. However, it is evident that the results in the current chapter are in line with those of previous literature (for example, McConnell and Muscarella (1985), Woolridge and Snow (1990), Al-Qudah (1991), Kerstein and Kim (1995), Rees (1997), Blose and Shieh (1997), Vogt (1997), Chung, Wright and Charoenwong (1998), Jones (2000), Brailsford and Yeoh (2004), and Kim, Lyn, Park and Zychwicz (2005), among others). These studies generally find evidence suggesting that capital expenditures have incremental information content.

As already highlighted above, there is little valuation literature on the information content of capital expenditures. To the best of my knowledge, only Rees (1997) employs valuation models for investing the value relevance of capital investment. Rees's (1997) results suggest a positive and significant relationship between capital investments and stock prices. It can therefore be argued that the results of this study are in line with Rees's (1997) research results.

In order to check the robustness of our results, this research project follows Akbar and Stark (2003b) and uses four different deflators. The use of four different deflators provides similar results in most of the annual cross-sections and the pooled sample. Apart from some changes in the values of some of the coefficients, neither their significance nor any other characteristic of the results is changed. This result can be considered to be one of main contributions of this study by considering the question of which deflator to use in valuation studies. This outcome is in accord with Akbar and Stark's (2003b) results. Christie (1987) concludes that there is no

particular deflator in valuation models. Given the lack of theory to support the choice of deflator, it can therefore be argued that this study provides a useful addition to the UK academic literature on deflator choice in accounting-based valuation models.

The addition of other information (*OI*) to the valuation model significantly adds to the explanatory power of the models for all deflators employed. Table 5.11 reveals large values for R^2 after the addition of other information to the model. The impact of adding other information (*OI*) to the regression equation above increases the coefficients of capital expenditures, book value and capital contributions and reduces the coefficient of earnings for most of the deflators employed. These results reinforce Akbar and Stark's (2003b) research results. In particular, the coefficient of capital expenditures increased when number of shares and opening market value are used as deflators and slightly decreased when closing book value and sales are employed as deflators. Overall, the coefficients of *BV, E, D, CEXP*, and *RD* remain positive and significant, and the coefficient of *CC* also remains negative and significant. It can be argued that other information (*OI*) should form part of all future valuation models.

5.7 Summary

This chapter examined the value relevance of capital expenditures. The results suggest a positive and statistically significant relationship between capital expenditures and the market value of firms. It can therefore be argued that capital expenditures play a significant role in market valuation. No significant change is observed in the results for any of the four deflators employed. The results also

suggest that the addition of other information to the valuation model significantly adds to the explanatory power for all deflators employed. The following chapter investigates the effects of capital expenditure announcements on stock market prices around the dates of announcements.

Table 5.1: Descriptive Statistics for *MV, BV, E, D, RD, CC*, and *CEXP* for the Pooled Sample

Panel A. Book Value as Deflator

Variable	*MV*	*BV*	*E*	*D*	*RD*	*CC*	*CEXP*
Mean	*2.938*	*NA*	*0.032*	*0.059*	*0.038*	*-0.102*	*0.178*
Median	*1.772*	*NA*	*0.111*	*0.045*	*0.000*	*0.030*	*0.107*
Maximum	*39.123*	*NA*	*2.868*	*1.516*	*1.833*	*2.607*	*15.048*
Minimum	*0.012*	*NA*	*-9.795*	*0.000*	*0.000*	*-4.929*	*0.000*
Std.Dev	*3.893*	*NA*	*0.608*	*0.091*	*0.134*	*0.463*	*0.420*

Panel B. Number of Shares as Deflator

Variable	*MV*	*BV*	*E*	*D*	*RD*	*CC*	*CEXP*
Mean	*2.104*	*1.170*	*0.102*	*0.058*	*0.019*	*-0.041*	*0.172*
Median	*1.330*	*0.670*	*0.079*	*0.034*	*0.000*	*0.020*	*0.069*
Maximum	*36.519*	*24.108*	*2.491*	*1.998*	*2.712*	*2.353*	*8.916*
Minimum	*0.010*	*0.005*	*-4.136*	*0.000*	*0.000*	*-5.454*	*0.000*
Std.Dev	*2.700*	*1.746*	*0.287*	*0.095*	*0.075*	*0.367*	*0.393*

Panel C. Sales as Deflator

Variable	*MV*	*BV*	*E*	*D*	*RD*	*CC*	*CEXP*
Mean	*1.852*	*0.875*	*-0.037*	*0.023*	*0.033*	*-0.156*	*0.137*
Median	*0.710*	*0.400*	*0.040*	*0.017*	*0.000*	*0.000*	*0.039*
Maximum	*39.950*	*18.970*	*0.793*	*0.478*	*2.641*	*0.800*	*28.123*
Minimum	*0.010*	*0.010*	*-9.030*	*0.000*	*0.000*	*-11.200*	*0.000*
Std.Dev	*3.926*	*1.780*	*0.552*	*0.033*	*0.174*	*0.813*	*0.727*

Panel D. Opening Market Value as Deflator

Variable	*MV*	*BV*	*E*	*D*	*RD*	*CC*	*CEXP*
Mean	*1.218*	*0.776*	*0.007*	*0.030*	*0.015*	*-0.059*	*0.103*
Median	*1.044*	*0.580*	*0.066*	*0.027*	*0.000*	*0.020*	*0.060*
Maximum	*15.819*	*10.326*	*4.380*	*0.795*	*1.950*	*1.543*	*6.632*
Minimum	*0.006*	*0.001*	*-7.632*	*0.000*	*0.000*	*-12.087*	*0.000*
Std.Dev	*0.982*	*0.758*	*0.350*	*0.034*	*0.065*	*0.425*	*0.184*

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures. The sample is drawn from the years 1990-2003.

Table 5.2: Correlations between Independent Variables for the Pooled Sample

Panel A. Book value as Deflator

Variables	BV	E	D	RD	CC	CEXP
BV	*NA*	*NA*	*NA*	*NA*	*NA*	*NA*
E	*NA*	*1.000*				
D	*NA*	*0.272*	*1.000*			
RD	*NA*	*-0.021*	*0.028*	*1.000*		
CC	*NA*	*0.224*	*0.254*	*-0.103*	*1.000*	
CEXP	*NA*	*-0.060*	*0.292*	*0.084*	*0.004*	*1.000*

Panel B. Number of Shares as Deflator

Variables	BV	E	D	RD	CC	CEXP
BV	*1.000*					
E	*0.370*	*1.000*				
D	*0.582*	*0.530*	*1.000*			
RD	*0.134*	*0.111*	*0.062*	*1.000*		
CC	*0.016*	*0.181*	*0.231*	*-0.046*	*1.000*	
CEXP	*0.523*	*0.272*	*0.493*	*0.063*	*0.014*	*1.000*

Panel C. Sales as Deflator

Variables	BV	E	D	RD	CC	CEXP
BV	*1.000*					
E	*-0.342*	*1.000*				
D	*0.105*	*0.194*	*1.000*			
RD	*0.371*	*-0.207*	*-0.097*	*1.000*		
CC	*-0.355*	*0.284*	*0.122*	*-0.187*	*1.000*	
CEXP	*0.328*	*-0.136*	*-0.026*	*0.139*	*-0.123*	*1.000*

Panel D. Opening Market Value as Deflator

Variables	BV	E	D	RD	CC	CEXP
BV	*1.000*					
E	*-0.101*	*1.000*				
D	*0.235*	*0.246*	*1.000*			
RD	*0.089*	*-0.031*	*-0.052*	*1.000*		
CC	*-0.151*	*0.160*	*0.165*	*-0.043*	*1.000*	
CEXP	*0.340*	*-0.042*	*0.138*	*-0.005*	*-0.126*	*1.000*

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures.
Correlation statistics are calculated for all observations with data available. The sample is drawn from the years 1990-2003.

Table 5.3: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Book Value as Deflator)

Model 1: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const.	1474.8	2230.5	2410.9	2333.9	3189.7	1780.2	3050.3	4690.1	3015.0	4113.6	4512.0	1755.1	2312.7	2566.4	2474.2
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.43	0.76	0.66	0.71	0.86	0.77	1.36	0.73	1.42	1.85	1.63	1.47	0.80	1.41	1.27
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.49	0.78	0.47	0.94	0.43	0.28	1.78	0.57	0.17	2.45	1.16	0.15	0.10	-0.04	0.58
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.04)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.70)	(0.00)
D	14.98	11.49	17.72	21.86	22.67	17.35	4.10	21.08	11.17	5.47	8.20	4.84	11.32	16.45	13.54
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.83	0.95	0.92	1.64	0.94	2.82	1.97	1.93	2.24	2.23	0.26	0.42	0.65	1.36	0.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
RD	3.01	6.31	6.48	9.97	5.18	11.46	9.13	5.91	5.88	8.07	4.59	1.58	1.76	3.34	6.04
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.48	-0.32	-0.94	-1.35	-1.01	-1.79	-2.38	-1.10	-0.57	-2.22	-1.55	-0.41	-1.13	-0.11	-1.38
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
R^2	0.33	0.31	0.50	0.34	0.48	0.36	0.31	0.32	0.24	0.27	0.27	0.21	0.31	0.34	0.27
Cases	910	921	914	948	970	986	1134	1261	1232	1117	1099	1169	1080	1113	14854

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.4: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Number of Shares as Deflator)

Model 1: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	1181.7	837.7	1896.4	3687.4	1870.7	961.38	1386.72	1898.6	1330.15	1606.31	1317.78	905.09	822.84	826.18	1035.90
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.05)	(0.00)	(0.01)	(0.03)	(0.00)	(0.01)	(0.28)	(0.05)	(0.01)
BV	0.49	0.86	0.52	0.86	0.52	0.43	0.32	0.82	0.49	0.51	0.54	0.74	0.40	0.52	0.51
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.38	0.43	-0.55	0.53	0.67	1.75	0.66	1.57	2.36	2.96	1.68	1.14	0.97	1.11	1.68
(p-value)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
D	9.34	6.83	20.16	11.13	15.26	12.67	16.41	8.27	8.58	20.94	11.13	9.58	11.76	17.69	9.32
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.78	1.47	1.06	3.06	0.80	2.01	1.79	1.01	1.22	2.28	0.68	0.86	1.22	0.62	0.65
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.03)	(0.02)	(0.01)	(0.01)	(0.00)
RD	1.93	5.49	2.89	6.02	7.14	5.54	9.94	4.64	4.27	7.91	8.03	3.68	2.66	2.50	4.70
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
CC	-0.23	-0.72	-1.73	-1.57	-0.81	-1.25	-1.19	-1.62	-1.75	-2.97	-1.87	-0.86	-1.12	-0.59	-1.53
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
R^2	0.48	0.40	0.47	0.46	0.64	0.57	0.44	0.40	0.34	0.30	0.41	0.55	0.61	0.60	0.38
Cases	904	910	908	935	967	977	1129	1235	1189	1060	1048	1134	1056	1107	14559

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.5: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Sales as Deflator)

Model 1: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	642.6	1812.9	1453.9	3542.5	3347.2	1819.8	2579.2	2196.8	3139.0	2481.3	2571.4	2417.7	842.5	3070.4	1153.31
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.39	0.44	0.35	0.35	0.32	0.60	0.71	0.75	0.62	1.07	0.85	0.68	0.57	0.60	0.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.35	1.77	0.70	0.56	0.96	1.31	-0.72	-0.79	0.65	0.70	-0.87	0.63	0.18	-0.07	0.43
(p-value)	(0.18)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.47)	(0.02)
D	14.37	4.23	18.83	16.71	13.18	13.51	7.77	9.44	9.34	5.40	5.86	3.70	7.60	12.48	14.99
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
CEXP	0.76	0.44	0.58	1.85	2.30	0.95	0.87	2.50	2.18	0.66	1.27	0.40	1.23	4.19	0.39
(p-value)	(0.00)	(0.04)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
RD	8.05	9.48	8.85	9.13	2.62	9.63	13.03	6.62	5.34	5.62	4.64	2.40	1.01	3.29	4.62
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.84	-1.34	-0.91	-1.14	-1.38	-1.15	-1.24	-0.95	-1.23	-1.26	-0.61	-0.53	-0.51	-0.69	-0.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.49	0.52	0.47	0.54	0.46	0.47	0.51	0.55	0.46	0.32	0.42	0.44	0.46	0.47	0.43
Cases	907	918	911	948	968	982	1128	1154	1212	1109	1095	1159	1072	1111	14674

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.6: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Opening Market Value as Deflator)

$$\textit{Model 1: } MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	690.56	1357.38	1756.34	3750.53	1757.66	1057.04	2005.48	1837.52	1935.46	4629.40	1839.65	1384.18	866.20	2061.42	1803.15
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.25	0.15	0.37	0.36	0.23	0.41	0.56	0.29	0.30	0.28	0.35	0.48	0.50	0.22	0.40
(p-value)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
E	2.05	1.40	1.01	0.30	-0.20	0.79	1.55	0.49	0.49	0.86	0.65	0.12	0.30	-0.32	0.14
(p-value)	(0.03)	(0.00)	(0.01)	(0.12)	(0.38)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.08)	(0.00)	(0.04)	(0.03)
D	7.49	13.21	8.71	13.70	19.14	16.11	5.14	7.39	7.34	5.09	9.49	5.95	0.51	13.92	9.17
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)
CEXP	0.48	0.55	0.79	0.78	1.52	0.98	1.41	1.42	1/47	1.15	0.73	0.32	0.74	1.05	0.74
(p-value)	(0.02)	(0.06)	(0.13)	(0.12)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.04)	(0.00)
RD	3.07	3.79	6.20	4.93	5.42	5.84	4.67	4.16	3.38	7.77	6.21	1.31	0.94	1.24	1.57
(p-value)	(0.01)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.01)	(0.01)	(0.00)
CC	-0.75	-1.17	-2.11	-0.98	-1.00	-1.19	-1.30	-0.88	-0.92	-2.52	-1.39	-0.31	-0.52	-1.17	-0.66
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)
R^2	-0.58	-0.32	-0.02	-0.16	-0.25	-0.46	-0.20	-0.47	-0.36	0.06	-0.07	-0.35	-0.04	-0.37	-0.22
Cases	890	906	904	932	954	980	1082	1222	1209	1098	1052	1123	1064	1112	14528

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; and CEXP is capital expenditures. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.7: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Book Value as Deflator)

Model 2: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1005.4	2185.5	2349.6	3258.5	3370.4	2268.1	3388.1	4533.3	3717.0	4118.5	4583.5	2110.7	2358.8	2475.5	2693.70
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.60	0.51	0.48	0.72	1.09	1.31	1.48	0.78	1.01	1.31	1.93	1.01	0.60	1.14	1.37
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.66	1.19	0.35	0.80	0.86	0.45	1.61	0.45	0.58	1.40	1.02	0.64	0.24	-0.69	0.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)	(0.00)
D	16.35	10.44	16.84	17.99	18.09	17.31	6.62	24.82	10.91	6.82	8.33	6.61	12.87	17.60	13.98
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.82	0.96	0.77	1.21	0.90	1.48	1.92	1.93	1.24	1.84	0.26	0.45	0.56	0.85	0.71
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.78)	(0.00)	(0.00)	(0.00)	(0.00)
RD	2.89	5.85	6.47	4.60	7.79	11.51	10.10	7.34	6.14	8.65	4.80	1.08	1.53	3.78	5.46
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.41	-1.01	-1.10	-1.18	-1.10	-1.61	-1.23	-1.21	-0.73	-1.39	-1.33	-0.87	-1.51	-1.06	-1.29
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.50	0.51	0.45	0.64	0.54	0.50	0.61	0.38	0.40	1.12	0.34	0.51	0.97	0.92	0.40
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.15)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.42	0.31	0.40	0.45	0.49	0.39	0.33	0.38	0.26	0.29	0.27	0.19	0.30	0.36	0.42
Cases	910	921	914	948	970	986	1134	1261	1232	1117	1099	1169	1080	1113	14854

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.8: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Number of Shares as Deflator)

Model 2: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1900.4	616.7	521.0	1420.9	1032.4	1614.32	1906.09	3853.30	2225.51	1860.74	2232.26	2016.88	2807.22	1091.85	1196.31
(p-value)	(0.00)	(0.00)	(0.00)	(0.0.9)	(0.01)	(0.06)	(0.00)	(0.00)	(0.02)	(0.00)	(0.16)	(0.06)	(0.00)	(0.00)	(0.00)
BV	0.80	0.87	0.67	0.81	0.89	0.42	0.48	0.30	0.42	0.63	0.51	0.50	0.33	0.53	0.46
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.53	0.81	0.47	-0.89	0.87	2.81	0.76	0.67	2.56	1.27	0.87	0.24	0.34	0.97	1.38
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)	(0.00)	(0.26)	(0.22)	(0.12)	(0.00)	(0.00)
D	10.76	7.15	17.14	15.82	19.77	10.20	12.10	17.64	9.92	21.58	14.04	13.06	12.05	15.45	9.73
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.47	0.47	0.73	0.57	0.54	1.10	1.34	0.54	0.90	1.33	0.63	1.23	1.78	1.04	0.70
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.21)	(0.00)	(0.30)	(0.02)	(0.00)	(0.28)	(0.00)	(0.00)	(0.00)	(0.00)
RD	1.83	3.62	4.69	2.63	7.42	6.07	10.07	6.56	5.89	3.34	10.11	5.49	2.32	2.42	5.11
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)
CC	-0.28	-0.63	-1.09	-1.25	-0.86	-1.30	-0.88	-1.50	-1.33	-1.29	-1.67	-0.57	-0.88	-0.59	-1.41
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.70	0.70	0.58	0.51	0.54	0.71	0.53	0.97	0.79	0.83	-0.03	0.090	0.82	0.95	0.39
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.08)
R^2	0.65	0.52	0.59	0.53	0.64	0.68	0.64	0.70	0.64	0.64	0.39	0.62	0.71	0.88	0.50
Cases	904	910	908	935	967	977	1129	1235	1189	1060	1048	1134	1056	1107	14559

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.9: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Sales as Deflator)

Model 2: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1710.0	1810.5	1282.9	2399.3	2072.6	1373.9	1212.6	1166.5	1858.8	2192.3	3815.1	2699.6	1634.3	3091.6	1139.15
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.19	0.45	0.28	0.27	0.32	0.57	0.99	0.52	0.38	2.30	1.97	0.77	0.50	1.89	0.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.40	1.64	0.86	0.53	1.58	0.80	-0.98	0.48	0.28	3.56	3.04	0.61	0.35	-0.70	0.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
D	18.18	4.62	18.77	21.45	16.68	15.05	5.64	8.72	5.87	5.15	5.39	5.93	5.70	12.48	14.83
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.78	0.56	0.85	1.15	1.09	0.79	0.58	2.85	1.49	0.71	1.91	0.67	1.70	4.04	0.39
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
RD	5.89	9.60	8.28	7.99	6.01	10.04	9.17	8.86	2.57	1.87	2.14	3.89	1.36	3.60	4.59
(p-value)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.39	-1.47	-0.98	-1.77	-0.34	-0.87	-1.18	-0.47	-0.72	-0.88	-1.13	-0.58	-0.41	-0.66	-0.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)
OI	0.36	0.37	0.41	0.23	0.44	0.55	0.86	0.83	0.84	1.50	1.47	0.39	0.24	1.33	0.02
(p-value)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
R^2	0.32	0.46	0.48	0.23	0.46	0.40	0.42	0.43	0.38	0.27	0.38	0.46	0.45	0.48	0.43
Cases	907	918	911	948	968	982	1128	1154	1212	1109	1095	1159	1072	1111	14674

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.10: Results from the Estimation Model for the Years 1990-2003 and the Pooled Sample (Opening Market Value as Deflator)

Model 2: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	925.05	1084.99	1497.28	2822.31	1653.66	762.92	2364.11	1408.88	1465.55	3946.96	2067.87	1343.74	946.90	1249.95	1706.74
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.36	0.23	0.40	0.38	0.31	0.48	0.49	0.36	0.37	0.33	0.41	0.47	0.35	0.21	0.48
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
E	1.42	0.62	0.35	0.25	-0.45	0.51	1.44	0.37	0.35	0.56	0.45	0.11	0.08	-0.28	-0.06
(p-value)	(0.00)	(0.04)	(0.32)	(0.22)	(0.02)	(0.04)	(0.00)	(0.04)	(0.04)	(0.01)	(0.02)	(0.18)	(0.30)	(0.04)	(0.36)
D	8.32	13.18	9.65	11.85	19.36	14.94	4.94	7.16	7.25	4.06	8.26	5.90	10.15	11.75	8.42
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
CEXP	0.65	0.41	1.18	0.81	1.65	1.04	1.54	1.67	1.64	1.47	0.97	0.47	0.59	1.50	0.88
(p-value)	(0.00)	(0.02)	(0.01)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
RD	3.76	4.52	6.02	5.39	5.01	6.96	3.72	4.30	3.61	6.48	6.40	1.95	1.48	1.19	2.18
(p-value)	(0.00)	(0.04)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
CC	-0.64	-1.11	-1.68	-0.92	-0.78	-0.76	-1.22	-0.66	-0.69	-1.91	-1.00	-0.31	-0.64	-1.24	-0.60
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.29	0.27	0.45	0.29	0.72	0.53	0.32	0.30	0.30	0.42	0.63	0.10	0.08	0.38	0.34
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.42	0.02	0.19	-0.30	-0.07	-0.06	-0.30	-0.21	-0.12	0.08	0.21	-0.26	0.16	0.07	-0.11
Cases	890	906	904	932	954	980	1082	1222	1209	1098	1052	1123	1064	1112	14528

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 5.11: Summary of the Results of Estimating Models of Corporate Valuation on Pooled Data for 1990-2003.

Model 1: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \varepsilon$

Model 2: $MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$

Panel A: Book Value as deflator

Variable	*Const.*	*BV*	*E*	*D*	*CEXP*	*RD*	*CC*	*OI*	R^2	*No. of Obs.*
Model 1	2474.21	1.27	0.59	13.54	0.84	6.04	-1.38		0.27	14854
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Model 2	2693.66	1.37	0.43	13.98	0.71	5.46	-1.29	0.40	0.42	14854
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Panel B: Number of Shares as deflator

Variable	*Const.*	*BV*	*E*	*D*	*CEXP*	*RD*	*CC*	*OI*	R^2	*No. of Obs.*
Model 1	1162.12	0.52	1.60	9.10	0.61	4.64	-1.52		0.39	14559
(p-value)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)			
Model 2	1018.34	0.48	1.30	9.54	0.68	5.08	-1.41	0.38	0.51	14559
(p-value)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Panel C: Sales as deflator

Variable	*Const.*	*BV*	*E*	*D*	*CEXP*	*RD*	*CC*	*OI*	R^2	*No. of Obs.*
Model 1	1153.31	0.85	0.43	14.99	0.40	4.62	-0.85		0.43	14674
(p-value)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)			
Model 2	1139.15	0.85	0.42	14.83	0.39	4.59	-0.85	0.02	0.43	14674
(p-value)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)		

Panel D: Opening Market Value as deflator

Variable	*Const.*	*BV*	*E*	*D*	*CEXP*	*RD*	*CC*	*OI*	R^2	*No. of Obs.*
Model 1	1803.15	0.40	0.14	9.17	0.74	1.57	-0.66		-0.22	14528
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)			
Model 2	1706.74	0.48	-0.06	8.42	0.88	2.18	-0.60	0.34	-0.11	14528
(p-value)	(0.00)	(0.00)	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) correction.

Chapter 6

The Effect of Capital expenditure Announcements on the Market Value of Firms

6.1 Introduction

Chapter 5 analysed the value relevance of capital expenditures. This chapter investigates the effects of announcements of capital expenditure decisions on the stock market returns surrounding the announcement date. The central concern of this chapter is to find answers to questions raised in Chapter 5: first, when managers announce their corporate capital expenditures decisions, does the market respond by revaluing their firms' securities? And does the market respond in a way that is consistent with the hypothesis that managers seek to maximise the market value of their firms? In short, the key objective of the current chapter is to analyse the market values of UK firms around the time at which they reveal information about their capital expenditures plans. To attain such an objective, this chapter adopts an 'event time' analysis of the common stock prices of a large sample of companies that made public announcements about their capital expenditure plans over the period 1990 to 2003.

As discussed in Chapter 2, the vast majority of empirical studies suggest that stock market prices reflect all publicly available information and respond quickly to the release of new information that may affect the risk and return of securities. This phenomenon is normally investigated by assessing the reaction of stock market prices to corporate events. Previous studies have revealed that stock market prices

adjust upward (downward) to increase (decrease) in capital expenditures on the day of the announcement and fluctuate in random fashion thereafter, indicating that the information in capital expenditures news are fully impounded in the stock price on the day of the announcement (for example, McConnell and Muscarella (1985), Woolridge (1988), Woolridge and Snow (1990), Chan, Martin and Kesinger (1990), Al-Qudah (1991), Chan, Gau and Wang (1995), Chung, Wright and Charoenwong (1998), Burton, Lonie and Power (1999), Jones (2000) and Kim, Lyn, Park and Zychowincz (2005), among others).

The rest of the chapter is organised as follows. The next section highlights the research approach. Section 6.3 presents the results. Section 6.4 provides a brief discussion of the results and, lastly, section 6.5 concludes the chapter by describing the main findings discussed in the results.

6.2 The Research Approach

The impact of an event on the value of a firm's common stock is usually assessed by measuring the difference between the actual and expected returns on the stock during a relevant time period surrounding the event (McConnell and Muscarella (1985), Woolridge and Snow (1990) and Jones (2000), among others). To investigate the effect of capital expenditures announcements on security prices, the sample of capital investment decisions are arranged in 'event time' around the day of the announcement of capital investment decisions.

The majority of capital expenditures research that investigates market valuation effects uses daily data (for example, Dyckman, Philbrick and Stephen (1984), McConnell and Muscarella (1985), Woolridge (1988), Chan, Martin and Kensinger

(1990), Chaney and Devinney (1992), Szewczyk, Testeskos and Zantout (1996), Vogt (1997), Chen and Ho (1997), Chung, Wright and Charoenwong (1998), Burton, Lonie and Power (1999), Jones (2000), Del-Brio, Perote and Pindado (2003), Brailsford, and Yeoh (2004) and Kim, Lyn, Park and Zychowicz (2005), among others). The analysis in this chapter is performed on daily data. This is because researchers appear to prefer daily data to monthly data in detecting abnormal returns in event studies (Dodd and Warner (1983), Brown and Warner (1985) and Woolridge (1988)) and using daily data allows a consistent comparison of results with existing studies. Daily data generally result in more powerful tests than monthly data. Brown and Warner (1985) conclude that the use of daily data in event studies is '*straightforward*'.

An adjusted-market returns method has been used to estimate abnormal stock returns. Dodd and Warner (1983), Brown and Warner (1980, 1985), Dyckman, Philbrick and Stephen (1984) and (Jones (2000) generally conclude that there is no evidence that more complicated models perform better than simple models. Among these studies, Brown and Warner (1985) argue that the market-adjusted returns approach is as powerful as other restrictive models of expected stock returns in detecting significant stock price movements associated with specific events. In this study, abnormal stock returns are calculated using the following equation:

$$AR_{it} = R_{it} - R_{mt} \qquad (6)$$

where,

AR_{it} : abnormal returns of i^{th} stock at period t,

R_{it} : observed returns of i^{th} stock at period t, and

R_{mt} : market returns at period t.

This chapter adopts the most commonly used technique for calculating cumulative abnormal returns pioneered by Fama, Fisher, Jensen and Roll (1969). This approach is represented as follows:

$$CAR_T = \sum_{t=1}^{T} ARpt \qquad (7)$$

where,

AR_{pt} : average portfolio abnormal returns for period t.

In the case of daily returns, the *CAR* technique aggregates average abnormal returns over time for T periods, for example, ten days prior to the capital expenditures announcement, abbreviated as (t-10), to ten days after the announcement day, (t+10). Each period's average abnormal returns consists of individual security abnormal returns at various points beginning with (t-10) relative to the actual announcements date and ending with (t+10) (Del-Brio, Perote and Pindado (2003), among others).

Many different windows are found in the existing literature. For instance, two days (McConnell and Muscarella (1985), Woolridge (1988) Woolridge and Snow (1990), Chan, Gau and Wang (1995), Vogt (1997) and Burton, Lonie and Power (1999)), three days before and after the event day (Wilson (1987), Chaney and Devinney (1992) and Jones (2000)), ten days prior to and after event day in Del-Brio Perote and Pindado (2003), five days prior to and after the announcement day in Brailsford and Yeoh (2004), four days before and after the event day in Kim, Lyn, Park and Zychowicz (2005), among others. Our window is five days prior to and after (-5, +5) the announcement day. The post-event period (1, 5) is intended to control for any market reaction, which could take place gradually because of the capital expenditure

news. We also selected a pre-event period (-5, -1) in case any information leakages had taken place prior to the capital expenditure announcements. .

6.3 Results

To determine whether the market reacts to any announcement associated with investment decisions, we tested the null hypothesis of zero abnormal returns on the announcement day. Table 6.1 reveals the average abnormal returns (*AR*) and cumulative abnormal returns (*CAR*) associated with the 884 capital expenditures announcements over the period January 1990 and December 2003. It also displays the associated test statistics for each day in the event period (-5, +5). The results presented in Table 6.1 suggest positive and significant abnormal returns on the day of the announcement. The results highlight that the mean abnormal returns is higher on the day of the announcement than the mean abnormal returns on any of the 5 days prior to or after the announcement day.

These results are consistent with previous research results (for example, McConnell and Muscarella (1985), Woolridge (1988), Chan, Martin and Kensinger (1990), Woolridge and Snow (1990), Al-Qudah (1991), Chaney and Devinney (1992), Chan, Gau and Wang (1995), Jones (2000) and Kim, Lyn, Park and Zychowicz (2005), among others), but inconsistent with the results of Burton, Lonie and Power (1999), Bhattacharya, Daouk, Jorgenson and Kehr (2000) and Del-Brio, Perote and Pindado (2003), who find evidence suggesting that capital investment announcements do not convey new information to the market once they are released to the public.

In addition, the mean of *CARs* and *CARs* over the event window are presented in Figures 6.1 and 6.2 respectively. The mean *CARs* for the entire window are

relatively flat, in particular, for the pre-announcement and post-announcement periods, as shown in Figure 6.1. Figure 6.2 presents a very clear picture of the positive relationship between *CARs* and capital expenditure announcement on the event day. Therefore, the null hypothesis that mean abnormal returns on the day of the announcement are zero can be rejected in favour of the alternative hypothesis that capital expenditure announcements significantly impact the valuation of shares at the 1% level or better. In other words, the null hypothesis of no change in the market value of common stock can be rejected at least at the 5% level of significance according to the difference of means test. The results have several implications for strategic management research and practice. They indicate a very clear and strong relationship between capital expenditure announcements and stock market valuation.

The time windows selected are $CAR_{(-5,-1)}$, $CAR_{(+1,+5)}$ and $CAR_{(-5,+5)}$, which provide the cumulative average abnormal returns for pre-event, post-event and the whole event period. *CARs* are calculated around the event date, $CAR_{(-1,+1)}$, and some shorter windows. Table 6.2 summarises the *CAR* and t-statistics for the selected windows. The results highlight that firms that announce capital expenditures experience a significant positive cumulative abnormal return (*CAR*) over the (-1, +1) and (–1, 0) day windows. Overall, these findings suggest that capital expenditures announcement information is being impounded in the stock price on the day of the announcement. These results provide evidence that the appropriate event window would be to investigate returns on the announcement day.

As discussed in Chapter 2, previous literature has highlighted that announcements of increase (decrease) in capital expenditures are associated with positive (negative)

abnormal stock returns (McConnell and Muscarella (1985), Blackwell, Marr and Spivey (1990), Al-Qudah (1991), Gobola and Tsetsetkos (1992) and Jones (2000), among others). It has also been suggested that announcements of decrease in capital expenditures are associated with positive abnormal stock returns (Statman and Sepe (1989), Denning and Shatri (1990), Afshar, Taffler and Sudersanam (1992) and Kalra, Henderson and Walker (1994), among others). Del-Brio, Perote and Pindado (2003) suggest that neither announcements of increase nor announcements of decrease in capital expenditures affect stock market returns. Therefore, it can be argued that the previous literature which has investigated this issue suggests mixed and inconclusive results.

In this study, the announcements are split into announcements of increase and announcements of decrease in capital expenditures for further investigation. Multi-year announcements are excluded from the sample because it is not clear whether to classify them as either increases or decreases from previous budgets. In some cases, wherein the text made no reference to the previous year's capital expenditures, the firm's annual reports from the prior year is consulted to determine whether the announcement represents an increase or a decrease from the previous year's capital expenditures.

Table 6.3 highlights different results. Panel A presents the results for both announcements of increase and decrease in capital expenditures. In the case of announcements of increase in capital expenditures, the results suggest a positive and significant relationship between announcements of increase in capital expenditures and abnormal stock returns. For announcements of decrease in capital expenditures, there are negative and significant abnormal stock returns. These results are

consistent with previous research findings (for example, McConnell and Muscarella (1985), Al-Qudah (1991) and Jones (2000), among others). Overall, these results are in line with the predictions of the market value maximisation hypothesis, which predicts that an announcement of an increase in capital expenditures should have a positive impact on the market value of the firm, whereas an announcement of a decrease in capital expenditure should have a negative impact on the market value of the firm.

As a further investigation, the statistical tests are performed for the different sub-samples arranged according to the intended use of funds. The results are reported in Panel B of Table 6.3. The results suggest positive and significant abnormal stock returns for announcements of expenditure on plant, equipment and machinery. They also highlight some evidence of the value relevance of other groups. These results are consistent with the results of McConnell and Muscarella (1985), Woolridge (1988) and Jones (2000). It can be argued that there is no significant difference among the different projects of capital expenditures that a firm may undertake.

6.4 Discussion

This section provides a discussion of the results highlighted above. It presents the overall significance of these findings and their corroboration with the existing literature. Chapter 2 highlighted previous studies which investigate the impact of capital expenditure announcements on stock market prices have focused on the manner in which stock markets react to capital expenditure news, and the different characteristics of firms and their capital investment which affect the market response. Among these studies, McConnell and Muscarella (1985), Woolridge

(1988) and Woolridge and Snow (1990) examine the stock market reaction to capital expenditure announcements in the US. Al-Qudah (1991) and Burton, Lonie and Power (1999) investigate UK stock market reaction to capital expenditures announcements. Del-Brio, Perote and Pindado (2003) study the impact of corporate capital investment announcements in the Spanish market. Brailsford and Yeoh (2004) examine stock market reaction to capital expenditures announcements in the Australian market and Kim, Lyn, Park and Zychowicz (2005) investigate the impact of capital investment announcements on stock prices in the Korean market. Most of these studies use event study methodology and find evidence suggesting a positive and significant stock market reaction to capital spending announcements on or around the day of the announcements.

This chapter analysed stock market prices around the date of capital expenditures announcements. The results suggest a significant and positive relationship between capital spending announcements and share prices. The results further highlight that market participants do react to corporate capital expenditures announcements by reassessing the market value of the firms that make public announcements of their capital expenditures plans. Given the information contained in the announcement, the market reaction is consistent with the hypothesis that managers seek to maximise the market value of the firm in making corporate capital expenditures decisions. Market participants also respond positively to corporate capital expenditures decisions regardless of the types of projects in which the funds are to be invested. These results are in line with previous research outcomes (for example, McConnell and Muscarella (1985), Woolridge (1988), Chan, Martin and Kensinger (1990), Woolridge and Snow (1990), Al-Qudah (1991), Chaney and Devinney (1992), Chan, Gau and Wang (1995), Jones (2000), and Kim, Lyn, Park and Zychowicz (2005),

among others). All of these studies document a significant positive market reaction to the announcements of capital expenditures.

Overall, the results suggest a significant relationship between capital expenditure announcements and stock market prices. However, this chapter dealt with stock market reactions to announcements of capital expenditure decisions and not to the outcomes of those decisions. Announcements are intended strategies that can either be realised or unrealised and these intended strategies may be modified during implementation (Mintzberg and Waters (1985) and (Mintezberg (1978), among others). It would be helpful for future researchers to track a set of announced decisions, determine the outcomes of those decisions and attempt to assess when and how much market valuation changed.

6.5 Summary

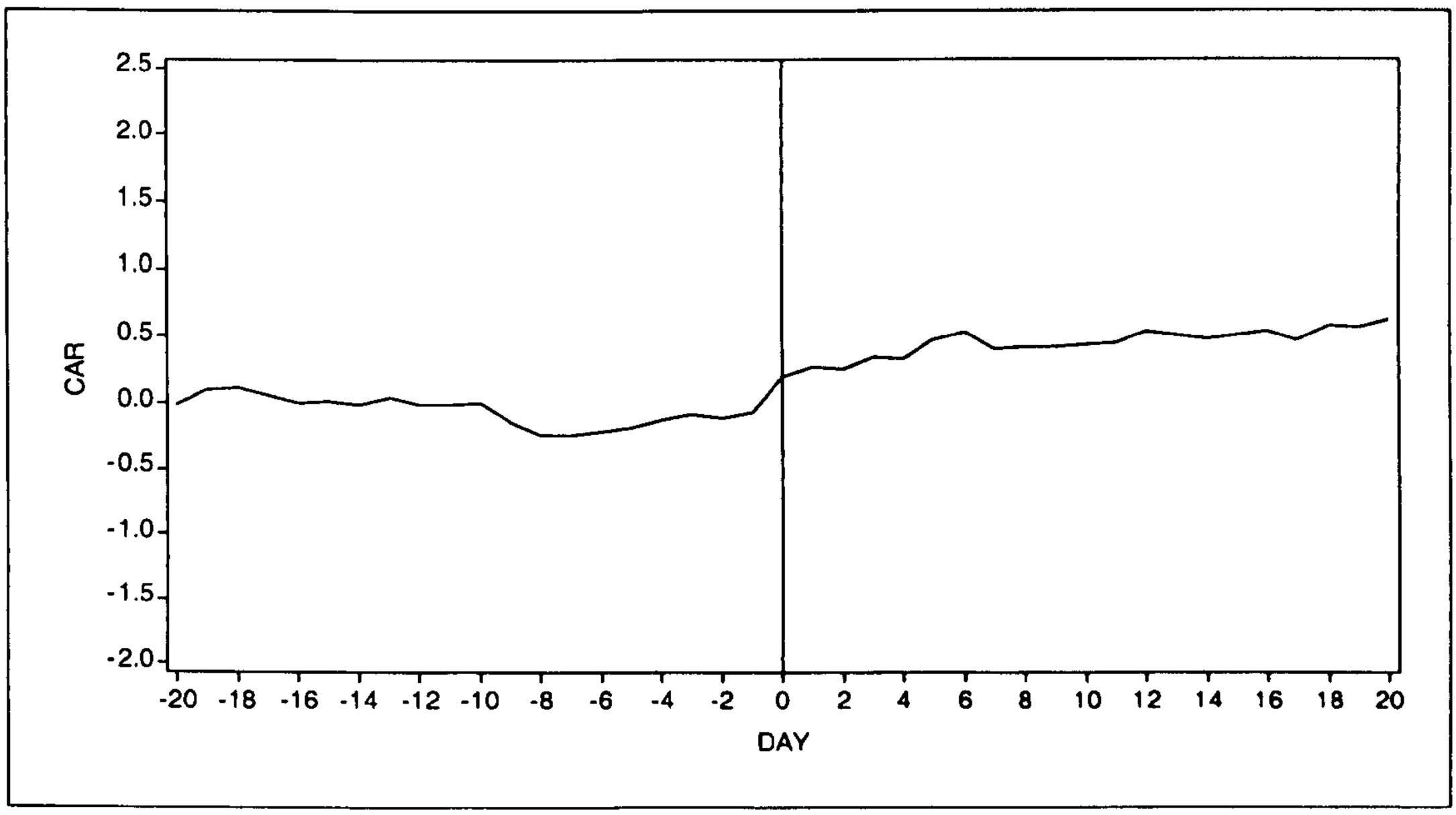
This chapter examined stock market returns around the date of capital expenditure announcements. In addition, the statistical tests are performed on different types of announcements (increases and decreases in capital expenditures). The results suggest a statistically significant relationship between capital expenditure announcements and stock market returns. Chapter 7 examines the impact of capital expenditures on the market value of firms in different sub-samples. The sample is reorganised into different groups based on size, manufacturing and non-manufacturing and profit and loss-making firms.

Table 6.1: Mean Abnormal Returns and Cumulative Abnormal Returns

Day	AR	t-stat	AB>0	CAR	t-stat
-5	0.0351	0.53	45.1	-0.1811	-0.73
-4	0.0543	0.78	48.2	-0.1272	-0.51
-3	0.0474	0.63	45.8	-0.0802	-0.32
-2	-0.0381	-0.52	46.0	-0.1183	-0.49
-1	0.0466	0.65	52.0	-0.0723	-0.27
0	0.2715***	3.08	57.9	0.1992	0.70
1	0.0619	0.68	49.4	0.2601	0.88
2	-0.0071	-0.06	48.9	0.2530	0.80
3	0.0812	1.16	47.5	0.3342	1.04
4	-0.0093	-0.14	42.9	0.3251	1.00
5	0.1394*	1.81	45.1	0.4635	1.42

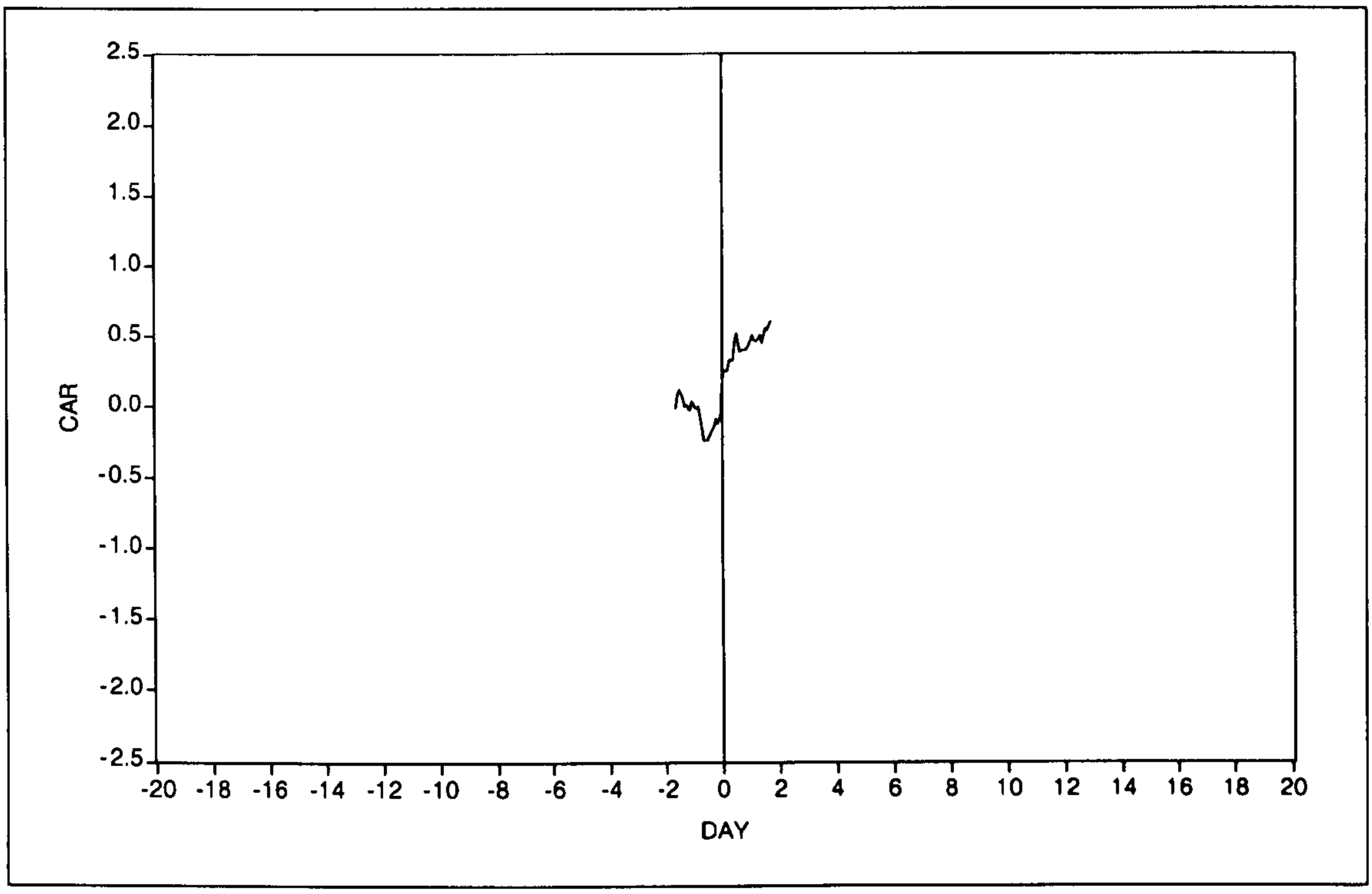
AR is abnormal returns, CAR is cumulative returns and AR>0 is the percentage of positive abnormal returns, and it is tested for statistical difference from 50% using a non-parametric binomial test. *, *** Represent the 10% and 1% levels of significance, respectively.

Figure 6.1: Mean CARs for the Full Sample*



* This graph shows mean CARs for 20 days before and after announcement day. Mean CARs for this period are presented in Appendix 4.

Figure 6.2: CARs for the Full Sample*



* CARs for 20 days before and after announcement day are presented in Appendix 4.

Table 6.2: Summary of CARs for the Full Sample

Selected windows	Mean CARs (%)	St.Dev.	t-statistic
(-5, +5)	*0.475*	*0.048*	*0.07*
(-5, +1)	*0.679*	*0.059*	*1.77**
(-1, +1)	*0.378*	*0.034*	*2.73***
(-1, 0)	*0.317*	*0.028*	*2.69***

*, ** denote significance at the 5% and 1% levels, respectively.

Table 6.3: Summary of Analysis of Announcement Period Common Stock Returns

Panel A: by type

Category	N	Mean	Median	St.Dev.	Min.	Max.
Increases	*528*	*0.034****	*0.032****	*0.0950*	*-0.2231*	*0.3353*
Decreases	*230*	*-0.039****	*-0.038****	*0.0667*	*-0.3137*	*0.2076*

Panel B: by intended use of funds

Unspecified	*487*	*0.083****	*0.068****	*0.0928*	*-0.0154*	*0.4262*
Plant, Equipment & Machinery	*196*	*0.036***	*0.035***	*0.0824*	*-0.2231*	*0.2713*
Exploration & Development	*115*	*0.008*	*0.006*	*0.0881*	*-0.2191*	*0.3287*
Retail Stores	*86*	*0.009*	*0.005*	*0.0920*	*-0.1963*	*0.2861*

N is number of observations, **, *** denote significance at the 5% and 1% level, respectively. The significance levels reported are for a t-test of the mean and a Wilcoxon test of the median.

Chapter 7

The Value Relevance of Capital expenditures in Different Sectors

7.1 Introduction

Chapter 6 analysed the impact of capital expenditure announcements on the market value of the firm. This chapter investigates the impact of capital expenditures on the market value of firms in different sectors. The sub-sampling takes place in the context that different sectors in the population under study have different characteristics that may affect conclusions regarding the value relevance of capital expenditures. Thus, there is a possibility that capital expenditures may be value relevant for one sector or group of firms such as small, medium or large firms but not for another sector or group.

As highlighted in Chapter 2, the impact of capital expenditures on the market value of the firm in different sectors has not been investigated to date in the UK from a cross-sectional valuation perspective. Such an investigation is the main purpose of this chapter. To do so, we first examine the impact of capital expenditures on corporate value in small, medium, and large firms; second, in manufacturing and non-manufacturing firms; and third, in profit and loss-making firms.

The rest of the chapter is outlined as follows. Section 7.2 highlights the research approach. Section 7.3 describes the sample reorganisation. Section 7.4 reports the results in four different sub-sections. Sub-section 7.4.1 presents the results for size-based analysis. Sub-section 7.4.2 provides the outcomes for manufacturing and non-

manufacturing-based analysis. Sub-section 7.4.3 produces the results for profit and loss-making firms-based analysis. Sub-section 7.4.4 highlights some other interesting results. Section 7.5 provides a brief discussion of the results and finally, section 7.6 concludes the chapter in brief summary.

7.2 The Research Approach

The research approach adopted in this chapter examines and analyses the valuation model on different samples of firms arranged depending on size, sector and profit and loss-making firms for the years 1990 to 2003. The results are presented for the pooled sample in Tables 7.1, 7.2 and 7.3. The results for all cross-sections are provided in Appendices (17-44). The results are present for all different sub-samples which are based on size, manufacturing and non-manufacturing and profit and loss-making firms. Following Akbar and Stark (2003b), the valuation model employed here is estimated in deflated form. This chapter also uses ordinary least squares (*OLS*) techniques to estimate the coefficients of our regression equations; coefficient standard errors are estimated using the White (1980) standard error approach.

The discussion is based on the findings of an extension of Akbar and Stark's (2003b) valuation models on all 14 annual cross-sections and the pooled samples. We adopted Akbar's (2001) approach to interpret the results, which is as follows. A non-zero coefficient of capital expenditures is interpreted as its value relevance. This approach is also adopted to interpret the results for the control variables. The regression equations are computed using the statistical software 'Eviews' because of the availability of White's (1980) corrections in this program. The values of R^2 reported for all annual cross-sections and the pooled sample are for all the deflated

forms of the model. Reported with them are their associated probability values under a two-tailed t-test.

7.3 Reorganising the Sample into Different Sub-Samples

In order to examine the value relevance of capital expenditures in different sectors, the sample is rearranged in three different ways. First, the reformation is done by splitting the sample into small, medium and large firms based on their market value. This reconstruction is provided in Appendices 5, 6, 7 and 8. The purpose of this reforming is to examine whether or not the value relevance of capital expenditures is affected by firm size.

Second, the reorganisation is done by dividing the sample into manufacturing and non-manufacturing firms. This reformation is presented in Appendices 9, 10, 11 and 12. As highlighted in Chapter 2, firms in the manufacturing sector have different features than those in the non-manufacturing sector. These differences may affect the value relevance of capital expenditures in both groups and may provide different results.

Third, the sample is split into firms in which earnings are positive and those firms in which earnings are negative. Frequency distributions of these sub-samples are provided in Appendices 13, 14, 15 and 16. The purpose of this reorganisation is to investigate whether the value relevance of capital expenditures is affected by the information content of losses and the information content of profits.

7.4 Results

7.4.1 Size-Based Analysis Results

Size-based analysis outcomes are presented in Table 7.1.[20] This table shows that the coefficients of capital expenditures are positive and statistically significant at the 5% level or better for all four deflators. The results suggest that the coefficients of capital expenditures are higher in the large firms than the other sizes. These results suggest a stronger relationship between capital expenditures and the market value of large firms than medium and small firms. One possible explanation for this is that the large firms may have more free cash flow to invest than small and medium firms. This result is in accord with Woolridge and Snow's (1990) research findings. Overall, these results provide some evidence of the value relevance of capital expenditures in different size firms in the UK, where limited literature on this issue is to be found.

7.4.2 Manufacturing and Non-Manufacturing Firms-Based Analysis Results

The results for manufacturing and non-manufacturing firms-based analysis are provided in Table 7.2[21], which shows that almost all of the coefficients of capital expenditures are positive and statistically significant, at least at the 1% level or better. In the case of manufacturing firms, all of the coefficients of capital

---

[20] Table 7.1 reveals the results for the pooled sample: for cross-section results, see Appendices 17, 18 and 19 for book value as deflator; Appendices 24, 25 and 26 for number of shares as deflator; Appendices 31, 32 and 33 for sales as deflator; and Appendices 38, 39 and 40 for opening market value as deflator.

[21] Table 7.2 exhibits the results for the pooled sample: for cross-section results, see Appendices 20 and 21 for book value as deflator; Appendices 27 and 28 for number of shares as deflator; Appendices 34 and 35 for sales as deflator; and Appendices 41 and 42 for opening market value as deflator.

expenditures are positive and statistically significant at the 1% level or better, whichever deflator is employed. These outcomes suggest a significant role for capital expenditures in the market valuation of the manufacturing firms. For non-manufacturing firms, the coefficients of capital expenditures are positive and significant but are low relative to manufacturing firms.

This result seems reasonable due to the evident fact that firms included in the manufacturing sector include, for example, heavy engineering, electrical and electronic equipments, computer hardware and automobiles. Most of these manufacturing sectors provide goods that are durable. Thus, the consistently positive and significant coefficients of capital expenditures, whatever the deflator, for the manufacturing firms suggest that capital expenditures is an important factor and has a strong effect on stock market prices in this sector. Overall, these results provide strong evidence of the value relevance of capital expenditures in the manufacturing sector and weak evidence of the value relevance of capital expenditures in the non-manufacturing sector.

These results are consistent with previous research results: for example, Assiri (1993) investigates the impact of capital expenditures on stock prices in 21 different sectors. The results reveal that the coefficients of capital expenditures are significant for some sectors and non-significant for others. Akbar (2001) investigates the value relevance of components of earnings and book value in manufacturing and non-manufacturing firms. He reports positive and significant results for manufacturing and negative and non-significant results for non-manufacturing firms. Therefore, it can be argued that firms behave differently according to the type of project they undertake. If the firm is in the manufacturing

sector, such as the engineering industry, the level of investment changes more than in other sectors. Depreciation in these firms is quite high, which increases the level of the replaced assets. Manufacturing firms also consider stock market reaction for their investment decisions and mainly take into account past capital expenditures and the level of cash flow.

7.4.3 Profit and Loss-Based Analysis Results

The outcomes of profit and loss-based analysis are reported in Table 7.3.[22] The results suggest that the coefficients of capital expenditures for profit and loss-making firms are positive and statistically significant at the 5% level or better. The coefficients of capital expenditures for loss-making firms are higher than those for profit-making firms. The high coefficients for the loss-making firms may be attributable to those loss-making firms being faced with difficulties in establishing themselves and remaining in the market. In short, the findings suggest that some evidence of the value relevance of capital expenditures is found in the profit-making and loss-making firms.

7.4.4 Other Findings

In addition to the above discussions, there are various results in relation to other control variables, such as research and development expenditures (*RD*), dividends (*D*), and capital contribution (*CC*). These results are further highlighted below.

---

[22] Table 7.3 displays the results for the pooled sample: for cross-section results, see Appendices 22 and 23 for book value as deflator; Appendices 29 and 30 for number of shares as deflator; Appendices 36 and 37 for sales as deflator; and Appendices 43 and 44 for opening market value as deflator.

The existing literature on research and development expenditure suggests that these expenditures might have different effects on market value across firms.[23] UK evidence on research and development expenditures highlights the point that these expenditures contribute, on average, to the values of firms.[24] The results regarding research and development expenditures in all the sub-samples are briefly described in the following.

The outcomes of size-based analysis suggest that for all three types of firms, the coefficients of research and development expenditures are positive and statistically significant at the 5% level or better, whatever the deflator. Table 7.1 suggests that the coefficient of research and development is higher for large firms than for the other two types (small and medium). One possible interpretation is that the coefficient of research and development spending is high for large firms because large firms have more resources and capital to invest than small and medium firms.

The results of the manufacturing versus non-manufacturing analyses reveal that the coefficients of research and development expenditures for manufacturing firms are positive and statistically significant at the 1% level or better, whichever the deflator employed. Table 7.2 shows that the coefficients of research and development expenditures for manufacturing sectors are higher than for non-manufacturing sectors. One possible explanation for this could be that manufacturing firms invest in research and development expenditures more than non-manufacturing firms.

---

[23] See, for example, Griliches (1981), Ben-Zion (1984), Pakes (1985), Chan, Martin and Kensinger (1990), Connolly and Hirschey (1990), Hirschey and Spencer (1992), Hall (1993), Chauvin and Hirschey (1993), Sougiannis (1994), and Zantout and Tsetsekos (1994).

[24] See for example, Green, Stark and Thomas (1996), Stark and Thomas (1998) and Akbar and Stark (2003b).

Overall, the above results provide strong evidence of the value relevance of research and development expenditures for manufacturing sectors.

The results for profit and loss-making firms suggest that the coefficients of research and development expenditures for both groups are positive and statistically significant at the level of 5% or better for all four deflators employed. Overall, the above results provide evidence that the research and development expenditures are value relevant in the two groups (profit and loss-making firms). Table 7.3 exhibits that the coefficients of research and development expenditures are higher for loss-making firms than for profit-making firms, because loss-making firms face difficulties in establishing themselves in the market and can attain this aim mainly through research and development expenditures. The stock market recognises this point and therefore places more weight on research and development expenditures for loss-making firms than profit-making firms (Akbar, 2001). Overall, these results reinforce the previous results of Green, Stark and Thomas (1996), Stark and Thomas (1998), Akbar (2001), and Akbar and Stark (2003b). In addition, the coefficients of dividends and capital contributions for all three bases are consistently positive and negative, respectively, and significant, whatever the deflator employed. These results confirm Akbar and Stark's (2003b) research results.

7.5 Discussion

In addition to the cross-sectional and pooled sample analyses employed in Chapter 5, this chapter investigated the value relevance of capital expenditures in different sub-samples. Stock market reaction to capital expenditures in different sub-samples has been investigated in some previous studies: for example, McConnell and

Muscarella (1985) and Blose and Shieh (1997) focus on industrial and public utility firms, and Woolridge and Snow (1990) and Livnat and Zarowin (1990) study small and large firms. Chan, Gau and Wang (1995) and Chung, Wright and Charoenwong (1998) distinguish between high versus low-technology firms. Kerstein and Kim (1995), Chambers, Jennings and Thompson (1999) and Kim, Lyn, Park and Zychowicz (2005) focus on manufacturing firms. Al-Qudah (1991) and Burton, Lonie and Power (1999) study all industry groups. Born and Ryan (2000) analyse the gas and oil industry and Kim (2001) distinguishes between firms with positive earnings and firms with negative earnings. These studies find mixed and inconclusive results. There also exists an important line of research, which tries to identify the market response to R&D expenditures.[25] These studies typically find that investments in R&D are positively valued by the market, although the valuation varies according to firm size and industry.

Most of the above studies report significant differences between groups. However, it is evident from the above that there is little research in the UK conducted using such an analysis. So far, only Al-Qudah (1991), Rees (1997) and Burton, Lonie and Power (1999) have investigated this issue on all industry firms. This study has conducted three different analyses, a size-based analysis, and analyses of manufacturing versus non-manufacturing firms and profit versus loss-making firms. For the size-based analysis, the sample is split into small, medium and large firms.

The results reported in section 7.4.1 suggest that most of the coefficients of capital

---

[25] Some relevant studies are Griliches (1981), Pakes (1985), Jose, Nichols and Stevens (1986), Cockburn and Griliches (1988), Hall (1993), Sougiannis (1994), Zantout and Tsetsekos (1994), Green, Stark and Thomas (1996), and Goodacre and McGrath (1997). More recently, Chan, Lakonishok and Sougiannis (1999) have tried to extend the scope of this research area by analysing whether stock prices reflect the market value of all of a firm's intangible assets. However, once more the lack of suitable data forces the authors to basically analyse R&D expenses.

expenditures are positive and significant in small, medium and large firms. This outcome is in line with the previous research results of Woolridge and Snow (1990) and Livnat and Zarowin (1990) who find similar results for small and large firms. Overall, the results are almost the same as those in Chapter 5, except for some changes in the values of some coefficients. In the case of large firms, the coefficient of capital expenditures is higher than that for small firms. This is because large firms have more free cash flow to spend on capital expenditures than other firms. Overall, the coefficients of capital expenditures are positive and statistically significant for all firm sizes. This result confirms the results in Chapter 5. It can therefore be argued that there is no role for size in the market valuation of UK firms.

This chapter examines the value relevance of capital expenditures in manufacturing firms versus non-manufacturing firms. The results reported in section 7.4.2 suggest strong evidence of the value relevance of capital expenditures in the manufacturing firms while weak evidence is reported for non-manufacturing firms. This result, for manufacturing firms, is in line with the previous research results of Kerstein and Kim (1995), Chambers, Jennings and Thompson (1999) and Kim, Lyn, Park and Zychowicz (2005). All of these studies find evidence on the value relevance of capital expenditures in manufacturing firms. Further, the coefficients of capital expenditures for manufacturing firms are higher than those for non-manufacturing firms. This finding seems reasonable due to the obvious fact that manufacturing firms provide durable goods and depreciation in these firms is quite high, which increases the level of replaced assets. Therefore, it can be argued that capital expenditures plays an important role in the market valuation of manufacturing rather than non-manufacturing firms.

The results based on profit and loss-making firms suggest evidence of the value relevance of capital expenditures in both groups. These outcomes are again in line with Kim (2001), who finds evidence suggesting that capital expenditures plays a significant role in the valuation of both groups (profit and loss-making firms). For the control variables included in the valuation model used in this study, the results are similar to those reported in Chapter 5. Most of these results are again in accord with previous research results (for example, Green, Stark and Thomas (1996), Rees (1997), Stark and Thomas (1998) and Akbar and Stark (2003), among others).[26] In addition, the results for all four deflators remain almost the same. This result reinforces the results highlighted in Chapter 5 and again is in line with Akbar and Stark's (2003b) research results. Overall, in the light of the discussion above, it can be concluded that first, the value relevance of capital expenditures is not affected by the size of firms. Second, some evidence is found of the value relevance of capital expenditures in the manufacturing sector in comparison to the non-manufacturing sector, and third, capital expenditures play a significant role in the market valuation of the profit and the loss-making firms.

7.6 Summary

This chapter has investigated the value relevance of capital expenditures in different sub-samples. The chapter conducted three different analyses: size-based analysis, and analyses of manufacturing versus non-manufacturing firms and profit versus loss-making firms. The sub-sample results suggest no role for size; however, some evidence was reported on the value relevance of capital expenditures in the

[26] Green, Thomas and Stark (1996) examine the value relevance of research and development expenditures, Rees (1997) studies the value relevance of dividend, debt and capital investment, Stark and Thomas (1998) investigate the market valuation of residual income, and Akbar and Stark (2003b) examine the value relevance of net shareholder cash flows, dividend and capital contributions.

manufacturing sector in comparison to the non-manufacturing one. The chapter also highlighted some evidence of the value relevance of capital expenditures in the profit and loss-making firms. In addition, no significant changes were observed in the results for all four deflators. The following Chapter provides a summary of the conclusions, and also implications, limitations and scope for future research.

Table 7.1: Small, Medium and Large Firms: Results from the Estimation Model for Pooled Samples for Various Deflators

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	*BV as Deflator*			*NS as Deflator*			*SA as Deflator*			*OMV as Deflator*		
	Small Firms	*Medium Firms*	*Large Firms*	*Small Firms*	*Medium Firms*	*Large Firms*	*Small Firms*	*Medium Firms*	*Large Firms*	*Small Firms*	*Medium Firms*	*Large Firms*
Constant	321.07	1178.59	2215.48	489.31	1245.90	5076.29	357.81	128.27	1262.61	824.70	933.90	1971.95
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.68	1.72	3.65	0.89	0.59	0.40	0.07	0.07	0.86	0.26	0.21	0.53
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.02	0.49	0.42	0.71	0.41	1.57	0.03	0.03	-0.62	0.13	0.21	-0.12
(p value)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.01)	(0.11)
D	2.83	10.98	10.39	3.19	1.86	8.42	2.30	1.23	17.73	4.93	12.22	9.52
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.76)	(0.00)
CEXP	0.08	0.78	0.80	0.55	0.72	0.74	0.17	0.08	0.43	0.41	0.82	1.10
(p value)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)
RD	0.21	3.92	4.47	0.86	0.83	4.74	0.30	0.63	4.48	0.69	2.05	2.28
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)
CC	-0.48	-1.10	-1.07	-1.15	-0.52	-1.46	-0.07	-0.05	-0.92	-0.31	-0.79	-0.53
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.32	0.12	0.38	0.60	0.51	0.50	0.02	0.00	0.04	0.02	0.63	0.81
(p value)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.02)	(0.00)	(0.00)
R^2	0.11	0.40	0.33	0.33	0.24	0.33	0.15	0.07	0.30	-1.95	-1.35	-0.15
No. of Obs.	4947	4947	4960	4848	4848	4863	4887	4887	4900	4837	4837	4854

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; OI is other information; NS is number of shares; SA is sales; and OMV is opening market value. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 7.2: Manufacturing and Non-Manufacturing Firms: Results from the Estimation Model for Pooled Samples for Various Deflators

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	*BV as Deflator*		*NS as Deflator*		*SA as Deflator*		*OMV as Deflator*	
	Pooled Man. Firms	*Pooled Non-Man. Firms*	*Pooled Man. Firms*	*Pooled Non-Man. Firms*	*Pooled Man. Firms*	*Pooled Non-Man. Firms*	*Pooled Man. Firms*	*Pooled Non-Man. Firms*
Constant	3896.2	3606.4	1179.7	424.7	2772.8	1280.42	1694.36	1568.60
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.68	1.37	0.22	0.37	0.90	0.84	0.51	0.61
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.53	0.48	0.89	1.16	-0.62	0.11	-0.18	-0.07
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.05)	(0.43)
D	19.53	15.46	8.03	9.71	12.93	3.80	10.34	4.72
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	1.19	0.95	0.68	0.74	1.50	0.25	0.74	0.59
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	9.08	5.75	7.96	7.20	7.54	0.88	4.91	2.53
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-1.34	-1.06	-1.06	-1.31	-0.77	-0.71	-0.80	-0.40
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.49	0.43	0.44	0.49	0.18	0.11	0.43	0.33
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.53	0.41	0.58	0.53	0.53	0.45	-0.14	-0.11
No. of Obs.	8680	6174	8498	6061	8573	6101	8474	6054

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; OI is other information; NS is number of shares; SA is sales; and OMV is opening market value. All regressions are performed using White's (1980) heteroscedasticity correction.

Table 7.3: Loss and Profit-Making Firms: Results from the Estimation Model for Pooled Samples for Various Deflators

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	*BV as Deflator*		*NS as Deflator*		*SA as Deflator*		*OMV as Deflator*	
	Pooled Loss -Making Firms	*Pooled Profit -Making Firms*	*Pooled Loss -Making Firms*	*Pooled Profit -Making Firms*	*Pooled Loss -Making Firms*	*Pooled Profit -Making Firms*	*Pooled Loss -Making Firms*	*Pooled Profit -Making Firms*
Constant	2281.51	2304.71	1513.09	4868.47	1251.85	985.50	1397.74	1523.88
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	1.43	0.84	0.52	0.20	0.77	0.68	0.53	0.40
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.17	6.41	-0.29	4.66	-0.73	9.76	-0.23	1.66
(p value)	(0.14)	(0.00)	(0.27)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	7.09	8.06	6.75	6.07	11.26	-2.04	3.54	7.30
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.25)	(0.00)	(0.00)
CEXP	0.85	0.30	0.87	0.41	0.36	0.85	0.49	0.80
(p value)	(0.01)	(0.18)	(0.00)	(0.04)	(0.02)	(0.02)	(0.02)	(0.00)
RD	3.92	2.64	5.73	3.21	4.38	3.64	1.24	1.50
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.02)
CC	-1.00	-1.21	-1.38	-1.08	-0.78	-1.21	-0.60	-0.56
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.30	0.47	0.37	0.33	0.02	0.03	0.22	0.52
(p value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)
R^2	0.35	0.52	0.43	0.60	0.44	0.46	-0.10	-0.19
No. of Obs.	3183	11671	3149	11410	3172	11502	3115	11413

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; OI is other information; NS is number of shares; SA is sales; and OMV is opening market value. All regressions are performed using White's (1980) heteroscedasticity correction.

Chapter 8

Conclusion

8.1 Introduction

This study is concerned with the valuation relevance of capital expenditures. The purpose of this study is to provide evidence of the valuation relevance of capital expenditures in the UK capital market. Previous research, using mostly US data, generally suggests the valuation relevance of capital expenditures, but overall the available empirical evidence is mixed and inconclusive.

Building on the previous research themes just noted, the main purposes of this research are: (i) to examine the association between capital expenditures and the market value of firms, (ii) to investigate the impact of capital expenditures announcements on the stock market returns, and (iii) to examine potential differences regarding the value relevance of capital expenditures for different firm sizes, firm sectors and firm performances.

The sample of UK companies that we examine covers the period 1990-2003. Our sample consists of all UK-listed non-financial companies (both live and dead) for which data is available. To remove extreme values from the sample, we applied conventional 0.5% deletion criteria. To investigate the value relevance of capital expenditures, cross-sectional valuation models (in deflated form) are employed in this study. This thesis also uses event study methodology to examine the effects of announcements of capital expenditures decisions on share prices surrounding the

announcements dates. The Ordinary Least Square (*OLS*) technique is used to explain the relationship between the dependent variable and various control variables. We report the p value (probability values) under a two-tailed t-test along with slope coefficients. This chapter summarises the main findings of the thesis and highlights the research contributions. It also discusses the study's limitations and identities areas for further research.

8.2 Summary of Results

As discussed in Chapter 2, several previous studies provide empirical evidence on the relevance of capital expenditures for equity valuation. Most of these studies focus on single country settings (normally having used US data). Research on this issue in the UK is considerably limited, both in the number of papers and in the time span of data analysed. Previous research reports contradictory and indecisive results (for example, McConnell and Muscarella (1985), Livnat and Zarowin (1990), Al-Qudah (1991), Rees (1997), Burton, Lonie and Power (1999) and Jones (2000), among others).

By using a sample of UK firms for the period above, the current study highlights that the market places a significant value on capital expenditures during the period studied. In other words, the results suggest that capital expenditures play an important role in the market valuation of firms. The results are also quite robust both in coefficient significance and overall explanatory power. Our results provide more consistent empirical evidence of valuation relevance for capital expenditures. These results are also consistent with previous research results (for example, McConnell and Muscarella (1985), Woolridge (1988), Chan, Martin and Kensinger

(1990), Woolridge and Snow (1990), Al-Qudah (1991), Chaney and Devinney (1992), Chan, Gau and Wang (1995), Jones (2000), Brailsford and Yeoh (2004) and Kim, Lyn, Park and Zychowicz (2005), among others).

The results for other control variables (book value, earnings, dividends, and research and development expenditure) are consistently positive and significant in most of the annual cross-sections and the pooled sample. These results are in line with previous research results (for example, Garrod and Hadi (1995), Green, Stark and Thomas (1996), Rees (1997), Stark and Thomas (1998) and Akbar and Stark (2003b), among others). The results also highlight that capital contribution is consistently negative and significant. This finding reinforces Akbar and Stark's (2003b) findings.

The addition of other information (*OI*) to our valuation model significantly adds to the explanatory power of the model. The results reported large values of R^2 after including *OI* in the regression equation. These results reinforce Akbar and Stark's (2003b) research results. It can be argued that other information (*OI*) should form part of all future valuation models. The results of this study highlight that the use of four different deflators (book value, number of shares, sales and opening market value) provide similar results in most of the annual cross-sections and the pooled sample.

This study presents a positive and significant relationship between capital expenditures announcements and stock market prices. These results are in line with the conventional economic assumption that the announcement of an anticipated increase (decrease) in planned capital expenditures causes stock market prices to

increase (decrease) provided that the market accepts (consistently with the objective of maximising shareholder wealth) that the projects in question have positive net present values. The results also highlight that market participants do react to corporate capital expenditure announcements by reassessing the market value of firms that make public announcements of their capital expenditures plans. Given the information contained in the announcement, the market reaction is consistent with the hypothesis that managers seek to maximise the market value of the firm in making corporate capital expenditures decisions. Market participants also respond positively to corporate capital expenditure announcements regardless of the types of projects in which the funds are to be invested. These results confirm the previous research results (for example, McConnell and Muscarella (1985), Woolridge (1988), Chan, Martin and Kensinger (1990), Woolridge and Snow (1990), Al-Qudah (1991), Chaney and Devinney (1992), Chan, Gau and Wang (1995), Chen and Ho (1997), Jones (2000), and Kim, Lyn, Park and Zychowicz (2005), among others). All of these studies document a significant positive market reaction to the announcement of capital expenditures.

Prior research, such as by Woolridge and Snow (1990), Livnat and Zarowin (1990), Burton, Lonie and Power (1999), Chambers, Jennings and Thompson (1999), Collins Pincus and Xie (1999), Kim (2001), and Kim, Lyn, Park and Zychowicz (2005), among others, suggest the potential for differences in the effectiveness of capital expenditures for small and large firms, manufacturing and non-manufacturing firms as well as profit and loss-making firms.

The results of our analysis on sub-samples provide some additional evidence that the market attaches different values to capital expenditures in different size firms (small,

medium and large), different sectors (manufacturing and non-manufacturing) and in firms with different performances (profit-making and loss-making firms). Overall, the sub-sample results of this study suggest no role for size: however, some evidence is highlighted that suggests a greater value relevance of capital expenditures in the manufacturing firms in comparison to the non-manufacturing ones. The sub-sample results also find evidence suggesting a significant role for capital expenditures in the market value of both the profit-making and loss-making firms.

8.3 Contributions

This study contributes in a number of ways. One of the major contributions of this research is that it adds to the very limited research available on capital expenditures in the UK. This study uses a valuation model that includes both balance sheet (stock measures) as well as income statement variables (flow measures). According to Ohlson (1995), a model that includes a stock measure of value and a flow measure of earnings might better explain the market value of a firm. This study also uses event time methodology to examine the impact of capital expenditures announcements on share prices.

The second contribution of this study is the use of a sub-sampling approach. In Chapter 7, the analysis is based on different sub-samples of the main sample.[27] This analysis provides additional evidence which produces different conclusions concerning the main issue examined in this study.

---

[27] The main sample is divided into different sub-samples depending on three criteria; size, sectors, and status for each deflator. First, we divided the main sample into three sub-samples (small, medium, and large firms). Second, we divided the main sample into two sub-samples (manufacturing and non-manufacturing firms). Finally, we divided the main sample into two sub-samples (loss and profit-making firms).

The third contribution of this study is the inclusion of dead firms in the sample. The existing literature mostly includes live companies for analysis and is therefore fronted with the problem of survivorship bias. Thus, here an endeavour is made to minimise survivorship bias as much as possible.

The use of four different deflators provides similar results, most of the time, which can also be regarded as a fourth contribution by considering the question of which deflator to use in valuation studies. Here, no significant change was observed in the results for all four deflators. Given the lack of theory to support the choice of deflator, it can be argued that this study provides a useful addition to the UK academic literature on deflator choice in accounting-based valuation studies.

Fifth, the rationale of this study consists basically of constructing a proper scenario to measure the market response to capital expenditure announcements in the UK. This study provides new evidence of the value relevance of capital expenditures to add to the limited amount of evidence previously available concerning UK firms. This study also makes a valuable contribution to the knowledge of European financial market reactions to capital investment announcements, since there are as yet no conclusive results in the literature.

Sixth, in addition, this study also contributes to the UK academic literature through re-evaluating and extending the continued significance of financial statement items. The results in general show that financial statement signals, which are examined in this study, have incremental information content.

Overall, this thesis represents a substantial extension of the existing literature concerning the market valuation of announcements of capital expenditures. Such

announcements represent potentially valuable news to investors concerning the future earnings of a firm.

8.4 Limitations of the Study

No work can attain absolute accomplishment in any regard. There will be some limitations in every piece of work carried out (Stewart and Furse, 1984). Likewise, there are some limitations to this study. The first possible limitation is regarding the valuation models employed in this study. Due to limited theoretical development based upon empirical data, it is difficult to formulate a valuation model that can be defended unequivocally (Akbar, 2001). In addition, Ohlson's (1989) linear information dynamics is a time series model for one firm and we have employed it here to examine a cross-section. As a result, model misspecification problems are a possibility, which could give rise to erroneous conclusions. Therefore, the results of this study might be affected by model misspecification problems.

The second limitation is related to the significance tests when using Ordinary Least Squares (*OLS*) regression equations in this study. When using *OLS*, we assume that the error terms are independent of each other (i.e. no cross-sectional dependency exists). We also assume that the error terms have the same variance (i.e. homoscedasticity). This study used the procedures suggested by previous research, for example Bernard (1987), and White's (1980) correction for heteroscedasticity in all regression equations, but the correction may be not complete.

8.5 Scope of Future Research

The existence of few value relevance studies of the UK capital market itself highlights the need for further research. There is also scope for further development of this analysis. This study provides evidence suggesting that capital expenditures play an important role in the market valuation of UK firms. Future research could benefit from these results and investigate the impact of capital expenditures on the market value of firms in other capital markets. The research framework adopted in this study could provide the basis for such research to be carried out in other countries.

This study is based on a large sample containing different industries, thus one could test the validity of these results by examining the valuation effect of accounting and financial variables on an industry-to-industry basis. Further, the investigation of the value relevance of capital expenditures on sub-samples of UK firms suggests future research possibilities. The splitting of the sample could be done using other sub-samples and in different ways, such as industrial versus public utility firms and high versus low-technology firms.

Further, it might be worthwhile to examine the value relevance of capital expenditures by either interview or questionnaires. Such approaches could provide more valuable insights about the management perception of the value relevance of capital expenditures and a better understanding of the investors' responses. In addition, the combination of quantitative and qualitative methods could complement each other in searching for the value relevance of accounting and financial variables.

Finally, the thesis and its findings pave the way for further research in this area. The results demonstrate new insights into the area of market-based accounting research, and into the value relevance of accounting and financial variables. However, there is much work that remains to be done.

Appendices

Appendix 1: List of Industry Sectors Included in the Sample, Total Observations for Each Cross-Section (1990-2003)

Industry Sector	INDC	Live Firms	Dead Firms	Total
AEROSPACE	AEROS	8	11	19
AIRLINES & AIRPORTS	AIRLN	9	5	14
AUTO PARTS	AUPRT	15	10	25
AUTOMOBILE	AUTOS	0	2	2
BIOTECHNOLOGY	BIOTC	28	5	33
BUILDING & CONSTRUCTION MATERIALS	BMATS	24	35	59
BUILDERS MERCHANTS	BMERC	9	14	23
BEVERAGES – BREWERS	BREWS	2	5	7
BUSINESS SUPPORT SERVICES	BUSUP	108	47	155
CHEMICALS, COMMODITY	CHEMS	1	11	12
CHEMICALS, ADVANCED MATERIALS	CHMAV	10	4	14
CHEMICALS, SPECIALITY	CHMSP	13	18	31
CLOTHING & FOOTWEAR	CLTHG	16	21	37
COMPUTER SERVICES	CMPSV	45	20	65
CONSUMER ELECTRONICS	CNELE	4	22	26
COMMERCIAL VEHICLES & TRUCKS	COMMV	3	1	4
COMPUTER HARDWARE	COMPH	11	6	17
DEFENCE	DEFEN	5	1	6
DELIVERY SERVICES	DELSV	1	11	12
BEVERAGES - DISTILLERS & VINTNERS	DISTV	6	8	14
DIVERSIFIED INDUSTRIES	DIVIN	5	21	26
DISCOUNT & SUPERSTORES AND WAREHOUSES	DSCST	1	2	3
VEHICLE DISTRIBUTION	DSVHL	10	21	31
EDUCATION - BUSINESS TRAINING & EMPLOYMENT	EDUTR	37	10	47
ELECTRICITY	ELECT	7	35	42
ELECTRICAL EQUIPMENT	ELEQP	15	19	34
ELECTRONIC EQUIPMENT	ELETR	31	58	89
ENGINEERING CONTRACTORS	ENGCO	12	11	23
ENGINEERING FABRICATORS	ENGFA	11	16	27
ENGINEERING GENERAL	ENGIN	41	53	94
RETAILERS E-COMMERCE	ERETL	6	0	6
FOOD PROCESSORS	FDPRD	21	46	67
FOOD & DRUG RETAILERS	FDRET	17	13	30
FARMING & FISHING	FMFSH	7	8	15
FURNISHING & FLOOR COVERINGS	FURFL	13	16	29
GAMBLING	GAMNG	11	7	18
GAS DISTRIBUTION	GASDS	2	2	4
GOLD MINING	GOLDS	9	21	30
HOUSEHOLD APPLIANCES & HOUSEWARES	HAPPL	8	20	28
RETAIL – HARDLINES	HARDL	27	38	65
HOSPITAL MANAGEMENT & LONG-TERM CARE	HOSPM	5	6	11
HOTELS	HOTEL	7	15	22
HOUSE BUILDING	HOUSE	20	29	49
HOUSEHOLD PRODUCTS	HSEPR	3	2	5
INTERNET	INTNT	16	13	29
LEISURE FACILITIES	LEISR	44	46	90
LEISURE EQUIPMENT	LSREQ	8	9	17
MEDIA AGENCIES	MEDAG	31	26	57

MEDICAL EQUIPMENT & SUPPLIES	MEDEQ	31	20	51
OTHER MINERAL EXTRACTORS & MINES	MINES	20	16	36
MULTI-UTILITIES	MTUTL	1	2	3
RETAILERS - MULTI-DEPARTMENT	MULTI	17	15	32
NON-FERROUS METALS	NOFMS	1	8	9
OIL & GAS EXPLORATION & PRODUCTION	OILEP	25	28	53
OIL INTEGRATED	OILIN	4	8	12
OIL SERVICES	OILSV	8	8	16
OTHER CONSTRUCTION	OTHCN	25	17	42
OTHER HEALTH CARE	OTHCR	6	4	10
PAPER	PAPER	3	6	9
PHOTOGRAPHY	PHOTO	1	1	2
PHARMACEUTICALS	PHRMC	17	24	41
PERSONAL PRODUCTS	PRNSL	5	3	8
PUBLISHING & PRINTING	PUBLS	59	54	113
RESTAURANTS AND PUBS	RESTS	38	32	70
RAIL, ROAD & FREIGHT	RROAD	24	20	44
SECURITY & ALARMS SERVICES	SECAL	13	5	18
SEMICONDUCTORS	SEMIC	8	2	10
SHIPPING & PORTS	SHPNG	9	14	23
SOFT DRINKS	SOFTD	2	1	3
RETAILERS, SOFT GOODS	SOFTG	25	15	40
SOFTWARE	SOFTW	94	40	134
STEEL	STEEL	2	9	11
SUBSCRIPTION ENTERTAINMENT NETWORKS	SUBEN	3	3	6
TELECOMMUNICATIONS EQUIPMENT	TELEQ	13	5	18
FIXED-LINE TELECOMMUNICATION SERVICES	TELFL	20	19	39
WIRELESS TELECOMMUNICATION SERVICES.	TELWR	7	4	11
TEXTILES & LEATHER GOODS	TEXOT	8	26	34
TOBACCO	TOBAC	3	3	6
TV, RADIO & FILMED ENTERTAINMENT	TVRFE	30	28	58
ENVIRONMENTAL CONTROL	WASTE	4	8	12
WATER	WATER	11	45	56
Total		**1280**	**1313**	**2593**

Appendix 2: Distribution of the Pooled Sample by Means of Industrial Classifications after Deletion of Outliers for each Deflator: Book Value (BV), Number of Shares (NS), Sales (SA) and Opening Market Value (OMV).

Industry Sector (INDM)	INDC	BV		NS		SA		OMV	
		Freq.	%	Freq.	%	Freq.	%	Freq.	%
Aerospace	AEROS	169	1.14	162	1.11	167	1.14	165	1.14
Airlines & Airports	AIRLN	115	0.77	105	0.72	105	0.72	104	0.72
Auto Parts	AUPRT	177	1.19	175	1.2	177	1.21	173	1.19
Automobile	AUTOS	6	0.04	6	0.04	6	0.04	6	0.04
Biotechnology	BIOTC	233	1.57	211	1.45	213	1.45	213	1.47
Building & Const. Material	BMATS	453	3.05	446	3.06	433	2.95	432	2.97
Builders Merchants	BMERC	173	1.16	176	1.21	173	1.18	152	1.05
Beverages - Brewers	BREWS	18	0.12	21	0.14	18	0.12	18	0.12
Business Support Services	BUSUP	993	6.66	957	6.57	963	6.56	938	6.46
Chemicals, Commodity	CHEMS	61	0.41	60	0.41	61	0.42	51	0.35
Chemicals, Adv. Materials	CHMAV	99	0.67	97	0.67	99	0.68	95	0.65
Chemicals, Speciality	CHMSP	159	1.07	161	1.11	159	1.08	170	1.17
Clothing & Footwear	CLTHG	243	1.64	237	1.63	243	1.66	247	1.7
Computer Services	CMPSV	354	2.38	346	2.38	354	2.41	351	2.42
Consumer Electronics	CNELE	151	1.02	142	0.98	151	1.03	149	1.03
Commercial Veh. & Trucks	COMMV	43	0.29	43	0.3	43	0.29	43	0.3
Computer Hardware	COMPH	91	0.61	90	0.62	91	0.62	87	0.6
Defence	DEFEN	57	0.38	54	0.37	57	0.39	55	0.38
Delivery Services	DELSV	63	0.42	62	0.43	63	0.43	60	0.41
Beverages-Distiller &Vintners	DISTV	105	0.71	105	0.72	105	0.72	104	0.72
Diversified Industries	DIVIN	121	0.81	118	0.81	121	0.82	122	0.84
Disc. & Superstores	DSCST	26	0.18	24	0.16	26	0.18	26	0.18
Vehicle Distribution	DSVHL	237	1.6	235	1.61	237	1.62	241	1.66
Education - Business Training	EDUTR	218	1.47	212	1.46	218	1.49	203	1.4
Electricity	ELECT	102	0.69	112	0.77	102	0.7	111	0.76
Electrical Equipment	ELEQP	194	1.31	197	1.35	194	1.32	201	1.38
Electronic Equipment	ELETR	525	3.53	510	3.5	525	3.58	514	3.54
Engineering Contractors	ENGCO	173	1.16	170	1.17	173	1.18	169	1.16
Engineering Fabricators	ENGFA	207	1.39	201	1.38	207	1.41	205	1.41
Engineering General	ENGIN	667	4.49	672	4.62	667	4.55	677	4.66
Retailers - E-commerce	ERETL	28	0.19	27	0.19	28	0.19	26	0.18
Food Processors	FDPRD	437	2.94	418	2.87	417	2.84	401	2.76
Food & Drug Retailers	FDRET	234	1.58	207	1.42	204	1.39	214	1.47
Farming & Fishing	FMFSH	100	0.67	94	0.65	100	0.68	100	0.69
Furnishing & Floor coverings	FURFL	225	1.51	228	1.57	225	1.53	233	1.6
Gambling	GAMNG	104	0.7	103	0.71	104	0.71	96	0.66
Gas Distribution	GASDS	13	0.09	13	0.09	13	0.09	13	0.09
Gold Mining	GOLDS	39	0.26	44	0.3	39	0.27	44	0.3
Household Appliances	HAPPL	171	1.15	168	1.15	171	1.16	164	1.13
Retail - Hardlines	HARDL	364	2.45	361	2.48	364	2.48	367	2.53
Hospital Management	HOSPM	68	0.46	66	0.45	68	0.46	64	0.44
Hotels	HOTEL	141	0.95	137	0.94	141	0.96	139	0.96
House Building	HOUSE	406	2.73	408	2.8	406	2.77	405	2.79
Household Products	HSEPR	60	0.4	60	0.41	60	0.41	61	0.42
Internet	INTNT	122	0.82	115	0.79	118	0.8	115	0.79
Leisure Facilities	LEISR	449	3.02	441	3.03	449	3.06	452	3.11
Leisure Equipment	LSREQ	118	0.79	115	0.79	118	0.8	115	0.79
Media Agencies	MEDAG	268	1.8	278	1.91	268	1.83	288	1.98
Medical Equipment	MEDEQ	306	2.06	305	2.1	306	2.09	303	2.09
Other Mineral Extractors	MINES	118	0.79	124	0.85	118	0.8	125	0.86
Multi-Utilities	MTUTL	16	0.11	17	0.12	16	0.11	16	0.11

Retailers - Multi-Department	MULTI	235	1.58	228	1.57	235	1.6	233	1.6
Non-Ferrous Metals	NOFMS	32	0.22	31	0.21	32	0.22	31	0.21
Oil & Gas Exploration	OILEP	227	1.53	229	1.57	227	1.55	226	1.56
Oil Integrated	OILIN	5	0.03	4	0.03	5	0.03	6	0.04
Oil Services	OILSV	77	0.53	75	0.52	77	0.52	74	0.51
Other Construction	OTHCN	396	2.67	398	2.73	396	2.7	381	2.62
Other Health Care	OTHCR	67	0.45	64	0.44	67	0.46	64	0.44
Paper	PAPER	69	0.46	68	0.47	69	0.47	69	0.48
Pharmaceuticals	PHOTO	21	0.14	21	0.14	21	0.14	21	0.15
Photography	PHRMC	164	1.1	152	1.04	164	1.12	158	1.09
Personal Products	PRNSL	49	0.33	48	0.33	49	0.33	48	0.33
Publishing & Printing	PUBLS	432	2.91	418	2.87	422	2.88	412	2.84
Restaurants & Pubs	RESTS	420	2.83	414	2.84	420	2.86	416	2.86
Rail, Road & Freight	RROAD	274	1.86	277	1.9	274	1.84	276	1.9
Security & Alarm Services	SECAL	126	0.85	111	0.76	116	0.79	111	0.76
Semiconductors	SEMIC	67	0.45	65	0.45	67	0.46	64	0.44
Shipping & Ports	SHPNG	157	1.06	150	1.03	157	1.07	154	1.06
Soft Drinks	SOFTD	32	0.22	31	0.21	32	0.22	31	0.21
Retailers, Soft Goods	SOFTG	337	2.27	323	2.22	337	2.3	319	2.2
Software	SOFTW	523	3.52	516	3.54	513	3.5	520	3.58
Steel	STEEL	71	0.48	68	0.47	71	0.48	70	0.48
Subscription Ent. Networks	SUBEN	15	0.11	13	0.09	15	0.1	13	0.09
Telecom. Equipment	TELEQ	115	0.77	114	0.78	115	0.78	110	0.72
Fixed-Line Telecom. Services	TELFL	82	0.55	86	0.59	82	0.56	78	0.54
Wireless Telecom. Services	TELWR	36	0.24	27	0.19	36	0.25	32	0.22
Textiles & Leather Goods	TEXOT	239	1.61	239	1.64	237	1.62	245	1.69
Tobacco	TOBAC	4	0.05	7	0.05	4	0.03	4	0.03
TV, Radio & Entertainment	TVRFE	319	2.14	316	2.17	319	2.17	305	2.1
Environmental Control	WASTE	74	0.5	69	0.47	72	0.49	72	0.5
Water	WATER	169	1.14	161	1.11	159	1.08	162	1.12
Total		**14854**	**100**	**14559**	**100**	**14674**	**100**	**14528**	**100**

Appendix 3: Frequency Distribution of Capital expenditures Announcements by Industry (1990-2003)

Industry	INDC	Firms	%	Anns.	%
Aerospace	AEROS	5	1.2	12	1.4
Airlines & Airports	AIRLN	4	0.9	10	1.1
Auto Parts	AUPRT	8	1.9	15	1.7
Biotechnology	BIOTC	4	0.9	19	2.1
Building & Construction Materials	BMATS	18	4.2	34	3.8
Builders Merchants	BMERC	5	1.2	6	0.7
Beverages - Brewers	BREWS	1	0.2	4	0.5
Business Support Services	BUSUP	26	6.1	55	6.2
Chemicals, Commodity	CHEMS	3	0.7	4	0.5
Chemicals, Advanced Materials	CHMAV	4	0.9	9	1
Chemicals, Speciality	CHMSP	11	2.6	29	3.3
Clothing & Footwear	CLTHG	3	0.7	3	0.3
Computer Services	CMPSV	8	1.9	13	1.5
Consumer Electronics	CNELE	6	1.4	11	1.2
Commercial Vehicles & Trucks	COMMV	2	0.5	3	0.3
Computer Hardware	COMPH	4	0.9	6	0.8
Defence	DEFEN	1	0.2	2	0.2
Delivery Services	DELSV	1	0.2	1	0.1
Beverages - Distillers &Vintners	DISTV	3	0.7	9	1
Diversified Industries	DIVIN	1	0.2	3	0.3
Discount & Superstores and Warehouses	DSCST	2	0.5	6	0.7
Vehicle Distribution	DSVHL	8	1.9	15	1.7
Education Business Train. & Employment	EDUTR	4	0.9	5	0.6
Electricity	ELECT	4	0.9	9	1
Electrical Equipment	ELEQP	2	0.5	2	0.2
Electronic Equipment	ELETR	8	2	17	1.9
Engineering Contractors	ENGCO	2	0.5	3	0.3
Engineering Fabricators	ENGFA	3	0.7	3	0.3
Engineering General	ENGIN	21	4.9	33	3.7
Food Processors	FDPRD	16	3.8	40	4.5
Food & Drug Retailers	FDRET	8	1.9	26	2.9
Furnishing & Floor coverings	FURFL	5	1.2	7	0.8
Gambling	GAMNG	2	0.5	3	0.3
Household Appliances & Housewares	HAPPL	4	0.9	4	0.5
Retail - Hardlines	HARDL	8	1.9	17	1.9
Hospital Management & Long-Term Care	HOSPM	1	0.2	2	0.2
Hotels	HOTEL	7	1.6	18	2
House Building	HOUSE	10	2.4	12	1.4
Household Products	HSEPR	1	0.2	1	0.1
Internet	INTNT	2	0.5	3	0.3
Leisure Facilities	LEISR	11	2.6	31	3.5
Leisure Equipment	LSREQ	2	0.5	3	0.3
Media Agencies	MEDAG	6	1.4	12	1.4
Medical Equipment & Supplies	MEDEQ	7	1.6	12	1.4
Other Mineral Extractors & Mines	MINES	2	0.5	4	0.5
Multi-Utilities	MTUTL	2	0.5	2	0.2
Retailers - Multi-Department	MULTI	9	2.1	20	2.3
Non-Ferrous Metals	NOFMS	1	0.2	1	0.1

Oil & Gas Exploration & Production	OILEP	9	2.1	17	1.9
Oil Integrated	OILIN	1	0.2	5	0.6
Other Construction	OTHCN	9	2.1	19	2.2
Other Health Care	OTHCR	1	0.2	1	0.1
Paper	PAPER	1	0.2	1	0.1
Pharmaceuticals	PHRMC	7	1.6	23	2.6
Personal Products	PRNSL	1	0.2	1	0.1
Publishing & Printing	PUBLS	21	4.9	39	4.4
Restaurants & Pubs	RESTS	19	4.5	43	5
Rail, Road & Freight	RROAD	10	2.4	22	2.5
Security & Alarm Services	SECAL	1	0.2	2	0.2
Shipping & Ports	SHPNG	5	1.2	15	1.7
Retailers, Soft Goods	SOFTG	11	2.6	20	2.3
Software	SOFTW	19	4.5	32	3.6
Steel	STEEL	2	0.5	5	0.6
Subscription Entertainment Networks	SUBEN	2	0.5	2	0.2
Telecommunications Equipment	TELEQ	5	1.2	8	0.9
Fixed-Line Telecommunication Services	TELFL	4	0.9	16	1.8
Wireless Telecommunication Services	TELWR	2	0.5	8	0.9
Textiles & Leather Goods	TEXOT	2	0.5	2	0.2
TV, Radio & Filmed Entertainment	TVRFE	10	2.4	28	3.3
Environmental Control	WASTE	4	0.9	9	1
Water	WATER	4	0.9	7	0.8
Total		**426**	**100**	**884**	**100**

Appendix 4: Mean Abnormal Returns and Cumulative Abnormal Returns 20 Days before and after Announcement Day

Day	AR	t-stat	AB>0	CAR	t-stat
-20	-0.0162	-0.19	48.4	-0.0162	-0.19
-19	0.1084*	1.72	46.2	0.0932	1.00
-18	0.0251	0.40	44.6	0.1183	1.07
-17	-0.0573	-0.79	46.9	0.0616	0.48
-16	-0.0572	-0.85	45.3	0.0044	0.03
-15	0.0064	0.09	44.4	0.0108	0.07
-14	-0.0285	-0.42	45.1	-0.0183	-0.11
-13	0.0583	0.79	45.5	0.0406	0.23
-12	-0.0546	-0.70	42.7	-0.0140	-0.08
-11	0.0002	0.00	45.5	-0.0132	-0.07
-10	0.0120	0.20	46.0	-0.0012	-0.01
-9	-0.1450**	-2.03	46.9	-0.1462	-0.70
-8	-0.0974	-1.32	42.9	-0.2436	-1.09
-7	0.0004	-0.00	44.8	-0.2432	-1.06
-6	0.0282	0.39	43.7	-0.2150	-0.91
-5	0.0351	0.53	45.1	-0.1811	-0.73
-4	0.0543	0.78	48.2	-0.1272	-0.51
-3	0.0474	0.63	45.8	-0.0802	-0.32
-2	-0.0381	-0.52	46.0	-0.1183	-0.49
-1	0.0466	0.65	52.0	-0.0723	-0.27
0	0.2715***	3.08	57.9	0.1992	0.70
1	0.0619	0.68	49.4	0.2601	0.88
2	-0.0071	-0.06	48.9	0.2530	0.80
3	0.0812	1.16	47.5	0.3342	1.04
4	-0.0093	-0.14	42.9	0.3251	1.00
5	0.1394	1.81	45.1	0.4635	1.42
6	0.0558	0.83	43.7	0.5193	1.56
7	-0.1221**	-1.71	40.1	0.3974	1.17
8	0.0082	0.10	45.8	0.4046	1.15
9	0.0064	0.08	43.2	0.4110	1.14
10	0.0105	0.11	42.4	0.4205	1.14
11	0.0181	0.24	44.6	0.4386	1.14
12	0.0817	1.03	46.5	0.5193	1.32
13	-0.0364	-0.53	46.2	0.4831	1.22
14	-0.0237	-0.41	43.7	0.4584	1.17
15	0.0274	0.41	45.3	0.4868	1.23
16	0.0276	0.42	45.5	0.5144	1.30
17	-0.0668	-0.93	43.9	0.4466	1.11
18	0.1173*	1.61	45.1	0.5649	1.39
19	-0.0142	-0.20	43.9	0.5507	1.35
20	0.0591	0.74	44.6	0.6084	1.49

AR is abnormal returns, CAR is cumulative returns and AR>0 is the percentage of positive abnormal returns, and it is tested for statistical difference from 50% using a non-parametric binomial test. *, **, *** Represent the, 10%, 5% and 1% levels of significance, respectively.

Appendix 5: Distribution of the Final Sample on the Basis of Size (Book Value as Deflator)

Year	Final Sample	Small Firms	Medium Firms	Large Firms
1990	910	303	303	304
1991	921	307	307	307
1992	914	304	304	306
1993	948	316	316	316
1994	970	323	323	324
1995	986	328	328	330
1996	1134	378	378	378
1997	1261	420	420	421
1998	1232	410	410	412
1999	1117	372	372	373
2000	1099	366	366	367
2001	1169	389	389	391
2002	1080	360	360	360
2003	1113	371	371	371
All	**14854**	**4947**	**4947**	**4960**
%	**100**	**33.30**	**33.30**	**33.40**

Appendix 6: Distribution of the Final Sample on the Basis of Size (Number of Shares as Deflator)

Year	Final Sample	Small Firms	Medium Firms	Large Firms
1990	904	301	301	302
1991	910	303	303	304
1992	908	302	302	304
1993	935	311	311	313
1994	967	322	322	323
1995	977	325	325	327
1996	1129	376	376	377
1997	1235	411	411	413
1998	1189	396	396	397
1999	1060	353	353	354
2000	1048	349	349	350
2001	1134	378	378	378
2002	1056	352	352	352
2003	1107	369	369	369
All	**14559**	**4848**	**4848**	**4863**
%	**100**	**33.30**	**33.30**	**33.40**

Appendix 7: Distribution of the Final Sample on the Basis of Size (Sales as Deflator)

Year	Final Sample	Small Firms	Medium Firms	Large Firms
1990	907	302	302	303
1991	918	306	306	306
1992	911	303	303	305
1993	948	316	316	316
1994	968	322	322	324
1995	982	327	327	328
1996	1128	376	376	376
1997	1154	384	384	386
1998	1212	404	404	404
1999	1109	369	369	371
2000	1095	365	365	365
2001	1159	386	386	387
2002	1072	357	357	358
2003	1111	370	370	371
All	**14674**	**4887**	**4887**	**4900**
%	**100**	**33.30**	**33.30**	**33.40**

Appendix 8: Distribution of the Final Sample on the Basis of Size (Opening Market Value as Deflator)

Year	Final Sample	Small Firms	Medium Firms	Large Firms
1990	890	296	296	298
1991	906	302	302	302
1992	904	301	301	302
1993	932	310	310	312
1994	954	318	318	318
1995	980	326	326	328
1996	1082	360	360	362
1997	1222	407	407	408
1998	1209	403	403	403
1999	1098	366	366	366
2000	1052	350	350	352
2001	1123	374	374	375
2002	1064	354	354	356
2003	1112	370	370	372
All	**14528**	**4837**	**4837**	**4854**
%	**100**	**33.30**	**33.30**	**33.40**

Appendix 9: Distribution of the Final Sample on the Basis of Manufacturing and Non-Manufacturing Firms (Book Value as Deflator)

Year	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
1990	910	532	378
1991	921	538	383
1992	914	534	380
1993	948	554	394
1994	970	567	403
1995	986	576	410
1996	1134	663	471
1997	1261	737	524
1998	1232	720	512
1999	1117	653	464
2000	1099	642	457
2001	1169	683	486
2002	1080	631	449
2003	1113	650	463
All	**14854**	**8680**	**6174**
%	**100**	**58.44**	**41.56**

Appendix 10: Distribution of the Final Sample on the Basis of Manufacturing and Non-Manufacturing Firms (Number of Shares as Deflator)

Year	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
1990	904	528	376
1991	910	531	379
1992	908	530	378
1993	935	546	389
1994	967	564	403
1995	977	570	407
1996	1129	659	470
1997	1235	721	514
1998	1189	694	495
1999	1060	619	441
2000	1048	612	436
2001	1134	662	472
2002	1056	616	440
2003	1107	646	461
All	**14559**	**8498**	**6061**
%	**100**	**58.36**	**41.64**

Appendix 11: Distribution of the Final Sample on the Basis of Manufacturing and Non-Manufacturing Firms (Sales as Deflator)

Year	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
1990	907	530	377
1991	918	536	382
1992	911	532	379
1993	948	554	394
1994	968	566	402
1995	982	574	408
1996	1128	659	469
1997	1154	674	480
1998	1212	708	504
1999	1109	648	461
2000	1095	640	455
2001	1159	677	482
2002	1072	626	446
2003	1111	649	462
All	**14674**	**8573**	**6101**
%	**100**	**58.43**	**41.57**

Appendix 12: Distribution of the Final Sample on the Basis of Manufacturing and Non-Manufacturing Firms (Opening Market Value as Deflator)

Year	Final Sample	Manufacturing Firms	Non-Manufacturing Firms
1990	890	519	371
1991	906	528	378
1992	904	527	377
1993	932	544	388
1994	954	556	398
1995	980	572	408
1996	1082	631	451
1997	1222	713	509
1998	1209	705	504
1999	1098	640	458
2000	1052	614	438
2001	1123	655	468
2002	1064	621	443
2003	1112	649	463
All	**14528**	**8474**	**6054**
%	**100**	**58.32**	**41.68**

Appendix 13: Splitting Final Sample on the Basis of Profit and Loss-Making Firms (Book Value as Deflator)

Year	Final Sample	Profit-Making Firms	Loss-Making Firms
1990	910	715	195
1991	921	724	197
1992	914	718	196
1993	948	745	203
1994	970	762	208
1995	986	775	211
1996	1134	891	243
1997	1261	991	270
1998	1232	968	264
1999	1117	878	239
2000	1099	863	236
2001	1169	918	251
2002	1080	849	231
2003	1113	874	239
All	**14854**	**11671**	**3183**
%	**100**	**78.57**	**21.43**

Appendix 14: Splitting Final Sample on the Basis of Profit and Loss-Making Firms (Number of Shares as Deflator)

Year	Final Sample	Profit-Making Firms	Loss-Making Firms
1990	904	708	196
1991	910	713	197
1992	908	712	196
1993	935	733	202
1994	967	758	209
1995	977	766	211
1996	1129	885	244
1997	1235	968	267
1998	1189	932	257
1999	1060	831	229
2000	1048	821	227
2001	1134	889	245
2002	1056	827	229
2003	1107	867	240
All	**14559**	**11410**	**3149**
%	**100**	**78.36**	**21.64**

Appendix 15: Splitting Final Sample on the Basis of Profit and Loss-Making Firms (Sales as Deflator)

Year	Final Sample	Profit-Making Firms	Loss-Making Firms
1990	907	711	196
1991	918	720	198
1992	911	714	197
1993	948	743	205
1994	968	759	209
1995	982	770	212
1996	1128	884	244
1997	1154	905	249
1998	1212	950	262
1999	1109	869	240
2000	1095	858	237
2001	1159	908	251
2002	1072	840	232
2003	1111	871	240
All	**14674**	**11502**	**3172**
%	**100**	**78.38**	**21.62**

Appendix 16: Splitting Final Sample on the Basis of Profit and Loss-Making Firms (Opening Market Value as Deflator)

Year	Final Sample	Profit-Making Firms	Loss-Making Firms
1990	890	699	191
1991	906	712	194
1992	904	710	194
1993	932	732	200
1994	954	749	205
1995	980	770	210
1996	1082	850	232
1997	1222	960	262
1998	1209	950	259
1999	1098	863	235
2000	1052	826	226
2001	1123	882	241
2002	1064	836	228
2003	1112	874	238
All	**14528**	**11413**	**3115**
%	**100**	**78.56**	**21.44**

Appendix 17: Small Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	213.59	455.63	383.01	292.20	470.07	240.67	387.71	85.30	378.22	350.94	693.05	308.39	310.50	-140.86	321.07
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.18)	(0.00)
BV	0.60	0.63	0.67	0.63	0.62	0.69	0.73	0.74	0.66	0.69	1.59	0.64	1.88	1.92	0.68
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.01	0.05	0.05	0.17	-0.02	0.12	0.32	0.21	0.24	0.10	0.58	0.10	0.11	0.09	0.02
(p-value)	(0.64)	(0.01)	(0.09)	(0.17)	(0.04)	(0.03)	(0.00)	(0.00)	(0.01)	(0.03)	(0.00)	(0.01)	(0.38)	(0.02)	(0.00)
D	3.75	2.35	0.71	3.96	3.76	2.78	1.62	1.86	3.52	5.02	3.41	4.58	1.37	2.35	2.83
(p-value)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.65	0.22	0.21	0.19	0.27	0.37	0.19	0.51	0.15	0.16	0.16	0.17	0.29	0.28	0.08
(p-value)	(0.05)	(0.01)	(0.11)	(0.06)	(0.00)	(0.00)	(0.04)	(0.01)	(0.02)	(0.00)	(0.03)	(0.01)	(0.00)	(0.00)	(0.00)
RD	0.02	0.07	0.39	0.29	0.10	1.37	1.11	0.53	0.13	0.48	1.11	1.24	0.99	0.21	0.21
(p-value)	(0.07)	(0.69)	(0.20)	(0.10)	(0.80)	(0.16)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.56)	(0.00)
CC	0.25	-0.03	-0.15	-0.12	0.03	-0.15	-0.10	-0.09	-0.10	-0.14	-0.36	-0.71	-0.11	-0.25	-0.48
(p-value)	(0.06)	(0.50)	(0.00)	(0.04)	(0.56)	(0.08)	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)
OI	0.01	0.05	0.02	0.04	0.02	0.06	0.03	0.03	0.02	0.04	0.07	0.03	0.06	0.01	0.32
(p-value)	(0.04)	(0.00)	(0.11)	(0.00)	(0.11)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.33)	(0.00)
R^2	0.18	0.15	0.08	0.14	0.14	0.10	0.13	0.11	0.15	0.16	0.20	0.23	0.11	0.10	0.11
Cases	303	307	304	316	323	328	378	420	410	372	366	389	360	371	4947

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 18: Medium Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	206.81	172.55	-49.73	161.32	181.54	384.28	202.38	98.17	148.98	362.55	680.68	694.22	298.86	-118.72	1178.59
(p-value)	(0.00)	(0.03)	(0.51)	(0.06)	(0.14)	(0.00)	(0.06)	(0.55)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.25)	(0.00)
BV	1.47	1.48	1.57	1.55	1.59	1.45	1.58	1.73	1.68	1.66	1.58	1.74	1.85	1.92	1.72
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.05	0.55	-0.05	-0.02	0.07	0.39	-0.35	0.13	0.21	0.10	0.58	0.08	0.30	0.05	0.49
(p-value)	(0.07)	(0.04)	(0.10)	(0.55)	(0.23)	(0.00)	(0.03)	(0.04)	(0.00)	(0.04)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
D	2.58	1.25	0.82	2.54	1.05	2.80	3.49	1.50	1.51	2.43	3.35	2.99	1.17	2.58	10.49
(p-value)	(0.00)	(0.03)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.24	0.24	0.28	0.10	0.19	0.28	0.29	0.13	0.11	0.34	0.14	0.30	0.43	0.32	0.78
(p-value)	(0.03)	(0.07)	(0.00)	(0.28)	(0.04)	(0.00)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)
RD	0.75	0.78	0.19	0.07	0.21	0.76	1.63	0.21	0.45	0.92	1.09	0.72	0.81	0.46	3.92
(p-value)	(0.06)	(0.00)	(0.01)	(0.71)	(0.06)	(0.24)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.20	-0.18	0.01	-0.08	-0.04	-0.27	-0.28	-0.21	-0.13	-0.23	-0.37	-0.14	-0.14	-0.22	-1.10
(p-value)	(0.00)	(0.00)	(0.84)	(0.17)	(0.04)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.03	0.01	0.01	0.03	0.01	0.07	0.08	0.05	0.03	0.03	0.07	0.06	0.05	0.05	0.12
(p-value)	(0.00)	(0.48)	(0.33)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
R^2	0.09	0.10	0.08	0.08	0.05	0.14	0.11	0.08	0.07	0.11	0.20	0.12	0.13	0.12	0.40
Cases	303	307	304	316	323	328	378	420	410	372	366	389	360	371	4947

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 19: Large Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	5390.10	3813.60	2284.60	688.700	2529.30	3271.80	3186.20	2473.70	3528.00	1903.20	4969.00	2717.40	423.90	793.43	2215.48
(p-value)	(0.00)	(0.00)	(0.01)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.69)	(0.34)	(0.00)
BV	2.74	2.84	3.69	2.82	2.40	2.80	2.98	2.70	3.63	3.74	3.61	2.06	4.37	3.88	3.65
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.48	-0.05	-0.20	0.55	1.69	0.86	1.70	1.06	1.03	0.80	1.57	2.71	2.13	1.41	0.42
(p-value)	(0.03)	(0.92)	(0.04)	(0.04)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	7.16	7.89	5.82	13.76	15.16	9.14	10.36	18.55	8.75	13.80	5.18	17.41	9.64	10.26	10.39
(p-value)	(0.01)	(0.01)	(0.05)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.07	1.41	1.56	0.82	0.28	0.62	4.23	1.52	0.73	0.81	2.31	4.58	1.05	1.63	0.70
(p-value)	(0.08)	(0.03)	(0.07)	(0.32)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	4.80	5.53	3.75	4.42	3.27	3.86	4.45	4.90	6.88	3.31	4.76	3.09	3.32	5.16	4.47
(p-value)	(0.03)	(0.07)	(0.07)	(0.06)	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-1.54	0.28	-1.05	-1.85	-1.44	-1.10	-1.01	-1.41	-0.94	-1.76	-1.35	-1.19	-1.38	-1.52	-1.07
(p-value)	(0.00)	(0.51)	(0.04)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.31	0.30	0.34	0.31	0.70	0.46	0.32	0.48	0.33	0.37	0.46	0.51	0.38	0.43	0.38
(p-value)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.49	0.41	0.27	0.32	0.40	0.33	0.38	0.37	0.31	0.37	0.31	0.42	0.43	0.36	0.33
Cases	304	307	306	316	324	330	378	421	412	373	367	391	360	371	4960

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 20: Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	4564.1	3926.6	2329.1	1751.5	985.07	3125.4	4010.7	3041.3	4481.1	3849.1	3565.5	3867.7	3235.9	1412.6	3896.2
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)
BV	0.96	0.65	1.23	0.81	0.83	0.78	0.59	0.76	1.21	0.59	1.46	1.07	1.87	1.10	0.68
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.60	0.21	0.41	0.85	0.60	0.28	2.55	0.57	1.56	0.70	0.43	1.01	1.44	1.56	0.53
(p-value)	(0.01)	(0.05)	(0.03)	(0.01)	(0.02)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	9.51	15.99	8.08	18.15	22.01	19.15	10.51	16.71	10.45	24.79	10.72	15.33	13.51	15.54	19.53
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.81	2.08	2.67	1.47	2.20	0.76	4.03	3.70	0.93	1.70	0.74	1.62	1.01	2.00	1.19
(p-value)	(0.01)	(0.00)	(0.03)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	7.00	5.02	6.25	6.52	7.73	6.55	11.60	10.86	9,44	6.69	8.42	5.38	5.27	7.07	9.08
(p-value)	(0.01)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-2.29	-0.64	-1.34	-1.99	-0.99	-1.21	-2.03	-2.56	-1.41	-2.24	-0.68	-1.01	-1.37	-1.93	-1.34
(p-value)	(0.00)	(0.05)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.33	0.39	0.37	0.30	0.54	0.52	0.37	0.57	0.50	0.39	0.61	0.34	0.42	0.46	0.49
(p-value)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.52	0.42	0.37	0.37	0.48	0.61	0.48	0.35	0.51	0.53	0.57	0.43	0.53	0.54	0.53
Cases	532	538	534	554	567	576	663	737	720	653	642	683	631	650	8680

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 21: Non-Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	4350.7	3940.2	4122.4	713.98	4880.66	4488.4	4439.5	3526.4	4138.1	1351.1	6685.4	3460.3	925.05	1421.1	3606.4
(p-value)	(0.00)	(0.00)	(0.00)	(0.11)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)	(0.00)	(0.16)	(0.31)	(0.00)
BV	1.40	0.79	1.03	1.32	1.14	0.92	0.58	0.78	1.08	1.80	0.39	1.09	1.60	1.81	1.37
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.01	0.54	0.56	0.14	2.30	-0.74	0.78	0.69	0.97	0.42	0.12	1.89	1.19	0.18	048
(p-value)	(0.98)	(0.05)	(0.06)	(0.73)	(0.07)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.98)	(0.00)	(0.00)	(0.63)	(0.00)
D	7.55	13.32	9.14	14.67	10.65	14.49	22.77	18.60	15.96	11.41	28.66	17.38	10.66	15.59	15.46
(p-value)	(0.00)	(0.00)	(0.04)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.38	1.36	1.17	1.09	0.57	1.91	2.52	2.64	0.69	1.03	1.66	2.02	2.15	1.40	0.95
(p-value)	(0.01)	(0.00)	(0.07)	(0.04)	(0.03)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	5.91	6.34	8.43	4.21	4.93	3.90	5.17	7.82	7.87	3.78	8.61	4.42	3.57	7.12	5.75
(p-value)	(0.05)	(0.02)	(0.00)	(0.11)	(0.04)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.26	-0.96	-1.13	-1.21	-0.76	-1.34	-1.15	-1.27	-1.39	-1.15	-1.66	-2.55	-1.99	-1.11	-1.06
(p-value)	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.32	0.20	0.33	0.39	0.50	0.57	0.36	0.52	0.30	0.36	0.57	0.75	0.47	0.49	0.43
(p-value)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.45	0.57	0.38	0.53	0.39	0.28	0.56	0.60	0.38	0.46	0.45	0.58	0.45	0.42	0.41
Cases	378	383	380	394	403	410	471	524	512	464	457	486	449	463	6174

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 22: Loss-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	3760.1	1604.9	2564.4	749.24	861.29	2722.2	2530.5	744.68	3029.9	2843.6	6517.9	3227.3	3597.5	1724.0	2281.5
(p-value)	(0.00)	(0.03)	(0.00)	(0.05)	(0.17)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)
BV	0.54	0.96	1.20	1.67	1.29	0.66	0.92	1.77	1.09	1.29	1.18	1.49	0.67	0.35	1.43
(p-value)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.39)	(0.00)
E	-0.28	-0.44	0.25	0.47	-0.53	-2.30	-0.35	-0.45	-0.56	0.27	1.48	1.05	0.20	-1.00	-0.17
(p-value)	(0.38)	(0.33)	(0.05)	(0.06)	(0.04)	(0.06)	(0.02)	(0.01)	(0.13)	(0.02)	(0.00)	(0.00)	(0.67)	(0.01)	(0.00)
D	7.93	10.22	4.67	7.76	8.20	4.80	6.67	7.38	13.98	23.13	13.41	6.73	18.27	24.76	7.09
(p-value)	(0.08)	(0.01)	(0.00)	(0.00)	(0.07)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	1.15	1.46	2.78	0.41	1.78	1.11	4.22	1.16	1.32	1.51	1.00	3.00	2.76	1.45	0.85
(p-value)	(0.07)	(0.06)	(0.10)	(0.02)	(0.03)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	6.33	4.09	7.55	6.42	4.89	7.74	3.74	4.30	7.06	2.91	7.05	4.39	6.63	10.61	3.92
(p-value)	(0.02)	(0.06)	(0.00)	(0.06)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-1.64	-0.48	-1.11	-1.68	-0.59	-0.83	-1.28	-1.03	-1.70	-2.44	-1.03	-2.31	-1.29	-0.78	-1.00
(p-value)	(0.00)	(0.10)	(0.00)	(0.00)	(0.13)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.26	0.13	0.29	0.26	0.31	0.64	0.49	0.30	0.40	0.28	0.52	0.37	0.31	0.29	0.30
(p-value)	(0.00)	(0.11)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.56	0.23	0.33	0.29	0.23	0.28	0.53	0.34	0.43	0.49	0.37	0.36	0.50	0.53	0.35
Cases	195	197	196	203	208	211	243	270	264	239	236	251	231	239	3183

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 23: Profit-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Book Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	3793.7	4404.0	3320.2	1871.6	4684.9	5160.2	2634.0	3198.5	3455.0	1025.1	4184.3	4663.4	-151.37	752.07	2304.7
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.20)	(0.00)	(0.00)	(0.81)	(0.37	(0.00)
BV	0.75	0.49	1.18	0.76	0.44	0.42	0.45	0.33	0.57	0.67	0.24	1.33	0.69	0.99	0.84
(p-value)	(0.00)	(0.04)	(0.00)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.25)	(0.00)	(0.00)	(0.00)	(0.00)
E	5.73	4.40	1.62	2.93	6.77	1.32	7.54	4.37	7.15	8.65	5.19	7.04	7.81	6.77	6.41
(p-value)	(0.00)	(0.06)	(0.10)	(0.04)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	4.68	7.60	8.71	15.69	6.42	19.16	15.61	18.59	8.28	7.18	16.27	12.00	8.90	6.05	8.06
(p-value)	(0.01)	(0.04)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.52	1.60	0.94	0.49	2.50	1.06	0.61	1.25	0.46	0.53	1.43	2.54	1.09	1.74	0.30
(p-value)	(0.04)	(0.00)	(0.01)	(0.04)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	3.91	3.50	2.79	2.98	4.68	8.44	5.17	3.64	4.65	2.03	8.23	2.69	1.32	1.99	2.64
(p-value)	(0.32)	(0.19)	(0.06)	(0.07)	(0.08)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.54)	(0.00)	(0.00)
CC	-1.25	-0.58	-1.18	-1.32	-2.18	-1.12	-2.68	-2.50	-1.79	-1.29	-2.01	-0.94	-1.26	-1.27	-1.21
(p-value)	(0.00)	(0.14)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.49	0.31	0.55	0.40	0.64	0.60	0.39	0.56	0.44	0.46	0.49	0.78	0.51	0.54	0.47
(p-value)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.55	0.59	0.47	0.58	0.37	0.64	0.66	0.54	0.47	0.60	0.48	0.63	0.58	0.54	0.52
Cases	715	724	718	745	762	775	891	991	968	878	863	918	849	874	11671

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 24: Small Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	969.90	1164.44	2462.16	2061.84	3911.49	638.84	1396.37	4379.01	1149.12	2691.93	2749.45	473.65	1247.75	726.62	489.31
(p-value)	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)
BV	0.10	0.31	0.17	0.20	0.22	0.38	0.28	0.30	0.40	0.60	0.21	0.36	0.37	0.59	0.89
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
E	0.03	0.06	0.10	0.09	0.03	0.01	0.32	0.08	0.25	0.16	0.38	0.25	0.27	0.24	0.71
(p-value)	(0.00)	(0.09)	(0.00)	(0.00)	(0.67)	(0.89)	(0.00)	(0.05)	(0.09)	(0.01)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
D	1.71	1.63	1.37	2.79	3.20	1.07	1.08	3.65	2.05	2.57	3.32	0.86	1.44	2.07	3.19
(p-value)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.17	0.16	0.27	0.32	0.28	0.14	0.32	0.32	0.30	0.08	0.49	0.34	0.28	0.35	0.55
(p-value)	(0.02)	(0.05)	(0.00)	(0.00)	(0.02)	(0.11)	(0.00)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	0.18	0.71	0.31	0.76	0.55	0.56	0.62	0.48	0.74	1.69	0.79	0.17	0.16	0.58	0.86
(p-value)	(0.03)	(0.04)	(0.00)	(0.00)	(0.02)	(0.00)	(0.06)	(0.04)	(0.03)	(0.00)	(0.02)	(0.55)	(0.04	(0.00)	(0.00)
CC	-0.07	-0.28	-0.10	-0.08	-0.05	-0.15	-0.21	-0.17	-0.57	-0.26	-0.31	-0.19	-0.10	-0.55	-1.15
(p-value)	(0.03)	(0.17)	(0.14)	(0.02)	(0.06)	(0.04)	(0.00)	(0.08)	(0.02)	(0.01)	(0.07)	(0.02)	(0.01)	(0.00)	(0.00)
OI	0.05	0.02	0.15	0.01	0.01	0.03	0.04	0.01	0.06	0.02	0.06	0.03	0.04	0.06	0.60
(p-value)	(0.00)	(0.05)	(0.00)	(0.44)	(0.05)	(0.00)	(0.00)	(0.15)	(0.00)	(0.15)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
R^2	0.25	0.11	0.27	0.24	0.34	0.10	0.14	0.32	0.14	0.22	0.36	0.10	0.14	0.11	0.33
Cases	301	303	302	311	322	325	376	411	396	353	349	378	352	369	4848

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 25: Medium Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1205.1	2275.64	-145.89	53.14	6063.11	3353.35	5138.77	860.66	3546.69	786.57	606.53	3514.26	1099.01	780.03	1245.90
(p-value)	(0.03)	(0.00)	(0.55)	(0.92)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.15)	(0.11)	(0.00)	(0.33)	(0.00)	(0.00)
BV	0.13	0.11	0.48	0.67	0.94	0.29	0.24	0.01	0.11	0.69	0.02	0.19	0.22	0.38	0.59
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.61)	(0.29)	(0.00)	(0.42)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.05	0.09	0.10	0.32	0.91	0.14	0.25	0.05	1.94	0.36	0.13	0.44	1.37	0.35	0.41
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.07)	(0.00)	(0.00)	(0.00)	(0.00)
D	3.16	3.90	1.13	2.17	11.64	2.55	1.42	1.38	6.30	0.80	0.84	2.36	5.45	1.80	1.86
(p-value)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.15	0.55	0.15	0.17	0.30	0.21	0.12	0.07	1.00	0.35	0.15	0.58	0.91	0.34	0.72
(p-value)	(0.03)	(0.00)	(0.03)	(0.08)	(0.00)	(0.06)	(0.02)	(0.05)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
RD	0.45	0.47	0.66	1.25	2.86	1.12	1.04	0.85	2.28	0.53	0.13	1.31	1.62	0.72	0.83
(p-value)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.72)	(0.00)	(0.05)	(0.00)	(0.00)
CC	-0.07	-0.02	-0.12	-1.30	-0.78	-1.15	-0.76	-0.12	-1.34	-1.30	-0.06	-0.26	-1.55	-0.47	-0.52
(p-value)	(0.03)	(0.04)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.40)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.02	0.00	0.01	0.05	0.38	0.15	0.02	0.00	0.30	0.04	0.02	0.09	0.37	0.12	0.51
(p-value)	(0.00)	(0.29)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.96)	(0.01)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.19	0.25	0.13	0.11	0.74	0.29	0.43	0.08	0.43	0.09	0.08	0.37	0.49	0.16	0.24
Cases	301	303	302	311	322	325	376	411	396	353	349	378	352	369	4848

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 26: Large Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	6374.59	11331.6	2946.16	4578.98	6724.61	2852. 9	4764.22	4250.04	3738.28	365.71	2116.19	1363.31	3024.27	819.06	5076.29
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)
BV	0.53	0.53	0.60	1.30	0.95	1.51	1.38	1.47	1.71	0.67	0.83	0.81	0.97	0.35	0.40
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.78	1.05	0.79	0.67	0.28	0.27	0.93	0.66	1.69	0.72	-0.15	1.90	0.29	0.80	1.57
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.87)	(0.00)	(0.01)	(0.00)	(0.00)
D	11.55	9.50	14.53	4.12	9.88	11.59	6.55	9.57	10.68	8.08	10.90	3.72	5.22	5.80	8.42
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.46	0.68	1.08	0.53	1.27	0.42	0.53	0.79	0.49	0.56	1.23	1.50	0.50	0.33	0.54
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	0.78	0.53	2.27	3.80	3.76	3.11	2.29	5.16	2.31	5.32	2.55	2.60	2.02	2.38	4.74
(p-value)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.78	-0.79	-1.18	-0.96	-0.62	-0.96	-1.34	-0.65	-1.98	-0.65	-1.43	-0.41	-0.40	-0.69	-1.46
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.04)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
OI	0.21	0.07	0.37	0.21	0.28	0.30	0.41	0.53	0.28	0.38	0.18	0.24	0.10	0.22	0.50
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.42	0.61	0.74	0.25	0.74	0.58	0.58	0.61	0.46	0.29	0.31	0.49	0.25	0.41	0.33
Cases	302	304	304	313	323	327	377	413	397	354	350	378	352	369	4863

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 27: Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	6120.49	10378.73	3113.57	12164.53	9429.07	9044.51	7603.28	5463.32	5266.43	386.32	3814.72	3921.24	9182.70	2220.68	1179.70
(p-value)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.40	0.32	0.26	0.30	0.34	0.52	0.50	0.74	0.86	0.40	0.24	0.16	0.78	0.34	0.22
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.20)	(0.00)	(0.00)	(0.00)
E	0.21	0.94	0.60	0.72	0.63	0.17	1.49	1.17	1.54	1.19	0.58	1.40	0.97	1.64	0.89
(p-value)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.02)	(0.00)	(0.00)	(0.00)
D	9.85	3.68	16.37	10.92	8.37	6.42	10.42	8.24	7.15	10.01	4.20	5.83	10.75	8.25	8.03
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.74	1.10	0.43	0.47	1.09	1.17	0.59	0.57	0.48	0.56	1.77	0.46	0.48	1.66	0.86
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.41)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
RD	2.18	2.00	2.44	3.16	3.37	2.36	4.77	4.34	4.85	3.38	10.42	5.61	2.99	5.98	7.96
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.34	-0.26	-0.89	-0.76	-0.56	-0.39	-1.73	-0.24	-1.24	-0.90	-1.25	-0.86	-1.66	-1.07	-1.06
(p-value)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.67)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
OI	0.04	0.65	0.10	0.22	0.11	0.17	0.36	0.30	0.30	0.33	0.31	0.27	0.41	0.59	0.44
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.63	0.67	0.68	0.50	0.58	0.54	0.68	0.57	0.55	0.42	0.48	0.58	0.69	0.55	0.58
Cases	528	531	530	546	564	570	659	721	694	619	612	662	616	646	8498

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 28: Non-Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	2361.29	12969.78	4180.27	12514.72	1373.27	2779.02	5928.30	4928.47	4104.65	1631.47	4076.62	2771.83	1925.86	205.87	424.70
(p-value)	(0.00)	(0.01)	(0.00)	(0.00)	(0.73)	(0.00)	(0.00)	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.22)	(0.06)	(0.00)
BV	0.21	0.45	0.36	0.24	0.49	0.66	0.70	0.57	0.88	0.76	0.25	0.20	0.45	0.51	0.37
(p-value)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)
E	0.19	0.27	1.27	0.97	1.36	0.65	1.07	0.89	1.87	1.35	0.99	0.36	0.77	0.35	1.16
(p-value)	(0.03)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	11.29	13.96	12.64	9.14	12.93	15.48	5.45	15.71	4.33	4.68	8.35	3.50	3.33	11.06	9.71
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.94	0.47	1.92	0.81	1.39	0.85	0.59	1.26	0.79	1.46	0.56	1.23	0.80	1.64	0.74
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	2.91	1.08	2.06	2.83	1.24	0.95	2.28	3.07	3.63	3.44	6.01	2.79	2.27	3.60	7.20
(p-value)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.81	-1.23	-0.60	-0.77	-0.66	-1.16	-0.38	-0.82	-0.94	-0.59	-0.45	-0.63	-0.93	-0.88	-1.31
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.02	0.03	0.29	0.24	0.14	0.24	0.26	0.38	0.21	0.31	0.24	0.30	0.31	0.62	0.49
(p-value)	(0.65)	(0.17)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.57	0.67	0.74	0.39	0.83	0.72	0.60	0.70	0.52	0.58	0.60	0.69	0.52	0.57	0.53
Cases	376	379	378	389	403	307	470	514	495	441	436	472	440	461	6061

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 29: Loss-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	7889.7	3627.51	953.93	9802.67	5215.35	5164.99	9146.82	3628.07	9045.02	2100.68	7075.97	9776.71	8956.02	75.24	1513.09
(p-value)	(0.04)	(0.00)	(0.00)	(0.00)	(0.20)	(0.04)	(0.00)	(0.00)	(0.00)	(0.22)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)
BV	0.38	0.18	0.30	0.25	0.32	0.45	0.28	0.57	0.83	0.75	0.39	0.72	0.61	0.76	0.52
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.14	0.16	0.20	0.12	0.78	0.09	1.81	-0.39	0.46	0.10	0.35	0.66	0.87	-0.48	-0.29
(p-value)	(0.15)	(0.00)	(0.01)	(0.00)	(0.00)	(0.08)	(0.00)	(0.30)	(0.29)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	3.48	6.07	6.04	7.60	4.85	10.15	5.06	12.32	7.05	7.97	6.14	3.67	5.87	9.97	6.75
(p-value)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
CEXP	0.54	0.71	0.36	1.14	1.36	1.11	2.33	0.68	0.29	2.15	0.96	0.59	2.33	1.04	0.87
(p-value)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.33)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
RD	1.35	1.48	1.31	2.58	3.01	1.31	3.39	2.23	3.92	5.49	2.33	1.23	5.25	4.38	5.73
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.11)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)	(0.00)
CC	-0.54	-0.36	-0.28	-0.48	-0.55	-0.52	-0.83	-0.86	-0.55	-0.71	-0.55	-0.91	-0.33	-1.54	-1.38
(p-value)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.03)	(0.04)	(0.00)	(0.00)	(0.00)	(0.03	(0.00)	(0.00)
OI	0.00	0.22	0.04	0.17	0.14	0.29	0.16	0.20	0.51	0.22	0.12	0.18	0.37	0.68	0.37
(p-value)	(0.81)	(0.04)	(0.06)	(0.00)	(0.00)	(0.00)	(0.02)	(0.05)	(0.04)	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.43	0.38	0.53	0.53	0.60	0.39	0.62	0.55	056	0.30	0.52	0.76	0.61	0.51	0.43
Cases	196	197	196	202	209	211	244	267	257	229	227	245	229	240	3149

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 30: Profit-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Number of Shares as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	5506.15	1142.61	4320.53	4815.70	4728.01	3897.95	5826.69	5588.91	4128.37	446.90	3908.30	2459.18	9182.79	695.36	4868.47
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.000	(0.01)	(0.00)
BV	0.39	0.28	0.25	0.41	0.40	0.67	0.57	0.63	0.80	0.90	0.26	1.03	1.09	0.91	0.20
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	5.12	1.88	3.90	1.89	2.78	0.97	1.98	2.56	3.20	5.60	2.42	4.32	1.16	3.23	4.66
(p-value)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.30)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	8.88	12.12	12.70	9.59	11.49	11.48	9.12	8.40	3.77	11.61	12.52	3.07	8.08	5.99	6.07
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)
CEXP	0.79	0.85	0.93	0.79	1.00	0.53	0.50	0.36	0.63	0.82	0.92	1.31	0.56	1.54	0.41
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.38)	(0.02)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)
RD	0.91	1.18	0.62	1.40	2.03	2.53	2.63	3.94	2.31	1.32	1.68	2.94	0.77	3.01	3.21
(p-value)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.11)	(0.02)	(0.01)	(0.01)	(0.75)	(0.00)	(0.00)
CC	-1.06	-0.54	-1.15	-0.96	-0.74	-0.86	-1.68	-0.34	-1.34	-1.20	-0.41	-0.57	-1.70	-0.45	-1.08
(p-value)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.47)	(0.00)	(0.03)	(0.02)	(0.01)	(0.00)	(0.12)	(0.00)
OI	0.16	0.21	0.19	0.12	0.14	0.22	0.35	0.34	0.20	0.34	0.20	0.26	0.34	0.54	0.33
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	0.49	0.66	0.73	0.53	0.79	0.61	0.66	0.62	0.55	0.51	0.45	0.64	0.69	0.66	0.60
Cases	708	713	712	733	758	766	885	968	932	831	821	889	827	867	11410

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 31: Small Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	41.72	272.06	147.12	117.85	686.51	82.66	184.50	515.86	304.62	749.63	214.62	764.68	340.92	808.95	357.81
(p-value)	(0.00)	(0.00)	(0.29)	(0.00)	(0.00)	(0.35)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.18	0.55	0.10	0.17	0.16	0.18	0.19	0.21	0.13	0.07	0.21	0.21	0.10	0.12	0.07
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.43	0.18	0.14	0.07	0.08	0.16	0.27	0.14	0.08	0.05	0.04	0.07	0.09	-0.01	0.03
(p-value)	(0.03)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.42)	(0.00)	(0.05)	(0.44)	(0.00)
D	4.02	5.65	6.02	5.76	6.07	4.81	3.05	2.00	2.72	3.69	4.69	3.37	1.87	1.28	2.30
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.19	0.17	0.16	0.30	0.26	0.20	0.31	0.20	0.16	0.30	0.63	0.21	0.12	0.07	0.17
(p-value)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)
RD	1.04	0.84	1.56	0.77	1.21	1.40	0.73	1.40	1.23	1.78	0.76	1.30	0.80	0.98	0.30
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	().00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.17	-0.90	-0.13	-0.27	-0.17	-0.46	-0.44	-0.69	-0.05	-0.14	-0.56	-0.33	-0.07	-0.35	-0.07
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.44)	(0.07)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
OI	0.04	0.07	0.01	0.06	0.17	0.28	0.00	0.04	0.02	0.06	0.08	0.00	0.06	0.00	0.02
(p-value)	(0.00)	(0.04)	(0.06)	(0.02)	(0.00)	(0.00)	(0.44)	(0.03)	(0.02)	(0.00)	(0.00)	(0.10)	(0.00)	(0.07)	(0.00)
R^2	0.22	0.25	0.29	0.25	0.24	0.23	0.24	0.20	0.16	0.11	0.18	0.18	0.14	0.10	0.15
Cases	302	306	303	316	322	327	376	384	404	369	365	386	357	370	4887

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 32: Medium Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	97.54	101.87	132.86	676.89	224.16	-218.95	112.71	773.49	535.65	663.80	373.50	968.55	283.06	114.23	128.27
(p-value)	(0.07)	(0.00)	(0.03)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.10	0.45	0.10	0.59	0.63	0.64	0.61	0.24	0.09	0.73	0.78	0.80	0.81	0.07	0.07
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.07	0.13	0.21	0.40	0.07	0.31	0.67	0.33	0.14	0.08	0.52	0.55	0.05	0.03	0.03
(p-value)	(0.60)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.40)	(0.00)	(0.00)	(0.00)	(0.14)	(0.31)	(0.02)
D	2.21	1.23	3.35	2.49	1.79	2.71	1.08	1.12	2.47	3.24	2.59	3.58	1.80	1.58	1.23
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.11	0.14	0.16	0.82	0.15	0.40	0.60	0.92	0.30	0.11	0.19	0.07	0.12	0.05	0.08
(p-value)	(0.03)	(0.04)	(0.04)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)	(0.18)	(0.00)	(0.09)	(0.00)	(0.03)	(0.00)
RD	0.38	0.99	0.59	1.64	0.99	1.08	0.99	0.51	1.89	1.63	0.88	0.86	0.52	0.70	0.63
(p-value)	(0.04)	(0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.12	-0.88	-0.15	-0.85	-0.36	-0.17	-0.26	-0.19	-0.15	-0.28	-0.10	-0.02	-0.13	-0.10	-0.05
(p-value)	(0.05)	(0.00)	(0.04)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)
OI	0.01	0.00	0.06	0.04	0.02	0.03	0.01	0.02	0.26	0.04	0.03	0.07	0.16	0.00	0.00
(p-value)	(0.04)	(0.60)	(0.00)	(0.02)	(0.07)	(0.03)	(0.03)	(0.05)	(0.00)	(0.20)	(0.35)	(0.00)	(0.00)	(0.08)	(0.03)
R^2	0.11	0.06	0.05	0.06	0.06	0.08	0.14	0.07	0.15	0.12	0.09	0.11	0.08	0.09	0.07
Cases	302	306	303	316	322	327	376	384	404	369	365	386	357	370	4887

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 33: Large Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	3348.54	1948.45	1084.37	1185.54	2868.42	3831.06	1652.17	940.48	442. 56	1710.26	1528. 78	1794.93	1227.19	1927.29	1262.61
(p-value)	(0.00)	(0.00)	(0.14)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.46)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.40	1.22	1.12	1.05	1.24	1.73	0.65	0.96	0.86	0.77	0.61	0.50	0.43	0.63	0.86
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	1.31	0.50	1.25	0.67	0.82	1.17	1.35	0.68	1.08	0.38	1.51	0.59	0.58	0.48	-0.62
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	11.34	13.72	5.17	8.47	4.09	13.98	7.59	5.38	12.91	19.20	18.77	12.86	6.73	11.19	17.73
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.70	1.40	1.44	1.00	0.56	1.39	1.67	0.55	1.10	1.72	1.30	1.08	0.71	0.31	0.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)
RD	9.21	4.11	5.47	7.74	3.01	3.32	3.32	4.88	2.01	4.14	9.81	6.36	5.17	2.88	4.48
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.47	-1.01	-1.29	-0.55	-1.63	-0.40	-0.51	-0.67	-0.86	-0.44	-0.85	-0.84	-0.50	-0.62	-0.92
(p-value)	(0.00)	(0.00	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.04	0.07	0.07	0.06	0.05	0.00	0.08	0.11	0.17	0.03	0.07	0.03	0.06	0.04	0.04
(p-value)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.14)	(0.00)
R^2	0.56	0.64	0.34	0.45	0.28	0.38	0.45	0.47	0.30	0.50	0.35	0.37	0.36	0.34	0.30
Cases	303	306	305	316	324	328	376	386	404	371	365	387	358	371	4900

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 34: Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const (p-value)	1687.67 (0.00)	4183.91 (0.00)	1621.99 (0.00)	-294.25 (0.39)	2109.20 (0.00)	1616.88 (0.00)	1528.07 (0.00)	1508.98 (0.00)	2547.90 (0.00)	5273.01 (0.00)	4377.8 (0.00)	1988.45 (0.00)	743.28 (0.27)	2226.67 (0.00)	2772.8 (0.00)
BV (p-value)	0.62 (0.00)	1.57 (0.00)	0.35 (0.00)	0.87 (0.00)	0.35 (0.00)	0.53 (0.00)	0.69 (0.00)	0.85 (0.00)	1.00 (0.00)	0.88 (0.00)	0.82 (0.00)	0.88 (0.00)	0.67 (0.00)	0.77 (0.00)	0.90 (0.00)
E (p-value)	0.02 (0.09)	1.48 (0.00)	1.36 (0.00)	1.31 (0.00)	1.100 (0.00)	2.31 (0.00)	0.90 (0.00)	0.51 (0.00)	0.52 (0.00)	0.89 (0.00)	1.26 (0.00)	0.68 (0.00)	0.42 (0.00)	0.23 (0.00)	-0.62 (0.00)
D (p-value)	15.30 (0.00)	6.85 (0.00)	15.70 (0.00)	15.88 (0.00)	12.17 (0.00)	10.91 (0.00)	9.09 (0.00)	10.64 (0.00)	10.69 (0.00)	12.08 (0.00)	21.03 (0.00)	15.59 (0.00)	12.29 (0.00)	13.88 (0.00)	12.93 (0.00)
CEXP (p-value)	1.53 (0.00)	2.00 (0.00)	1.28 (0.00)	0.60 (0.00)	0.50 (0.00)	2.68 (0.00)	1.64 (0.00)	0.92 (0.00)	1.96 (0.00)	1.25 (0.00)	1.33 (0.00)	1.14 (0.00)	0.75 (0.00)	0.78 (0.00)	1.50 (0.00)
RD (p-value)	4.55 (0.00)	4.62 (0.00)	12.43 (0.00)	5.93 (0.00)	5.55 (0.00)	8.91 (0.00)	6.99 (0.00)	5.31 (0.00)	6.32 (0.00)	7.67 (0.00)	5.48 (0.00)	5.59 (0.00)	6.68 (0.00)	3.99 (0.00)	7.54 (0.00)
CC (p-value)	-0.70 (0.00)	-1.40 (0.00)	-1.14 (0.00)	-1.06 (0.00)	-1.59 (0.00)	-1.52 (0.00)	-0.83 (0.00)	-0.91 (0.00)	-0.35 (0.16)	-0.77 (0.00)	-1.30 (0.00)	-0.61 (0.00)	-0.68 (0.00)	-0.99 (0.00)	-0.77 (0.00)
OI (p-value)	0.04 (0.00)	0.0.4 (0.00)	0.08 (0.00)	0.08 (0.00)	0.15 (0.00)	0.01 (0.40)	0.01 (0.08)	0.07 (0.00)	0.20 (0.00)	0.07 (0.00)	0.07 (0.00)	0.03 (0.00)	0.02 (0.44)	0.07 (0.00)	0.18 (0.00)
R^2	0.71	0.63	0.20	0.48	0.54	0.48	0.62	0.57	0.38	0.61	0.51	0.45	0.45	0.47	0.53
Cases	530	536	532	554	566	574	659	674	708	648	640	677	626	649	8573

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 35: Non-Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1147.04	1540.59	704.51	776.08	1689.82	3267.81	1533.87	4699.15	1608.94	2822.24	1795.87	1596.61	1538.27	1239.18	1280.42
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.19)	(0.00)	(0.00)	(0.00)	(0.27)	(0.00)
BV	0.57	0.78	0.72	0.28	0.71	0.69	0.64	1.11	0.92	0.90	0.60	0.37	0.91	0.85	0.84
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.72	-0.31	0.24	0.43	0.47	0.87	0.85	0.82	0.49	0.45	0.68	-0.83	0.23	-0.64	0.11
(p-value)	(0.00)	(0.50)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.62)	(0.00)	(0.13)
D	17.49	17.75	10.43	15.29	12.87	17.24	8.56	10.30	13.61	12.05	18.31	18.00	15.39	12.90	3.80
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.33	0.41	0.66	0.86	0.84	1.32	0.70	0.41	1.55	1.28	1.15	0.20	0.83	0.54	0.25
(p-value)	(0.04)	(0.00)	(0.00)	(0.00)	(0.000	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	3.92	4.20	6.72	6.47	2.47	4.06	1.81	2.01	3.55	3.77	4.42	3.54	6.13	4.14	0.88
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.81	-0.44	-0.56	-1.24	-1.25	-1.50	-1.07	-0.94	-1.08	-0.80	-0.89	-1.38	-0.40	-0.50	-0.71
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.05	0.14	0.03	0.03	0.04	0.02	0.10	0.06	-0.04	0.03	0.06	0.04	0.05	0.03	0.11
(p-value)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.34)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
R^2	0.58	0.72	0.77	0.57	0.49	0.58	0.53	0.53	0.42	0.49	0.34	0.49	0.54	0.50	0.45
Cases	377	382	379	394	402	408	469	480	504	461	455	482	446	462	6101

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 36: Loss-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	3710.3	1200.50	1299.75	3629.63	682.50	3226.45	1384.21	1237.29	997.77	767.93	1254.12	1255.57	1250.06	1208.36	1251.85
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.50)	(0.00)	(0.00)	(0.00)	(0.22)	(0.33)	(0.00)	(0.00)	(0.00)	(0.17)	(0.00)
BV	0.42	0.95	0.53	0.23	0.66	0.50	0.62	0.91	0.76	0.73	0.74	0.52	0.85	0.82	0.77
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.88	0.55	-0.32	0.25	0.36	1.74	-0.64	-0.42	-0.69	-0.66	-0.28	-0.54	0.58	-0.21	-0.73
(p-value)	(0.00)	(0.00)	(0.04)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)	(0.27)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)
D	10.66	9.11	13.87	9.81	9.30	12.13	9.41	8.17	11.93	7.15	21.44	8.90	12.68	15.12	11.26
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
CEXP	0.76	0.56	0.70	0.95	0.52	0.75	0.54	0.53	0.71	0.78	0.55	0.41	0.34	0.36	0.36
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
RD	6.38	5.23	3.87	5.20	2.31	7.50	5.81	5.44	3.52	5.21	2.53	3.38	6.70	4.74	4.38
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.45	-1.27	-1.79	-1.68	-1.17	-1.42	-1.31	-0.43	-1.26	-0.49	-0.76	-1.05	-0.59	-0.71	-0.78
(p-value)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.07	0.07	0.06	0.07	0.05	0.02	0.00	0.05	0.04	0.09	0.14	0.05	0.07	0.08	0.02
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.08)	(0.09)	(0.98)	(0.24)	(0.26)	(0.06)	(0.00)	(0.00)	(0.13)	(0.06)	(0.34)
R^2	0.73	0.83	0.55	0.67	0.66	0.66	0.60	0.75	0.43	0.58	0.44	0.40	0.43	0.32	0.44
Cases	196	198	197	205	209	212	244	249	262	240	237	251	232	240	3172

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 37: Profit-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Sales as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant (p-value)	-52.88 (0.50)	3870.59 (0.00)	1431.67 (0.00)	2547.87 (0.00)	1472.23 (0.07)	3163.95 (0.00)	1745.79 (0.00)	892.11 (0.00)	1407.33 (0.00)	708.21 (0.00)	1260.73 (0.00)	970.57 (0.00)	1115.56 (0.00)	2289.03 (0.00)	985.50 (0.00)
BV (p-value)	0.42 (0.00)	0.56 (0.00)	0.25 (0.04)	0.21 (0.41)	0.94 (0.00)	0.23 (0.00)	0.62 (0.00)	0.68 (0.00)	0.90 (0.00)	0.74 (0.00)	0.64 (0.00)	0.91 (0.00)	0.61 (0.00)	0.75 (0.00)	0.68 (0.00)
E (p-value)	4.33 (0.00)	3.77 (0.00)	2.70 (0.00)	5.88 (0.00)	5.30 (0.00)	5.29 (0.00)	2.69 (0.00)	2.45 (0.00)	1.19 (0.00)	1.09 (0.00)	1.18 (0.00)	1.11 (0.00)	2.78 (0.00)	4.72 (0.00)	9.76 (0.00)
D (p-value)	11.25 (0.00)	8.77 (0.00)	8.40 (0.00)	13.54 (0.00)	9.00 (0.00)	8.13 (0.00)	11.68 (0.00)	14.35 (0.00)	11.90 (0.00)	9.53 (0.00)	12.02 (0.00)	6.19 (0.00)	8.82 (0.00)	6.55 (0.00)	-2.04 (0.25)
CEXP (p-value)	0.37 (0.03)	0.39 (0.00)	1.29 (0.00)	1.72 (0.00)	1.25 (0.00)	0.98 (0.00)	1.86 (0.00)	0.76 (0.00)	1.66 (0.00)	0.69 (0.00)	0.46 (0.00)	1.61 (0.00)	0.96 (0.00)	0.66 (0.00)	0.85 (0.02)
RD (p-value)	4.68 (0.00)	1.72 (0.00)	2.15 (0.00)	2.19 (0.00)	2.23 (0.00)	6.41 (0.00)	2.84 (0.00)	3.93 (0.00)	2.82 (0.00)	4.93 (0.00)	2.02 (0.00)	3.42 (0.00)	5.68 (0.00)	2.65 (0.00)	3.64 (0.01)
CC (p-value)	-0.96 (0.00)	-1.37 (0.00)	-1.10 (0.00)	-1.40 (0.00)	-1.24 (0.00)	-1.31 (0.00)	-2.00 (0.00)	-2.04 (0.00)	-1.28 (0.00)	-2.51 (0.00)	-1.99 (0.00)	-0.71 (0.00)	-0.39 (0.00)	-1.15 (0.00)	-1.21 (0.00)
OI (p-value)	0.03 (0.00)	0.04 (0.00)	0.05 (0.00)	0.06 (0.00)	0.15 (0.00)	0.01 (0.42)	0.07 (0.00)	0.04 (0.10)	0.22 (0.09)	0.03 (0.00)	0.03 (0.06)	0.26 (0.00)	0.20 (0.00)	0.01 (0.08)	0.03 (0.00)
R^2	0.57	0.54	0.53	0.45	0.57	0.53	0.52	0.51	0.47	0.61	0.51	058	0.48	0.56	0.46
Cases	711	720	714	743	759	770	884	905	950	869	858	908	840	871	11502

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 38: Small Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	729. 52	791.35	562.85	795.62	1137.81	1049.22	1528.81	1445.83	207.30	816.03	814.97	1091.62	1097.03	1293.39	824.70
(p-value)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.39)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.13	0.15	0.33	0.24	0.26	0.10	0.10	0.38	0.41	0.35	0.37	0.10	0.33	0.19	0.26
(p-value)	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.25)	(0.09)	(0.00)	(0.00)	(0.00)	(0.00)	(0.10)	(0.00)	(0.01)	(0.00)
E	-0.03	0.26	0.10	0.41	0.54	0.63	0.30	0.26	0.47	-0.03	0.08	0.16	0.15	0.15	0.13
(p-value)	(0.37)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.04)	(0.03)	(0.00)	(0.61)	(0.03)	(0.00)	(0.00)	(0.04)	(0.00)
D	9.88	7.28	3.38	5.30	10.44	4.97	6.72	3.52	3.14	8.64	2.46	8.21	5.47	2.11	4.93
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.01)	(0.00)
CEXP	0.18	0.41	0.22	0.67	0.38	0.92	0.54	0.31	0.18	0.35	0.17	0.88	0.47	0.14	0.41
(p-value)	(0.01)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.03)	(0.05)	(0.01)	(0.04)	(0.00)	(0.00)	(0.06)	(0.04)
RD	1.04	1.43	1.17	3.99	3.08	1.38	1.67	1.20	3.49	1.00	1.15	1.23	1.32	1.30	0.69
(p-value)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
CC	-0.13	-0.20	-0.89	-0.27	-0.90	-0.69	-0.30	-0.38	-0.23	-0.32	-0.97	-0.30	-0.22	-0.27	-0.31
(p-value)	(0.12)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.03)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	0.03	0.07	0.01	0.01	0.19	0.26	-0.16	0.02	-0.06	0.02	0.26	0.07	0.09	0.00	0.02
(p-value)	(0.07)	(0.00)	(0.03)	(0.09)	(0.00)	(0.00)	(0.01)	(0.28)	(0.03)	(0.26)	(0.00)	(0.00)	(0.04)	(0.96)	(0.02)
R^2	-0.73	-0.24	-0.60	-0.40	-0.70	-0.85	-0.47	-0.62	-0.53	-0.67	-0.56	-1.60	-1.55	-1.74	-1.95
Cases	296	302	301	310	318	326	360	407	403	366	350	374	354	370	4837

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 39: Medium Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	860.45	489.20	223.57	539.25	363.81	1210.86	-265.55	1149.09	712.18	2158.10	1657.91	819.32	495.63	303.54	933.90
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.58)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.03)	(0.54)	(0.00)
BV	0.19	0.10	0.41	0.31	0.39	0.20	0.55	0.18	0.49	0.26	0.24	0.32	0.33	0.28	0.21
(p-value)	(0.00)	(0.31)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.25)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.15	0.26	0.75	0.27	0.21	-0.01	0.24	0.47	0.76	0.74	0.60	0.21	-0.07	0.61	0.21
(p-value)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.01)
D	14.29	13.10	8.67	14.14	12.88	15.92	12.17	7.07	6.39	4.45	6.46	10.79	12.09	6.74	12.22
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.76)
CEXP	0.82	0.71	0.32	0.62	0.46	0.34	1.68	1.09	0.19	0.96	0.62	0.59	0.47	0.95	0.82
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	().00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	2.47	1.08	3.82	5.62	4.92	7.70	2.70	2.46	3.57	1.87	2.80	2.46	4.06	2.44	2.05
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.47	-0.40	-1.00	-1.20	-0.90	-0.96	-0.30	-1.06	-0.84	-1.12	-0.85	-0.78	-0.77	-0.33	-0.79
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	-0.10	0.44	0.27	0.01	0.06	0.26	0.57	-0.04	0.14	0.64	0.05	0.17	0.45	0.96	0.63
(p-value)	(0.03)	(0.00)	(0.00)	(0.09)	(0.04)	(0.00)	(0.00)	(0.62)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-1.04	-1.00	-0.52	-0.95	-0.52	-0.67	-0.43	-0.43	-48	-1.17	-1.41	-0.49	-0.44	-0.43	-1.35
Cases	296	302	301	310	318	326	360	407	403	366	350	374	354	370	4837

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 40: Large Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	652.73	4527.63	3473.99	1501.17	1350.66	2381.54	1772.19	1248.08	778.17	2589.19	1676.55	600.08	2921.52	3135.14	1971.95
(p-value)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.30)	(0.00)	(0.00)	(0.00)
BV	0.75	0.67	0.22	0.54	0.52	0.54	0.17	0.56	0.55	0.16	0.76	0.58	0.59	0.65	0.53
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.09	0.16	0.65	0.62	0.63	-0.02	0.69	0.35	0.43	0.54	-0.01	0.73	-0.20	-0.08	-0.12
(p-value)	(0.49)	(0.00)	(0.00)	(0.00)	(0.00)	(0.87)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.58)	(0.03)	(0.11)
D	8.36	15.44	18.56	11.35	18.01	12.51	19.47	12.75	3.91	6.34	8.22	17.53	6.45	8.31	9.52
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(.00)	(0.00)	(0.00)	(0.00)
CEXP	0.81	0.86	0.64	0.67	0.34	0.89	0.23	1.55	1.64	0.30	1.32	0.63	1.56	1.48	1.10
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	2.96	4.55	4.61	6.48	9.42	5.69	7.38	4.61	3.94	5.34	3.98	6.51	4.34	4.30	2.28
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.12	-0.87	-0.78	-0.58	-0.68	-0.61	-1.22	-0.34	-0.45	-1.63	-1.25	-0.87	-0.49	-0.22	-0.53
(p-value)	(0.39)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.13)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
OI	0.75	0.51	0.40	0.91	0.21	0.97	0.90	0.71	1.20	0.83	0.99	0.75	0.53	0.86	0.81
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.28	-0.32	-0.10	-0.29	-0.28	-0.16	-0.22	-0.32	-0.50	-0.07	-0.24	-0.48	-0.39	-0.01	-0.15
Cases	298	302	302	312	318	328	362	408	403	366	352	375	356	372	4854

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 41: Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Const	920.42	3248.80	2401.38	1016.02	1795.38	2453.31	1879.03	1659.57	898.97	2525.32	1643.66	913.91	2194.19	2513.95	1694.36
(p-value)	(0.05)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.47	0.31	0.28	0.35	0.30	0.51	0.33	0.57	0.56	0.63	0.57	0.46	0.41	0.34	0.51
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.65	-0.11	0.26	1.00	0.84	0.12	0.81	0.24	0.20	0.82	0.68	0.75	-0.07	0.94	-0.18
(p-value)	(0.00)	(0.47)	(0.00)	(0.00)	(0.00)	(0.07)	(0.00)	(0.28)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)
D	7.13	15.75	10.73	12.05	17.30	8.36	11.41	7.25	4.71	14.53	14.27	11.55	8.20	13.76	10.34
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	().00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	1.40	0.30	1.02	1.20	0.50	1.31	1.55	1.32	1.19	0.99	0.88	0.65	1.47	1.52	0.74
(p-value)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	6.68	4.17	5.43	7.09	7.70	5.36	4.33	5.84	2.96	7.42	5.39	6.22	4.85	5.54	4.91
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CC	-0.30	-0.71	-0.87	-1.21	-0.27	-0.77	-1.42	-0.67	-0.89	-1.63	-1.12	-0.88	-0.61	-0.26	-0.80
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)
OI	0.17	0.34	0.14	0.30	0.59	0.81	0.60	0.27	0.48	0.54	0.62	0.24	0.33	0.53	0.43
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.33	-0.29	-0.10	-0.52	-0.33	-0.06	-0.25	-0.22	-0.29	-0.05	-0.10	-0.28	-0.05	-0.30	-0.14
Cases	519	528	527	544	556	572	631	713	705	640	614	655	621	649	8474

Notes:
MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 42: Non-Manufacturing Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	1182.40	1691.36	1562.49	1130.29	1124.04	2236.72	1830.64	1557.29	1095.69	2235.29	3655.17	1599.33	1374.74	2810.92	1568.60
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
BV	0.39	0.37	0.65	0.68	0.68	0.35	0.28	0.56	0.77	0.34	0.39	0.38	0.71	0.63	0.61
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.12)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
E	0.15	0.48	-0.83	0.48	-0.35	0.25	0.36	0.17	0.63	0.26	0.46	0.33	0.16	0.19	-0.07
(p-value)	(0.03)	(0.00)	(0.35)	(0.00)	(0.09)	(0.00)	(0.01)	(0.02)	(0.00)	(0.01)	(0.00)	(0.04)	(0.00)	(0.09)	(0.43)
D	13.55	9.63	5.58	8.14	14.10	15.31	15.68	6.43	4.39	12.92	6.98	12.22	8.44	3.39	4.72
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.90	1.64	0.39	0.44	0.90	0.77	0.37	1.72	0.19	0.59	1.82	1.52	0.44	0.74	0.59
(p-value)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)
RD	3.52	3.62	4.43	5.15	6.90	4.94	3.34	3.91	2.33	4.54	4.41	4.06	3.82	1.90	2.53
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)
CC	-0.87	-1.17	-0.25	-0.43	-1.61	-0.90	-0.66	-0.45	-0.22	-1.65	-0.61	-0.50	-0.62	-0.53	-0.40
(p-value)	(0.00)	(0.00)	(0.10)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
OI	0.20	0.50	0.52	0.54	0.73	0.36	0.48	0.47	0.32	0.39	0.27	0.24	0.38	0.56	0.33
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.08	-0.33	-0.05	-0.10	-0.10	-0.43	-0.18	-0.34	-0.52	-0.17	-0.10	-0.19	-0.10	-0.07	-0.11
Cases	371	378	377	388	398	408	451	509	504	458	438	468	443	463	6054

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 43: Loss-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant (p-value)	826.04 (0.19)	3174.11 (0.00)	3650.99 (0.00)	1818.78 (0.00)	1023.48 (0.00)	5143.42 (0.00)	1782.55 (0.00)	1442.06 (0.00)	529.98 (0.00)	2428.78 (0.00)	1483.93 (0.00)	749.67 (0.04)	1883.08 (0.00)	1164.76 (0.00)	1397.74 (0.00)
BV (p-value)	0.31 (0.00)	0.32 (0.00)	0.47 (0.00)	0.39 (0.00)	0.41 (0.00)	0.20 (0.11)	0.27 (0.00)	0.47 (0.00)	0.76 (0.00)	0.39 (0.00)	0.43 (0.00)	0.66 (0.00)	0.67 (0.00)	0.60 (0.00)	0.53 (0.00)
E (p-value)	0.27 (0.00)	-0.18 (0.36)	-0.38 (0.00)	0.10 (0.07)	-0.41 (0.00)	-0.28 (0.00)	0.35 (0.00)	-0.40 (0.00)	-0.27 (0.06)	-0.30 (0.10)	-0.49 (0.03)	-0.21 (0.32)	0.17 (0.33)	0.16 (0.05)	-0.23 (0.00)
D (p-value)	12.79 (0.00)	5.16 (0.00)	9.59 (0.00)	6.61 (0.00)	10.48 (0.00)	19.37 (0.00)	17.19 (0.00)	4.65 (0.00)	6.81 (.00)	16.07 (0.00)	7.73 (0.00)	3.91 (0.00)	12.86 (0.00)	15.94 (0.00)	3.54 (0.00)
CEXP (p-value)	0.85 (0.00)	0.92 (0.00)	0.87 (0.00)	1.06 (0.00)	0.27 (0.01)	0.38 (0.00)	0.70 (0.00)	1.08 (0.00)	0.65 (0.00)	0.39 (0.03)	0.98 (0.00)	0.66 (0.00)	0.64 (0.00)	0.53 (0.00)	0.49 (0.02)
RD (p-value)	9.99 (0.00)	4.57 (0.00)	3.11 (0.00)	5.43 (0.00)	7.62 (0.00)	6.85 (0.00)	2.66 (0.00)	2.42 (0.02)	2.52 (0.00)	6.10 (0.00)	3.77 (0.00)	1.06 (0.00)	4.25 (0.00)	7.05 (0.00)	1.24 (0.01)
CC (p-value)	-0.47 (0.00)	-0.59 (0.00)	-0.86 (0.00)	-0.46 (0.00)	-0.66 (0.00)	-0.96 (0.00)	-1.40 (0.00)	-0.64 (0.00)	-0.17 (0.10)	-1.68 (0.00)	-1.24 (0.00)	-0.49 (0.00)	-0.19 (0.00)	-0.32 (0.00)	-0.60 (0.00)
OI (p-value)	0.15 (0.00)	0.60 (0.00)	0.52 (0.00)	0.28 (0.00)	0.44 (0.00)	0.40 (0.00)	0.36 (0.00)	0.15 (0.00)	0.38 (0.00)	0.26 (0.00)	0.34 (0.00)	0.13 (0.00)	0.19 (0.00)	0.80 (0.00)	0.22 (0.00)
R^2	-0.22	-0.38	-0.22	-0.20	-0.10	-0.18	-0.46	-0.06	-0.01	-0.07	-0.17	-0.02	-0.42	-0.16	-0.10
Cases	191	194	194	200	205	210	232	262	259	235	226	241	228	238	3115

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Appendix 44: Profit-Making Firms: Results from the Estimation Model for the Years 1990-2003 and Pooled Sample (Opening Market Value as Deflator)

$$MV = \alpha_0 + \alpha_1 BV + \alpha_2 E + \alpha_3 D + \alpha_4 CEXP + \alpha_5 RD + \alpha_6 CC + \alpha_7 OI + \varepsilon$$

Variable	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	Pooled
Constant	759.29	2485.20	1825.69	1247.26	1688.17	1541.22	1367.35	744.25	579.31	1389.08	2126.04	1548.33	773.57	2704.90	1523.88
(p-value)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.26)	(0.30)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)
BV	0.55	0.39	0.62	0.41	0.12	0.29	0.26	0.42	0.78	0.39	0.26	0.34	0.35	0.36	0.40
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.34)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)
E	-0.58	0.78	4.24	2.98	1.56	3.00	3.45	4.20	2.28	4.86	2.47	1.11	1.16	0.90	1.66
(p-value)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
D	11.97	12.65	13.45	5.06	7.40	15.79	5.54	12.42	6.28	7.53	6.16	10.43	10.42	3.24	7.30
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
CEXP	0.32	0.52	0.87	1.07	0.25	0.73	0.89	1.15	0.45	0.79	0.88	0.78	0.81	1.11	0.80
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	().00)	(0.00)	(0.00)	(0.00)	(0.00)
RD	6.42	6.03	3.49	4.91	2.46	5.80	2.27	1.73	1.59	1.32	3.09	1.16	3.69	1.18	1.50
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.17)	(0.14)	(0.05)	().00)	(0.04)	(0.00)	(0.07)	(0.02)
CC	-0.35	-1.11	-0.17	-0.72	-0.92	-0.65	-1.18	-0.42	-0.95	-1.38	-1.04	-0.70	-1.51	-0.51	-0.56
(p-value)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
OI	-0.22	0.32	0.19	0.67	0.73	0.71	0.73	0.73	0.45	0.79	0.42	0.76	0.48	0.53	0.52
(p-value)	(0.02)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
R^2	-0.26	-0.12	-0.48	-0.35	-0.33	-0.23	-0.10	-0.15	-0.33	-0.21	-0.34	-0.24	-0.22	-0.16	-0.19
Cases	699	712	710	732	749	770	850	960	950	863	826	882	836	874	11413

Notes:

MV is market value; BV is book value; E is earnings; RD is research and development expenditures; D is dividends; CC is capital contributions; CEXP is capital expenditures; and OI is other information. All regressions are performed using White's (1980) heteroscedasticity correction.

Bibliography

Afshar, K., R. Taffler and P. Sudersanam, (1992), 'The Effects of Corporate Divestments on Shareholder Wealth: The UK Experience', *Journal of Banking and Finance*, Vol. 16, No. 1, pp. 115-135.

Aharony, J. and I. Swary, (1980), 'Quarterly Divided and Earnings Announcements and Stockholders' Returns: An Empirical Analysis', *Journal of Finance*, Vol. 35, No. 1, pp. 1-12.

Aitken, M. and R. Czernkowski, (1992), 'Information Leakage prior to Takeover Announcements: The Effect of Media Reports', *Accounting and Business Research*, Vol. 23, No. 89, pp. 3-20.

Akbar, S. (2001), 'Valuation Relevance and Disaggregations of Earnings and Book Value: Some UK Evidence', PhD Thesis, Manchester Business School, The University of Manchester.

Akbar, S. and A. Stark, (2003a), 'Discussion of Scale and the Scale Effect in Market-Based Accounting Research', *Journal of Business Finance & Accounting*, Vol. 30, No. (1&2), pp. 57-72.

Akbar, S. and A. Stark, (2003b), 'Deflators, Net Shareholder Cash Flows, Dividends, Capital Contributions and Estimated Models of Corporate Valuation', *Journal of Business Finance & Accounting*, Vol. 30, No. (9&10), pp. 1211-1233.

Ali, A. (1994), 'The Incremental Information Content of Earnings, Working Capital from Operation, and Cash Flow', *Journal of Accounting Research*, Vol. 32, No. 1, pp. 61-74.

Ali, A. and P. Pope, (1995), 'The Incremental Information Content of earnings, Funds Flow and Cash Flow: The UK Evidence', *Journal of Business Finance & Accounting*, Vol. 22, No. 1, pp. 19-34.

Al-Qudah, K., (1991), 'Capital expenditures Decisions and Company Market Value: A Study of Information Flows and Associated Share Price Movements', PhD Thesis, University of Dundee.

Al-Qudah, K., M. Walker and A. Lonie, (1991), 'The Accessibility and perceived Usefulness of Information on the Capital expenditures Intentions of UK Quoted Companies', *Accounting and Business Research*, Vol. 22, No. 85, pp. 3-12.

Ambarish, R., K. John and J. Williams, (1987), 'Efficient Signalling with Dividends and Investments', *Journal of Finance*, Vol. 42, No. 2, pp. 321-343.

Amir, E. and B. Lev, (1996), 'Value-Relevance of Non-Financial Information: The Wireless Communications Industry', *Journal of Accounting and Economics*, Vol. 22, No. (1&2), pp. 3-30.

Anderson, C. and L. Garcia-Feijoo, (2002), 'Empirical Evidence on Capital Investment, Growth Options, and Security Returns', Working Paper, School of Business, University of Kansas.

Asquith, P. and D. Mullins, (1983), 'The Impact of Initiating Dividends Payments on Shareholders' Wealth', *Journal of Business*, Vol. 56, No. 1, pp. 77-96.

Asquith, P. and D. Mullins, (1986), 'Equity Issues and Offering Dilution', *Journal of Financial Economics*, Vol. 15, No. (1&2), pp. 61-89.

Assiri, B. (1993), 'The Simultaneous Determination of Corporate Investment and Shareholder Value', Unpublished PhD Thesis, The University of Manchester.

Ball, R. (1978), 'Anomalies in Relationships between Securities' Yields and Yield Surrogates', *Journal of Financial Economics*, Vol. 6, No. (2&3), pp. 103-126.

Ball, R., and P. Brown, (1968), 'An Empirical Analysis of Accounting Income Numbers', *Journal of Accounting Research*, Vol. 6, No. 2, pp. 159-178.

Ball, R., and P. Brown, (1969), 'Portfolio Theory and Accounting', *Journal of Accounting Research*, Vol. 7, No. 2, pp. 300-323.

Ballester, M., J. Livnat and N. Sinha, (1999), 'Corporate Reorganisations: Changes in the Intensity of Labour and Capital expendituress', *Journal of Business Finance & Accounting*, Vol. 26, No. (9&10), pp. 1205-1244.

Barlev, B. and H. Levy, (1981), 'The Information Content of Accounting Data and the Management of Security Portfolios', *Journal of Business Finance & Accounting*, Vol. 8, No. 2, pp. 221-248.

Barth, M. (2000), 'Valuation-Based Accounting Research: Implications for Financial Reporting and Opportunities for Future Research', *Accounting and Finance*, Vol. 40, No. 1, pp. 7-31.

Barth, M. and G. Clinch, (1998), 'Revalued Financial, Tangible, and Intangible Assets: Associations with Share Prices and Non-Market-based Value Estimates', *Journal of Accounting Research*, Vol. 36, Supplement, pp. 199-233.

Barth, M. and S. Kallapur, (1996), 'The Effects of Cross-Sectional Scale Differences on Regression Results in Empirical Accounting Research', *Contemporary Accounting Research*, Vol. 13, No. 2, pp. 527-567.

Barth, M., W. Beaver and W. Landsman, (2001), 'The Relevance of the Value Relevance Literature for Financial Accounting Standard Setting: Another View', Working Paper, Stanford University.

Bar-Yosef, S., J. Callen and J. Livnat, (1996), 'Modeling Dividends, Earnings, and Book Value Equity: An Empirical Investigation of the Ohlson Valuation Dynamics', *Review of Accounting Studies*, Vol. 1, No. 3, pp. 207-224.

Basu, S. (1977), 'Investment Performance of Common Stocks in Relation to Their Price-Earnings Ratios: A Test of the Efficient Market Hypothesis', *Journal of Finance*, Vol. 32, No. 3, pp. 662-682.

Basu, S. (1983), 'The relationship between Earnings' Yield, Market Value, and Return for NYSE Common Stocks: Further Evidence', *Journal of Financial Economics*, Vol. 12, No. 1, pp.129-156.

Bauman, M. and S. Das, (2004), 'Stock Market Valuation of Deferred Tax Assets: Evidence from Internet Firms', *Journal of Business Finance & Accounting*, Vol. 31, No. (9&10), pp. 1223-1260.

Baumol, W. (1962), 'On the Theory of Expansion of the Firm', *American Economic Review*, Vol. 52, No. 5, pp. 1078-1087.

Beaver, W. (1968), 'The Information Content of Annual Earnings Announcements', *Journal of Accounting Research*, Vol. 6, Supplement, pp. 67-92.

Beaver, W., R. Lambert and D. Morse, (1980), 'The Information Content of Security Prices', *Journal of Accounting and Economics*, Vol. 2, No. 1, pp. 3-28.

Beaver, W., R. Lambert and D. Ryan, (1987), 'The Information Content of Security Prices: A Second Look', *Journal of Accounting and Economics*, Vol. 9, No. 2, pp. 139-157.

Beaver, W. and J. Manegold, (1975), 'The Association between Market-Determined and Accounting-Determined Measures of Systematic Risk: Some Further Evidence', *Journal of Financial and Quantitative Analysis*, Vol. 10, No. 2, pp. 231-284.

Beaver, W. and R. Dukes, (1972), 'Inter-period Tax Allocation, Earnings Expectations and the Behavior of Security Prices', *Accounting Review*, Vol. 47, No. 2, pp. 320-332.

Belsely, D., E. Kuh and R.E. Welsch, (1980), '*Regression Diagnostics: Identifying Influential Data and Sources of Multicollinearity*', New York: Wiley.

Ben-Zion, U. (1984), 'The R&D and Investment Decision and Its Relationship to the Firm's Market Value: Some Preliminary Results in R&D, Patent, and Productivity (edited by Z. Griliches), Chicago: The University of Chicago Press.

Bernard, V. (1987), 'Cross-Sectional Dependence and Problems of Inference in Market-Based Accounting Research', *Journal of Accounting Research*, Vol. 25, No. 1, pp. 1-48.

Bernard, V. (1995), 'The Feltham-Ohlson Framework: Implication for Empiricists', *Contemporary Accounting Research*, Vol. 11, No. 2, pp. 733-747.

Bernard, V. and T. Stober, (1989), 'The Nature and Amount of Information in Cash Flows and Accruals', *The Accounting Review*, Vol. 64, No. 4, pp. 624-652.

Bhattacharya, U., H. Daouk, B. Jorgenson and C. Kehr, (2000), 'When an Event is not an Event: The Curious Case of an Emerging Market', *Journal of Financial Economics*, Vol. 55, No. 1, pp. 69-101.

Black, F. and M. Scholes, (1972), 'The Valuation of Option Contracts and a Test of Market Efficiency', Journal of Finance, Vol. 27, No. 2, pp. 399-417.

Blackwell, D., M. Marr and M. Spivey, (1990), 'Plant-Closing Decisions and the Market Value of the Firm', *Journal of Financial Economics*, Vol. 26, No. 2, pp. 277-288.

Blanchard, O., F. Lopez-De-Silanes and A. Shleifer, (1994), 'What Do Firms Do with Cash Windfalls?' *Journal of Financial Economics*, Vol. 36, No. 3, pp. 337-360.

Blose, L. and J. Shieh, (1997), 'Tobin's Q-Ratio and Market Reaction to Capital Investment Announcements', *The Financial Review*, Vol. 32, No. 3, pp. 449-476.

Blume, M. and R. Stanbaugh, (1983), 'Biases in Computed Returns: An Application to the Size Effect', *Journal of Financial Economics*, Vol. 12, No. 3, pp. 387-404.

Blume, M. and I. Friend, (1973), 'A New Look at the Capital Asset Pricing Model', *Journal of Finance*, Vol. 28, No. 1, pp. 19-33.

Bommel, J. and T. Vermaelen, (2003), 'Post-IPO Capital expendituress and Market Feedback', *Journal of Banking & Finance*, Vol. 27, No. 2, pp. 275-305.

Born, A. and H. Ryan Jar, (2000), 'Capital expenditures Announcements and Anti-Takeover Barriers', *The Quarterly Review of Economics and Finance*, Vol. 40, No. 2, pp. 205-228.

Bowen, R. (1981), 'Valuation of Earnings Components in the Electric Utility Industry', *The Accounting Review*, Vol. 56, No. 1, pp. 1-22.

Bowen, R., D. Burgstahler, and L. Daley, (1987), 'The Incremental Information Content of Accrual versus Cash Flows', The Accounting Review, Vol. 62, No. 4, pp. 723-747.

Brailsford, T. and D. Yeoh, (2004), 'Agency Problems and Capital expenditures Announcements', Journal of Business, Vol. 77, No. 2, pp. 223-256.

Brealey, R. and S. Myers, (2003), '*Principles of Corporate Finance*', 7th Edition, Boston, Mass., McGraw-Hill.

Brickley, J. (1983), 'Shareholder Wealth, Information Signalling and the Specially Designated Dividend: An Empirical Study', *Journal of Financial Economics*, Vol. 12, No. 2, pp. 187-209.

Brown, S. and J. Warner, (1980), 'Measuring Security Price Performance', *Journal of Financial Economics*, Vol. 8, No. 3, pp. 205-258.

Brown, S. and J. Warner, (1985), 'Using Daily Stock Returns: The Case of Event Studies', *Journal of Financial Economics*, Vol. 14, No. 1, pp. 3-31.

Burton, B., A. Lonie, and D. Power, (1999), 'The Stock Market Reaction to Investment Announcements: The Case of Individual Capital expenditures Projects', *Journal of Business Finance & Accounting*, Vol. 26, No. (5&6), pp. 681-709.

Cahan, S., S. Courtenay, P. Gronewoller and D. Upton, (2000), 'Value Relevance of Mandated Comprehensive Income Disclosures', *Journal of Business Finance & Accounting*, Vol. 27, No. (9&10), pp. 1273-1301.

Chambers, D., R. Jennings and R. Thompson, (1999), 'Evidence on the Usefulness of Capital expendituress as an Alternative Measure of Depreciation', *Review of Accounting Studies*, Vol. 4, No. (3&4), pp. 169-195.

Chan, L., J. Lakonishok and T. Sougiannis, (2001), 'The Stock Market Valuation of Research and Development Expenditures', *Journal of Finance*, Vol. 56, No. 6, pp. 2431-2456.

Chan, S., J. Martin and J. Kensinger, (1990), 'Corporate Research and Development Expenditures and Share Value', *Journal of Financial Economics*, Vol. 26, No. 2, pp. 255-276.

Chan, S., W. Gau and K. Wang, (1995), 'Stock Market Reaction to Capital Investment Decisions: Evidence from Business Relocations', *Journal of Financial and Quantitative Analysis*, Vol. 30, No. 1, pp. 81-100.

Chaney, P. and T. Devinney, (1992), 'New Product Innovations and Stock Price Performance', *Journal of Business Finance & Accounting*, Vol. 19, No. 5, pp. 677-695.

Chauvin, K. and M. Hirschey, (1993), 'Advertising, R&D Expenditures and the Market Value of the Firm', *Financial Management*, Vol. 22, No. 4, pp. 128-140.

Chauvin, K. and M. Hirschey, (1994), 'Goodwill, Profitability, and the Market Value of the Firm', *Journal of Accounting and Public Policy*, Vol. 13, No. 2, pp. 159-180.

Chen, S. and K. Ho, (1997), 'Market Response to Product-Strategy and Capital-Expenditure Announcements in Singapore: Investment Opportunities and Free Cash Flow', *Financial Management*, Vol. 26, No. 3, pp. 82-88.

Christie, A. (1987), 'On Cross-Sectional Analysis in Accounting Research', *Journal of Accounting and Economics*, Vol. 9, No. 3, pp. 231-258.

Christie, A. (1982), 'The Stochastic Behaviour of Common Stock Variances: Value, Leverage and Interest Rate Effects', *Journal of Financial Economics*, Vol. 10, No. 4, pp. 407-432.

Chung, K., P. Wright and C. Charoenwong, (1998), 'Investment Opportunities and Market Reaction to Capital expenditures Decisions', *Journal of Banking & Finance*, Vol. 22, No. 1, pp. 41-60.

Clubb, C. (1995), 'An Empirical Study of the Information Content of Accounting Earnings, Funds Flows and Cash flows in the UK', *Journal of Business Finance & Accounting*, Vol. 22, No. 1, pp. 35-52.

Cockburn, I. and Z. Griliches, (1988), 'Industry Effects and Appropriability Measures in the Stock Market's Valuation of R & D and Patents', *American Economic Review*, Vol. 78, No. 2, pp. 419-423.

Collins, D., E. Maydew and I. Weiss, (1997), 'Changes in the Value-Relevance of Earnings and Book Values over the Past Forty years', *Journal of Accounting and Economics*, Vol. 24, No. 1, pp. 39-67.

Collins, D., M. Pincus and H. Xie, (1999), 'Equity Valuation and Negative Earnings: The Role of Book Value of Equity', *The Accounting Review*, Vol. 74, No. 1, pp. 29-61.

Connolly, R. and M. Hirschey, (1990), 'Firm Size and R & D Effectiveness: A Value-Based Test', *Economics Letters*, Vol. 32, No. 3, pp. 289-294.

Copeland, T., J. Weston and K. Shastri, (2005), '*Financial Theory and Corporate Policy*', 4th Edition, Boston, Mass, London: Pearson Addison Wesley.

Corhay, A. and A. Tourani Rad, (1996), 'Conditional Heteroskedasticity Adjusted Market Model and an Event Study', *Quarterly Review of Economics and Finance*, Vol. 36, No. 4, pp. 529-538.

Dann, L. (1981), 'Common Stock Repurchases: An Analysis of Returns to Bondholders and Stockholders', *Journal of Financial Economics*, Vol. 9, No. 2, pp. 113-138.

Dann, L. and W. Mikkelson, (1984), 'Convertible Debt Issuance, Capital Structure Change and Financing-Related Information: Some New Evidence', *Journal of Financial Economics*, Vol. 13, No. 2, pp. 157-186.

DeAngelo, H., L. DeAngelo and D. Skinner, (1992), 'Dividend and Losses', *Journal of Finance*, Vol. 47, No. 5, pp. 1837-1863.

Dechow, P. (1994), 'Accounting Earnings and Cash Flow as Measures of Firm Performance: The Role of Accounting Accruals', *Journal of Accounting and Economics*, Vol. 18, No. 1, pp. 3-42.

Dechow, P., A. Hutton and R. Sloan, (1999), 'An Empirical Assessment of the Residual Income Valuation Model', *Journal of Accounting and Economics*, Vol. 26, No. (1-3), pp. 1-34.

Del-Brio, E., J. Perote, and J. Pindado, (2003), 'Measuring the Impact of Corporate Investment Announcements on Share Prices: The Spanish Experience', *Journal of Business Finance & Accounting*, Vol. 30, No. (5&6), pp. 715-747.

Denning, K. and K. Shastri, (1990), 'Single Sale Divestments: The Impact on Stockholders and Bondholders', *Journal of Business Finance & Accounting*, Vol. 17, No. 5, pp. 731-743.

Dhillon, U. and H. Johnson, (1994), 'The Effect of Dividend Changes on Stock and Bond Prices', *Journal of Finance*, Vol. 49, No.1, pp. 281-289.

Dielman, T. and H. Oppenheimer, (1984), 'An Examination of Investor Behaviour During Periods of Large Dividend Changes, *Journal of Financial and Quantitative Analysis*, Vol. 19, No. 2, pp. 197-216.

Dimson, E. and P. Marsh, (1986), 'Event Study Methodologies and the Size Effect: The Case of UK Press Recommendations', *Journal of Financial Economics*, Vol. 17, No. 1, pp. 113-142.

Dodd, P. and J. Warner, (1983), 'On Corporate Governance: A Study of Proxy Contests', *Journal of Financial Economics*, Vol. 11, No. (1-4), pp. 401-438.

Dyckman, T., D. Philbrick and J. Stephen, (1984), 'A Comparison of Event Study Methodologies Using Daily Stock Returns: A Simulation Approach', *Journal of Accounting Research*, Vol. 22, Supplement, pp. 1-30.

Eades, K. (1982), 'Empirical Evidence on Dividends as a Signal of Firm Value', *Journal of Financial and Quantitative Analysis*, Vol. 17, No. 4, pp. 471-500.

Easton, P. (1998), 'Discussion of Re-valued Financial, Tangible, and Intangible Assets: Association with Share Prices and non-market-based value estimates', *Journal of Accounting Research*, Vol. 36, Supplement, pp. 235-247.

Easton, P. (1999), 'Security Returns and the Value Relevance of Accounting Data', *Accounting Horizons*, Vol. 13, No. 4, pp. 399-412.

Easton, P. and G. Sommers, (2003), 'Scale and Scale Effects in Market-Based Accounting Research', *Journal of Business Finance & Accounting*, Vol. 30, No. (1&2), pp. 25-55.

Easton, P. and T. Harris, (1991), 'Earnings as an Explanatory Variable for Returns', *Journal of Accounting Research*, Vol. 29, No. 1, pp. 19-36.

Easton, P. (1985), 'Accounting Earnings and Security Valuation: Empirical Evidence of the Fundamental Links', *Journal of Accounting Research*, Vol. 23, Supplement, pp. 54-77.

Elloitt, J. and H. Uphoff, (1972), 'Predicting the Near Term Profit and Loss Statement with an Econometric Model: A Feasibility Study', *Journal of Accounting Research*, Vol. 10, No. 2, pp. 259-274.

Ellsworth, E. (1985), 'Capital Markets and Competitive Decline', *Harvard Business Review*, Vol. 63, No. 5, pp. 171-183.

Fama, E. and M. Jensen, (1985), 'Organizational Forms and Investment Decisions', *Journal of Financial Economics*, Vol. 14, No. 1, pp. 101-119.

Fama, E. and M. Miller, (1972), '*The Theory of Finance*', Holt, Rinehart & Winston, New York.

Fama, E., L. Fisher, M. Jensen and R. Roll, (1969), 'The Adjustment of Stock Prices to New Information', *International Economic Review*, Vol. 10, No. 1, pp. 1-21.

Fazzari, S., R. Hubbard and B. Petersen, (1988), 'Financing Constraints and Corporate Investment', *Brookings Papers on Economic Activity*, Vol. 1988, No. 1, pp. 141-206.

Feltham, G. and J. Ohlson, (1995), 'Valuation and Clean Surplus Accounting for Operating and Financial Activities', *Contemporary Accounting Research*, Vol. 11, No. 2, pp. 689-731.

Feltham, G. and J. Ohlson, (1996), 'Uncertainty Resolution and the Theory of Depreciation Measurement', *Journal of Accounting Research*, Vol. 34, No. 2, pp. 209-234.

Fieldsend, S., N. Longford and S. McLeay, (1987), 'Industry Effects and the Proportionality Assumption in Ration Analysis: A Variance Component Analysis', *Journal of Business Finance & Accounting*, Vol. 14, No. 4, pp. 497-517.

Friend, I. (1977), 'Recent Development in Finance', *Journal of Banking and Finance*, Vol. 1, No. 2, pp. 103-117.

Garrod, N. and M. Hadi, (1998), 'Investor Response to Cash Flow Information', *Journal of Business Finance & Accounting*, Vol. 25, No. (5&6), pp. 613-630.

Garrod, N. and W. Rees, (1998), 'International Diversification and Firm Value', *Journal of Business Finance & Accounting*, Vol. 25, No. (9&10), pp. 1255-1282.

Gobola, M. and G. Tsetsekos, (1992), 'The Information Content of Plant Closing Announcements: Evidence from Financial Profiles and the Stock Price Reaction', *Financial Management*, Vol. 21, No. 2, pp. 31-40.

Gonedes, N. (1978), 'Corporate Signalling, External Accounting, and Capital Market Equilibrium: Evidence on Dividends, Income, and Extraordinary Items', *Journal of Accounting Research*, Vol. 16, No. 1, pp. 26-79.

Gordon, L. and R. Iyengar, (1996), 'Return on Investment and Corporate Capital expendituress: Empirical Evidence', *Journal of Accounting and Public Policy*, Vol. 15, No. 4, pp. 305-325.

Goodacre, A. and J. McGrath, (1997), 'An Experimental Study of Analysts' Reactions to Corporate R&D Expenditure', *British Accounting Review*, Vol. 29, No. 2, pp. 155-179.

Graham, R., C. Lefanowicz and K. Petroni, (2003), 'The Value Relevance of Equity Method Fair Value Disclosures', *Journal of Business Finance & Accounting*, Vol. 30, No. (7&8), pp. 1065-1088.

Green, J. (1999), 'The Impact of the Quality of Earnings on the Valuation Relevance of Cash Flow Disclosures', *British Accounting Review*, Vol. 31, No. 4, pp. 387-413.

Green, J., A. Stark and H. Thomas, (1996), 'U. K. Evidence on the Market Valuation of Research and Development Expenditures', *Journal of Business Finance & Accounting*, Vol. 23, No. 2, pp. 191-216.

Greenball, M. (1971), 'A Statistical Model of Earnings Estimation', *Journal of Accounting Research*, Vol. 9, Supplement, pp.172-190.

Griliches, Z. (1981), 'Market value, R & D, and Patents', *Economics Letters*, Vol. 7, No. 2, pp. 183-187.

Griner, E. and L. Gordon, (1995), 'Internal Cash Flow, Insider Ownership, and Capital expendituress: A Test of the Pecking Order and Managerial Hypothesis', *Journal of Business Finance & Accounting*, Vol. 22, No. 2, pp.179-199.

Hall, B. (1993), 'The Stock Market's Valuation of R&D Investment During the 1980's', *American Economic Review*, Vol. 83, No. 2, pp. 259-264.

Handjinicolaou, G. and A. Kalay, (1984), 'Wealth Redistributions or Changes in Firm Value: An Analysis of Returns to Bondholders and Stockholders around Dividend announcements', *Journal of Financial Economics*, Vol. 13, No. 1, pp. 35-63.

Hand, R. and W. Landsman, (2005), 'The Pricing of Dividends in Equity Valuation', *Journal of Business finance & Accounting*, Vol. 32, No. 3, pp. 435-469.

Harris, T., M. Lang and H. Möller, (1994), 'The Value Relevance of German Accounting Measures: An Empirical Analysis', *Journal of Accounting Research*, Vol. 32, No. 2, pp. 187-209.

Hayes, R. and W. Abernathy, (1980), 'Managing Our Way to Economic Decline', *Harvard Business Review*, Vol. 58, No. 4, pp. 67-77.

Hayn, C. (1995), 'The Information Content of Losses', *Journal of Accounting and Economics*, Vol. 20, No. 2, pp. 125-153.

Hess, A. and P. Frost, (1982), 'Tests for Price Effects of New Issues of Seasoned Securities', *Journal of Finance*, Vol. 37, No. 1, pp. 11-25.

Hirschey, M. (1982), 'Intangible Capital Aspects of Advertising and R & D Expenditures', *Journal of Industrial Economics*, Vol. 30, No. 4, pp. 375-390.

Hirschey, M. (1985), 'Market Structure and Market Value', *Journal of Business*, Vol. 58, No. 1, pp. 89-98.

Hirschey, M. and R. Spencer, (1992), 'Size Effects in the Market Valuation of Fundamental Factors', *Financial Analysts Journal*, Vol. 48, No. 2, pp. 91-95.

Holland, K. and L. Hodgkinson, (1994), 'The Pre-Announcement Share Price Behaviour of UK Takeover Targets', *Journal of Business Finance & Accounting*, Vol. 21, No. 4, pp. 467-490.

Holthausen, R. and R. Watts, (2001), 'The Relevance of the Value-Relevance Literature for Financial Accounting Standard Setting', *Journal of Accounting and Economics*, Vol. 31, No. (1-3), pp. 3-75.

Howell, S. (1995), 'Forecasting', cited in: *Issues in Management Accounting*, edited by: Ashton, Hopper and Scapens, 2nd Edition, Prentice Hall, London, Chapter 13, pp. 256-293.

John, K. and B. Mishra, (1990), 'Information Content of Insider Trading around Corporate Announcements: The Case of Capital expendituress', *The Journal of Finance*, Vol. 45, No. 3, pp. 835-855.

Jones, E. (2000), 'Company Investment Announcements and the Market Value of the Firm', Working Paper, Department of Accounting and Finance, Heriot-Watt University, Edinburgh.

Jose, M., L. Nichols and J. Stevens, (1986), 'Contributions of Diversification, Promotion, and R & D to the Value of Multi-product Firms: A Tobin's Q Approach', *Financial Management*, Vol. 15, No. 4, pp. 33-42.

Kalay, A. and A. Shimrat, (1987), 'Firm Value and Seasoned Equity Issues: Price Pressure, Wealth Redistribution or Negative Information', *Journal of Financial Economics*, Vol. 19, No. 1, pp. 109-126.

Kalay, A. and U. Lowenstein, (1985), 'Predictable Events and Excess Returns: The Case of Dividend Announcement', *Journal of Financial Economics*, Vol. 14, No. 3, pp. 423-449.

Kalra, R., G. Henderson and M. Walker, (1994), 'Share Price Reaction to Plant-Closing Announcements', *Journal of Economics and Business*, Vol. 46, No. 5, pp. 381-395.

Kerstein, J. and S. Kim, (1995), 'The Incremental Information Content of Capital expendituress', *The Accounting Review*, Vol. 70, No. 3, pp. 513-526.

Kim, S. (2001), 'The Near-Term Financial Performance of Capital expendituress: A Managerial Perspective', *Managerial Finance*, Vol. 27, No. 8, pp. 48-62.

Kim, W., E. Lyn, T. Park and E. Zychowicz, (2005), 'The Wealth Effects of Capital Investment Decisions: An Empirical Comparison of Korean *Chaebol* and Non-*Chaebol* Firms', *Journal of Business Finance & Accounting*, Vol. 32, No. (5&6), pp. 945-971.

Kothari, S. and J. Zimmerman, (1995), 'Price and Return Models', *Journal of Accounting and Economics*, Vol. 20, No. 2, pp. 155-192.

Kothari, S. (2001), 'Capital Markets Research in Accounting', Working Paper, Massachusetts Institute of Technology.

Kothari, S., T. Laguerre and A. Leone, (2002), 'Capitalisation versus Expensing: Evidence on the Uncertainty of Future Earnings from Current Investments in PP&E versus R&D', *Review of Accounting Studies*, Vol. 7, No. 4, pp. 355-382.

Koutsoyiannis, A. (1984), '*Modern Microeconomics*', 2nd Edition, Macmillan, London.

Kraus, A. and H. Stoll, (1972), 'Price Impacts of Blocks Trading on the New York Stock Exchange', *Journal of Finance*, Vol. 27, No. 3, pp. 569-588.

Lamont, O. (2000), 'Investment Plans and Stock Returns', *The Journal of Finance*, Vol. 55, No. 6, pp. 2719-2745.

Lee, C. (1999), 'Accounting-Based Valuation: Impact on Business Practices and Research', *Accounting Horizons*, Vol. 13, No. 4, pp. 413-425.

Leland, H. and D. Pyle, (1977), 'Information Asymmetries, Financial Structure, and Financial Intermediation', *Journal of Finance*, Vol. 32, No. 2, pp. 371-387.

Lev, B. (1989), 'On the Usefulness of Earnings and Earnings Research: Lessons and Directions from Two Decades of Empirical Research', *Journal of Accounting Research*, Vol. 27, Supplement, pp. 153-201.

Lev, B. and P. Zarowin, (1999), 'The Boundaries of Financial Reporting and How to Extend Them', *Journal of Accounting Research*, Vol. 37, No. 2, pp. 353-385.

Lev, B. and R. Thiagarajan, (1993), 'Fundamental Information Analysis', *Journal of Accounting Research*, Vol. 31, No. 2, pp. 190-215.

Lintner, J. (1956), 'Distribution of Incomes of Corporations among Dividends, Retained Earnings, and Taxes ', *American Economic Review*, Vol. 46, No. 2, pp. 97-113.

Lipe, R. (1986), 'The Information Contained in the Components of Earnings', *Journal of Accounting Research*, Vol. 24, Supplement, pp. 37-64.

Lipe, R. (1990), 'The Relation between Stock Returns and Accounting Earnings Given Alternative Information', *The Accounting Review*, Vol. 65, No. 1, pp. 49-71.

Livnat J. and P. Zarowin, (1990), 'The Incremental Information Content of Cash-Flow Components', *Journal of Accounting and Economics*, Vol. 13, No. 1, pp. 25-46.

Lonie, A., G. Abeyratna, D. Power and C. Sinclair, (1996), 'The Stock Reaction to Dividend Announcements: A UK Study of Complex Market Signals', *Journal of Economic Studies*, Vol. 23, No. 1, pp. 32-52.

Lustgarten, S. (1982), 'The Impact of Replacement Cost Disclosures on Security Prices: New Evidence', *Journal of Accounting and Economics*, Vol. 4, No. 2, pp. 121-141.

Marris, R. (1963), 'A Model of the Managerial Enterprise', *The Quarterly Journal of Economics*, Vol. 77, No. 2, pp. 185-209.

Marsh, P. (1979), 'Equity Rights Issues and the Efficiency of the UK Stock Market', *Journal of Finance*, Vol. 34, No. 4, pp. 839-862.

Masulis, R. and A. Korwar, (1986), 'Seasoned Equity Offerings: An Empirical Investigation', *Journal of Financial Economics*, Vol. 15, No. (1&2), pp. 91-118.

Masulis, R. (1980a), 'Stock Repurchases by Tender Offers: An Analysis of the Cause of Common Stock Price Changes', *Journal of Finance*, Vol. 35, No. 2, pp. 305-319.

McConnell, J. and C. Muscarella, (1985), 'Corporate Capital expenditures Decisions and the Market Value of the Firm', *Journal of Financial Economics*, Vol. 14, No. 3, pp. 339-422.

Miller, M. and F. Modigliani, (1961), 'Dividend Policy, Growth and the Valuation of Shares', *Journal of Business*, Vol. 34, No. 4, pp. 411-433.

Miller, M. and F. Modigliani, (1966), 'Some Estimates of the Cost of Capital to the Electric Utility Industry', *American Economic Review*, Vol. 56, No. 3, pp. 334-391.

Miller, M. and K. Rock, (1985), 'Dividend Policy under Asymmetric Information', *Journal of Finance*, Vol. 40, No. 4, pp. 1031-1051.

Mintzberg, H. (1978), 'Patterns in Strategy Formulation', *Management Science*, Vol. 24, No. 9, pp. 934-948.

Mintzberg, H. and J. Waters, (1985), 'Of Strategies, Deliberate and Emergent', *Strategic Management Journal*, Vol. 6, No. 3, pp. 257-272.

Modigliani, F. and M. Miller, (1958), 'The Cost of Capital, Corporation Finance, and the Theory of Investment', *American Economic Review*, Vol. 48, No. 3, pp. 261-297.

Morck, R., A. Shleifer and R. Vishny, (1989), 'Alternative Mechanisms for Corporate Control', *American Economic Review*, Vol. 79, No. 4, pp. 842-852.

Myers, S. and N. Majluf, (1984), 'Corporate Financing and Investment Decisions When Firms Have Information that Investors do not Have', *Journal of Financial Economics*, Vol. 13, No. 2, pp. 187-221.

Nwaeza, E. (1998), 'Regulation and the Valuation Relevance of Book Value and Earnings: Evidence from the United States', *Contemporary Accounting Research*, Vol. 15, No. 4, pp. 547-573.

Ohlson, J. (1989), 'Earnings, Book Values and Dividends in Equity Valuation: An Empirical Perspective', Working Paper, New York University.

Ohlson, J. (1995), 'Earnings, Book Values and Dividends in Equity Valuation', *Contemporary Accounting Research*, Vol. 11, No. 2, pp. 661-687.

Ou, J. and S. Penman, (1989a), 'Financial Statement Analysis and the Prediction of Stock Returns', *Journal of Accounting and Economics*, Vol. 11, No. 4, pp. 295-329.

Ou, J. and S. Penman, (1989b), 'Accounting Measurement, Price-Earnings Ratios, and the Information Content of Security Prices', *Journal of Accounting Research*, 27, Supplement, pp. 111-144.

Pakes, A. (1985), 'On Patents, R & D, and the Stock Market Rate of Return', *Journal of Political Economy*, Vol. 93, No. 2, pp. 390-409.

Patell, J. (1976), 'Corporate Forecasts of Earnings per Share and Stock Price Behaviour: Empirical Tests', *Journal of Accounting Research*, Vol. 14, No. 2, pp. 246-276.

Penman, S. (1992), 'Returns to Fundamentals', *Journal of Accounting, Auditing and Finance*, Vol. 7, No. 4, pp. 465-483.

Peterson, P. and G. Benesh, (1983), 'A Re-Examination of the Empirical Relationship between Investment and Financing Decisions', *Journal of Financial and Quantitative Analysis*, Vol. 18, No. 4, pp. 439-453.

Pettit, R. (1972), 'Dividend Announcements, Security Performance and Capital Market Efficiency', *Journal of Finance*, Vol. 27, No. 5, pp. 993-1007.

Pettit, R. (1976), 'The Impact of Dividend and Earnings Announcements: A Reconciliation', *Journal of Business*, Vol. 49, No. 1, pp. 86-96.

Porter, M. (1980), '*Competitive Strategy: Techniques for Analysing Industries and Competitors*', Free Press, New York.

Rappaport, A. (1986), '*Creating Shareholder Value: the New Standard for Business Performance*', Free Press, New York.

Rauh, T. (1990), 'Accounting: Early Warning Systems for Troubled Retailers', *Commercial Lending Review*, Vol. 5, No. 1, pp. 59-69.

Rees, W. (1997), 'The Impact of Dividends, Debt and Investment on Valuation Models', *Journal of Business Finance & Accounting*, Vol. 24, No. (7&8), pp. 1111-1140.

Roll, R. (1983), 'On Computing Mean Returns and the Small Firm Premium', *Journal of Financial Economics*, Vol. 12, No. 3, pp. 371-386.

Ross, S. (1977), 'The Determination of Financial Structure: The Incentive Signalling Approach', *The Bell Journal of Economics*, Vol. 8, No. 1, pp. 23-40.

Sant, R. and S. Ferris, (1994), 'Seasoned Equity Offerings: The Case of All-Equity Firms', *Journal of Business Finance & Accounting*, Vol. 21, No. 3, pp. 429-444.

Scholes, M. (1972), 'The Market for Securities: Substitution vs. Price Pressure and the Effects of Information on Share Prices', *Journal of Business*, Vol. 45, No. 2, 179-211.

Shapiro, A. (1985), 'Corporate Strategy and the Capital Budgeting Decision', *Midland Corporate Finance Journal*, Vol.3, No. 1, pp. 22-36.

Sougiannis, T. (1994), 'The Accounting Based Valuation of Corporate R&D', *Accounting Review*, Vol. 69, No. 1, pp. 44-68.

Stark, A. (1997), 'Linear Information Dynamics, Dividend Irrelevance, Corporate Valuation and Clean Surplus Relationship', *Accounting and Business Research*, Vol. 27, No. 3, pp. 219-228.

Stark, A. and H. Thomas, (1998), 'On the Empirical Relationship between Market Value and Residual Income in the U.K.', *Management Accounting Research*, Vol. 9, No. 4, pp. 445-460.

Statman, M. and J. Sepe, (1989), 'Project Termination Announcements and the Market Value of the Firm', *Financial Management*, Vol. 14, No. 4, pp.74-81.

Stewart, D. and D. Furse, (1984), 'Analysis of the Impact of Executional Factors on Advertising Performance', *Journal of Advertising Research*, Vol. 24, No. 6, pp. 23-26.

Strong N. (1992), 'Modelling Abnormal Returns: A Review Article', *Journal of Business Finance & Accounting*, Vol. 19, No. 4, pp. 533-553.

Strong, N. (1997), 'Discussion of the Impact of Dividends, Debt, and Investment on Valuation Models', *Journal of Business Finance & Accounting*, Vol. 24, No. (7&8), pp. 1141-1145.

Strong, N. and M. Walker, (1993), 'The Explanatory Power of Earnings for Stock Returns', *The Accounting Review*, Vol. 68, No. 2, pp. 385-399.

Szewczyk, S., G. Tsetsekos and Z. Zantout, (1996), 'The Valuation of Corporate R&D Expenditures: Evidence from Investment Opportunities and Free Cash Flow', *Financial Management*, Vol. 25, No. 1, pp. 105-110.

Thomas, R. (1997), '*Modern Econometrics: An Introduction*', Edinburgh: England, Addison Wesley Longman.

Trueman, B. (1986), 'The Relationship between the Level of Capital expendituress and Firm Value', *The Journal of Financial and Quantitative Analysis*, Vol. 21, No. 2, pp. 115-129.

Vogt, S. (1997), 'Cash Flow and Capital Spending: Evidence from Capital expenditures Announcements', *Financial Management*, Vol. 26, No. 2, pp. 44-57.

Watts, R. (1973), 'The Information Content of Dividends', *Journal of Business*, Vol. 46, No. 2, pp. 191-211.

White, H. (1980), 'A Heteroskedasticity–Consistent Covariance Matrix Estimator and a Direct Test for Heteroskedasticity', *Econometrica*, Vol. 48, No. 4, pp. 817-838.

Wilson, G. (1986), 'The Relative Information Content of the Accruals and Cash Flows: Combined Evidence at the Earnings Announcement and Annual Report Release Date', *Journal of Accounting Research*, Vol. 24, Supplement, pp. 165-200.

Wilson, G. (1987), 'The Incremental Information Content of the Accrual and Funds Components of Earnings after Controlling for Earnings', *The Accounting Review*, Vol. 62, No. 2, pp. 293-322.

Woolridge, J. (1988), 'Competitive Decline and Corporate Restructuring: Is a Myopic Stock Market to Blame?' *Journal of Applied Corporate Finance*, Vol. 1, No. 1, pp. 26-36.

Woolridge, J. and C. Snow, (1990), 'Stock Market Reaction to Strategic Investment Decisions', *Strategic Management Journal*, Vol. 11, No. 5, pp. 353-363.

Woolridge, R. (1983), 'Dividend Changes and Security Prices', *Journal of Finance*, Vol. 38, No. 5, pp. 1607-1615.

Young, S. and D. Oswald, (2004), 'Open Market Share Reaquisitions, Surplus Cash, and Agency Problems', Working Paper, Management School, Lancaster University.

Zantout, Z. and G. Tsetsekos, (1994), 'The Wealth Effects of Announcements of R&D Expenditure Increases', *Journal of Financial Research*, Vol. 17, No. 2, pp. 205-216.