THE PROFITABILITY AND CONSISTENCY OF THE ACCOUNTING ABNORMAL ACCRUALS ANOMALY IN UK FIRMS

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Submitted in Partial Fulfilment of the Requirements of the Degree of Doctor of Philosophy, March 2009

TABLE OF CONTENTS

CHAPTER SIX: RESULTS- THE PROFITABILITY AND CONSISTENCY OF THE ABNOMAL ACCRUALS ANOMALY

CHAPTER SEVEN: RESULTS- RISK ANALYSIS OF THE ABNORMAL ACCRUALS ANOMALY

LIST OF TABLES

CHAPTER SEVEN

LIST OF FIGURES

ACKNOWLEDGEMENTS

I would like to express my sincere thanks and appreciation to the following people who have given me the support and inspiration to complete this thesis:

My supervisor, Professor Glen Arnold, for the genuine guidance, invaluable support and constant encouragement, throughout the years of this research. They usually say, for each person there are five minutes fame, and I do believe that I had mine when I started working with him.

Professor Rose Baker for her assistance, astute suggestions, helpful comments and inspiration in the course of my study.

Dr. Jasim Al-Ali, Dr. John Davenport, Dr. Stanley Mutenga, Mr. Roger Adkins, Dr. Jia Liu, and Professor Roger Lister, for the invaluable effort, sage advice, imaginative comments and important pointers they made to enrich this research.

Salford Business School at the University of Salford for providing me with the opportunity, required facilities, and research environment. A very special thanks to our research manager, Ms Susan Sharples, for her distinguished managing ability.

My friends and colleagues for their insights, opinions, support and inspiration, which were of great value for my research and for myself.

My wife, Suad Dafer, for her remarkable love, understanding, and support. Lots of thanks to her and to my daughters Nour, Ayiah, and Farah for all the unforgettable and memorable moments, days, weeks, months, and years we spent together, in the UK, in order to achieve this work. I love you all.

My brother, Nidal Ahmad, for his love, encouragement, and generous funding. Without his support, this research would not have been possible.

My family --- my parents, my sisters and brothers, who gave me the love, support, care and encouragement throughout the entire journey of this research, that I managed to conquer all difficulties and life challenges.

Finally and more importantly, my everlasting grateful to Almighty God who has given me the guidance, confidence, ability and care throughout the entire period of this study.

ABBREVIATIONS

A	Total Assets
AIM	Alternative Investment Market
AMEX	American Stock Exchange
B/M	Book-to-Market Ratio
BE	Book Equity
BHAR	Buy-and-Hold Abnormal Returns
CA	Current Assets
CAPM	Capital Assets Pricing Model
CAR	Cumulative Abnormal Returns
CEO	Chief Executive Officer
CF	Cash Flow
CL	Current Liabilities
CRSP	Centre for Research in Security Price
DA	Discretionary Accruals
Dep	Depreciation
E	Earnings
EMH	Efficient Market Hypothesis
EPS	Earnings Per Share
FASB	Financial Accounting Standard Board
FF	Fama and French
FIFO	First in First out
IPO	Initial Public Offering
ITC	International Trade Commission
LIFO	Last in First out
LSE	London Stock Exchange
LSPD	London Share Price Data
MBO	Management Buyout
MJM	Modified Jones Model
NA	Non-Discretionary Accruals
NASDAQ	National Association of Securities Dealers Automated Quotation
NPV	Net Present Value
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
OTC	Over The Counter
PPE	Property, Plant and Equipment
REC	Receivables
REV	Revenues
S/B/M	Size-and-Book-to-Market Ratio
SEC	Security Exchange Commission
SFAC	Statement of Financial Accounting Concepts
STD	Short-Term Debt
TA	Total Accruals
USM	Unlisted Securities Market

ABSTRACT

This research explores new evidence on the profitability, consistency and potential explanations of the accruals anomaly. We extend prior research into the association between earnings and share price by discriminating between firms on the basis of the abnormal accruals contained in the reported operating profits. We investigate the accounting abnormal accruals enigma using U.K company data for the period 1968-2005 to see whether companies reporting incomes consisting of the highest [lowest] operating abnormal accruals as a proportion of total assets significantly earn lower [higher] returns than the generality of the companies. We define a firm's abnormal accrual as the difference between its actual and normal total accruals. Total accruals are calculated as the change in non-cash working capital before income taxes payable less total depreciation expense. The themes of this thesis are two-fold.

First, the time-series version of the Modified Jones Model is employed to decompose total operating accruals as they appear on the sample companies' financial statements into normal and abnormal accruals.

Second, an empirical examination of the profitability and consistency of the abnormal accruals anomaly is undertaken. Abnormal returns for abnormal accruals deciles are estimated using a range of tests: the market-, the size-, the book-to-market- and the size-and-book-to-market-adjusting tests.

Our abnormal returns estimates for the abnormal accruals deciles show evidence that the abnormal accruals anomaly in the UK is driven particularly by the highest abnormal accruals firms with significant negative abnormal returns over three years of about 4-5% per annum. Potential risk explanations for the observed accruals anomaly based on variety of tests including the use of the Fama and French three factor model are provided. The findings indicate that the abnormal accruals anomaly is robust after controlling for the risk factors. Therefore, the implication of this study is to short sell those shares in the highest abnormal accruals decile or, alternatively, to avoid buying them.

CHAPTER ONE

INTRODUCTION

1.1 Context, Motivation and Contribution

The accounting profession emphasizes that the main objective of financial reporting is to provide information about firms' historical, present, and future performance.

Contrary to cash basis accounting, standard setters, through the implementation of accrual basis accounting, offer a range of flexibilities to managers of enterprises regarding the way they report their economic transactions even when these transactions do not include receipts or payments of cash. This freedom regarding the reporting of financial data is usually required to facilitate the communication of value-relevant information to interested parties, and therefore increase the benefits from the financial reporting system.

Accrual based accounting, as defined by Kieso and Weygandt (1998), is the process of using accrual, deferral, and allocation procedures with the goal of relating revenues, expenses, gains, and losses to periods to reflect an entity's performance during a period instead of merely listing its cash receipts and outlays. Moreover, Dechow (1994) clarifies that accrual accounting, through using accounting principles such as revenue recognition and matching, aims to enable investors to evaluate the economic performance during a period and provide a better estimation of earnings performance than cash flows.

Houge and Loughran (2000) and Lakonishok et al (1994), emphasise the relative importance of the cash flow and the accruals components of income to determine accurately the quality of earnings in a company. Bernard and Skinner (1996) and Bernard and Stober (1989) stress that in their work, the information content of accruals is the same as of cash flows.

However, many other researchers believe that the accrual component of income (and consequently the income itself), as a measure of performance, is of higher risk than cash flow, since accruals noisily signal the future performance of an enterprise, e.g., Xie (2001), and Sloan (1996). Furthermore, in an earnings management context Healy and Wahlen (1999) and Holland and Ramsay (2003) highlight the tendency of managers to use judgement in financial reporting to mislead users of their accounts or to influence contractual outcomes.

With regard to share prices (i.e., wealth of owners' equity) many empirical studies have documented a positive association between earnings (as hypothesized of being able to summarize economic value information) and stock returns. Early examples are Ball and Brown (1968), Beaver (1968) and Beaver et al. (1979).

Managers and accountants may be expected to exercise more discretion (e.g., adopting income-increasing accounting options) as they disclose their companies' income figures if they believe that investors are likely to be fooled by the implications of their practices because they fixate on the last line of income statements.

Many studies have been published showing different reasons for managers to exercise discretion in their accounts, e.g., Cheng and Warfield (2005) report that managers adopt income-increasing practices to increase the market price of their share holding and share compensations. Bauman and Shaw (2006) clarify that managers with a high proportion of stock option remuneration in their compensation plans have higher incentives to meet or exceed analysts' forecasts. Gramlich and Sørensen (2004) show that managers of Danish initial public offerings (IPO) firms manage their earnings to reach their voluntarily published forecast targets. Similar findings are obtained by Cormier and Martinez (2006) for French IPO firms and by Jaggi et al. (2006) for Taiwanese IPO firms.

Existing share owners, as well as external users (e.g. potential share investors), make use of information contained in reported accounting earnings to evaluate their holdings in different companies, even if reported figures are to be communicated reflecting substantial variances from their normal values (i.e., expected values in the absence of earnings management).

Further research has been focused on exploring systematic relationships between current and future components of earnings to know which component of current income is of higher persistence in generating future incomes as well as on the significance of relationships between current components of income and current returns, e.g., Wilson (1987, 1986), Subramanyam (1996), and Krishnan (2003).

A pioneering study by Sloan (1996) proposes that investors commit cognitive errors as they price current components of income; failing to consider the transitory nature of accruals and the long run persistence of cash flows. Thus, an accruals hedge portfolio can capture the market mispricing (anomaly) of components of income due to investors fixating (anchoring) on earnings, neglecting the information content in the components of earnings. Similar findings are reported by Collins and Hribar (2000). Richardson et al. (2005) show empirically that less reliable accruals lead to lower earnings persistence leading to significant share mispricing as investors fail to fully anticipate the lower earnings persistence[1]. Moreover, Pincus et al. (2007) report that the accrual anomaly documented by Sloan (1996) is present in the international evidence[2].

[1] Based on definition by the Financial Accounting Standard Board's (FASB) Statement of Financial Accounting Concepts (SFAC) reliability is defined in their paper as "*the quality of information that assures that information is reasonably free from error and bias and faithfully represents what it purports to represent*", Richardson et al. (2005, p 440).

[2] Pincus et al. (2007) test the accruals anomaly documented by Sloan considering stock markets in 20 countries, these include: Australia, Canada, Denmark, France, Germany, Hong Kong, India, Indonesia, Italy, Japan, Malaysia, The Netherlands, Singapore, Spain, Sweden, Switzerland, Taiwan, Thailand, the United Kingdom, and the United States. Their source of data is the Global Vantage Industrial/Commercial (GVIC) and Global Vantage Issues (GVI) files over the period (1994-2002). As in Sloan (1996), the researchers employ the Mishkin's (1983) test to see if accruals are mispriced. They find that the market attributes a statistically higher weight to accruals than implied by the efficient market hypothesis for Australia, Canada, the UK, and the US. The researchers state that "*we confirm that the anomaly is more likely to occur where a common law legal tradition exists, and also where more extensive use of accrual accounting is permitted, where there is a lower the concentration of share ownership*" (p. 171). Note: the Mishkin's (1983) test is emphasised in section 2.6 of chapter two.

In the same context, Mashruwala et al. (2006) clarify that Sloan's accrual anomaly is not arbitraged away because it is concentrated in firms with high stock return volatility, which are unattractive for risk-averse arbitragers.

More advanced and sophisticated research regarding the same issue has taken place. That research usually decomposes total accruals into two minor components: the normal and abnormal accruals, and then, investigates the information content and pricing of these components. Subramanyam (1996) provides evidence that the abnormal accrual component of income has information content above and beyond other income components, and therefore should be priced by the market.

Xie (2001) investigates the rationality with which the market prices the abnormal accrual component of earnings. He concludes that the market overprices abnormal accruals but does not materially misprice normal accruals.

As a matter of fact, the results of Sloan (1996) and Xie (2001), which identify a simple relation between abnormal earnings and abnormal returns, if true in the sense that this represents the prevailing situation in stock exchanges, strikes at the heart of the Efficient Market Hypothesis (EMH) stated by Fama (1970). The EMH implies that if the market is informationally efficient on the semi-strong form level then its participants, including arbitragers, will be able to receive, analyse, and fairly determine the effects of any new publicly available price-relevant information such as that contained in announcements of earnings in an unbiased manner. Therefore, making sustainable abnormal returns is impossible, since all the information contained in such news will have already been incorporated in current prices as soon as it appears. (An excellent discussion on the efficient market hypothesis is presented by Arnold (2008)).

However, despite the efforts made by researchers in trying to establish the factors that contribute to the abnormal accruals profitability, we are still far from reaching a consensus on the underlying nature and causes of the abnormal accruals anomaly.

In general, empirical evidence on earnings management using UK firm data is very limited. Charitou and Panagiotides (1999) employ UK data over the period (1991-95) to explore if current stock prices reflect one year-ahead (i.e., next year) earnings and cash flows. Their finding is that future earnings and cash flows are not fully impounded in stock prices[3].

Therefore, this study is an attempt to explore the profitability and consistency of the accounting abnormal accruals component of earnings.

We identify a significant relation between the sign and magnitude of the abnormal accruals and the sign and magnitude of share return residuals (i.e., abnormal returns) employing all the non-financial UK listed companies with available accounting data starting from the year 1968.

1.2 Overview of the Empirical Work

The empirical work performed by this study can be divided into three parts. In the first, an abnormal accrual-based model for decomposing the total accruals of earnings into normal and abnormal components is adopted. The model used [the *Modified Jones* suggested by Dechow et al. (1995)] measures abnormal accruals for the sample firms as the difference between normal accruals which will initially be estimated (as a proxy for *normal* total accruals) and *actual* total accruals.

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3 This line of research has been documented mainly by US studies, such as: 'The pricing of discretionary accruals', Subramanyam (1996). 'The Mispricing of Abnormal Accruals', Xie (2001). 'The Reversal of Abnormal Accruals and the Market Valuation of Earnings Surprises', DeFond, and Park (2001). 'Insider Trading, Earnings Quality, and Accrual Mispricing', Beneish, and Vargus (2002). 'Audit Quality and the Pricing of Discretionary Accruals', Krishnan (2003). And 'Credibility of Management Forecasts', Rogers, and Stocken (2005). There is also, a study from Netherlands 'Earnings management and abnormal returns Evidence from the 1970-1972 Price Control Regulations', Bowman, and Navissi (2003). And another from China 'Market Consequences of Earnings Management in Response to Security Regulations in China', Haw et al. (2005).

The main sample in this study includes all the companies listed on the London Stock Exchange (LSE) and those quoted on the Alternative Investment Market (AIM) for the period Jan 1968 to June 2005. A firm is required to have at least 12 years of accounting data to be included in the sample. This accounting data is used to estimate the normal and then the abnormal accruals parts of the sample firms' operating reported earnings.

Abnormal accruals are estimated for firms categorized into four main samples (A, B, C, and D) based on the quarter of the year during which the firms publish their accounts. Each sample is examined separately with the tests being the same for the four samples. The reason for creating four minor samples including firms with different financial year ends instead of testing one sample is to evaluate the effect of the accounting data on the share price as soon as possible after the financial year-end. The samples (A, B, C, and D) include all the firms with available accounting data that publish their accounts within the first quarter, fourth quarter, first half, and second half of any of the years (1979-2001), respectively.

Once the abnormal accruals estimates for sample companies have been identified, ten sample deciles are formed annually at each of the formation dates on the basis of the magnitude of these estimates. Decile portfolio number one includes all firms with the lowest 10 per cent of abnormal accruals estimates, abnormal accruals decile number ten includes all the firms with the highest 10 per cent of abnormal accruals estimates.

For each sample, abnormal accruals decile portfolios are formed six months as from the end of the financial quarter to ensure that the firms' accounting data is publicly available. Each sample is tested using 23 abnormal accruals portfolio formation dates. Consequently, this study accounts for 92 formation dates for the four samples including 920 abnormal accruals deciles.

The second part presents the process of abnormal return estimation for the abnormal accruals deciles.

This study compares the abnormal returns, if any, for decile portfolios formed on the basis of the magnitude of abnormal accruals. The estimated abnormal returns are presented averaged over 23 test periods as from the first test period: (for sample A [Oct 1, 1979 to Sep 30, 1982], for samples B and D [Jul 1, 1980 to Jun 30, 1983], for sample C [Jan 1, 1980 to Dec 31, 1982]), and ending by the last test period: (for sample A [Oct 1, 2001 to Sep 30, 2004], for samples B and D [Jul 1, 2002 to Jun 30, 2005], and for sample C [Jan 1, 2002 to Dec 31, 2004]).

Abnormal returns for the different abnormal accruals deciles are examined as follows. Abnormal accruals deciles' buy-and-hold raw returns are adjusted by a suitable portfolio benchmark buy-and-hold raw returns. The benchmark returns can take any form of: (1) returns on the market-index, (2) returns on size-control portfolios, (3) returns on book-to-market-control portfolios, and finally, (4) returns on size-and-book-to-market-control portfolios.

The third part investigates various related risk factors through conducting a comprehensive risk analysis for the abnormal accruals deciles including: (i) the use of standard deviation, (ii) year by year reliability, (iii) liquidation rates, (iv) the use of capital asset pricing model (CAPM), and (v) the use of Fama and French's (1993) three factor model.

Results of the estimated abnormal returns for the different abnormal accruals deciles in the four samples A, B, C, and D are reported averaged over the 23 test periods in each sample for five periods when using the benchmark approach. These periods are: the first 12, second 12, third 12, first 24 and first 36 months as from portfolio formation dates. On the other hand, results of the estimated abnormal returns using the CAPM and the Fama and French three factor model are presented for three distinct periods: the first, second, and third 12 months as from portfolio formation.

Finally, we also report results of the estimated abnormal returns for the two sample combinations [A+B] and [C+D], representing the abnormal accruals deciles' estimated adjusted returns for the two quarterly samples [(A) and (B)] together, and the two half year samples [(C) and (D)] together. Adjusted returns for the sample combinations (A+B), and (C+D) are obtained by averaging 46 annually adjusted returns for each of them.

1.3 Structure of this Research:

Chapter 2 reviews the accruals literature and its related consequences on share prices. This chapter is split into six parts, starting with brief review of the efficient market hypothesis and its related implications. The literature of two important financial anomalies: the size effect and the value-glamour book-to-market anomaly are also reviewed because these are factors that need to be allowed for in the subsequent analysis. The third part considers objectives of financial reporting, accruals as opposed to cash based accounting. Then, the relationship between accounting earnings and stock returns is investigated in the fourth part. The nature and amount of information content in earnings, accruals and cash flows are explored in the fifth part. We finish this chapter by emphasising the role of normal and abnormal accruals within the context of earnings management.

Chapter 3 focuses on specification of the earnings management model which is employed in this study to decompose total operating accruals as a part of operating income into normal and abnormal parts. We start this chapter by addressing the general accounting accrual-based tests' design. Four well-known earnings management models are reviewed: the Healy model (1985), the DeAngelo model (1986), the Jones model (1991), and the Modified Jones model

(MJM) (1995) which is employed by this research. We empirically justify the reason we chose to employ the MJM. The main areas of variation between researchers regarding the way they employ the MJM are also detailed. Finally, the possibility that the estimated abnormal accruals figures being misleading is explored.

Chapter 4 describes in detail the methodological issues related to the data employed, the sample selection, the creation of four minor samples (A, B, C, and D), and the creation of four sample related market indices. Defining the variables and specifications of the employed MJM is also of central importance.

Chapter 5 continues discussing the methodology of the research design. Methods of estimation of abnormal returns for sample portfolios formed on the basis of abnormal accruals are considered. Four main methods are used in this study to adjust returns of the abnormal accruals portfolios: (i) returns on the market indices, (ii) returns on size-control portfolios, (iii) returns on book-to-market control portfolios, and (iv) returns on size-and-book-to-market control portfolios. A fairly complicated methodology has been explained in this chapter in relation to the method used to calculate portfolio returns giving a weight to each share in the portfolio determined by its monthly relative market capitalisation. The CAPM and the Fama and French three factor models, widely used capital asset pricing models, are also discussed in this chapter. Finally, the buy-and-hold returns and cumulative returns are contrasted and critically assessed.

Chapter 6 reports the empirical evidence of the abnormal accruals profitability in UK shares. In addition, the consistency of the abnormal accruals anomaly is investigated for all of the four samples A, B, C, and D and the combination samples A+B together and C+D together.

Chapter 7 reports results of the estimated coefficients on the explanatory variables in both of the CAPM and the Fama and French three factor models. Arguably, regressors of these two models derive the level of share portfolio returns as they are believed to represent risk-factors. Therefore, if the abnormal accruals anomaly is robust, its profitability should not be explained by the models.

Finally, chapter 8 contains the conclusions drawn from this research with the main findings, discussion of the main contributions and suggestions for future research.

CHAPTER TWO

LITERATURE REVIEW "ONE"

2.1 Introduction

In this chapter of this study, we review the literature within the area of the efficient market hypothesis and related implications. Firm size effect and book-to-market equity phenomenon are explored. We address objectives of financial reporting, and accrual versus cash basis accounting. Abnormal as well as normal accruals are also of central importance. We finish this chapter by reviewing some typical earnings management studies including those of the UK, and emphasising the evidence on the role of auditing in constraining earnings management.

2.2 The Efficient Market Hypothesis (EMH)

According to Fama (1970) financial markets are described as informationally efficient if security prices rationally and fully reflect all available information. Consequently, the EMH implies that if new information is revealed about a firm, it will be incorporated into the share price rapidly and rationally with respect to the direction and size of the share price movement. In the same context, Howells & Bain (1998) emphasis that the EMH does not require share prices to be always correct in favour of the expectations that people form in the prevailing situation are the best possible forecasts. They also add that if price forecasting is optimal, and the EMH holds, then it must be the case that the price forecast errors has a mean value of zero and that they have zero covariance with the forecast.

2.2.1 Three Forms of Market Efficiency

According to Fama (1970) there are three levels at which the EMH can be said to hold:

The Weak Form Level of Market Efficiency:

This form of market efficiency states that all information contained in the past behaviour of the asset's price is included. Brealey and Myers (2003, p 351) indicate that the financial market is efficient at the weak form level if all the information in past prices are reflected in today's stock price. Patterns in prices will no longer exist and price changes in one period will be independent of changes in the next. In other words, the share price will follow a random walk, or at least a martingale.

The implication of the weak form is that studying and analysing past price movements is pointless, since all the information contained in these prices will have already been reflected in current prices. Due to the existence of few rational investors and some arbitragers abnormal returns are considered as the exception rather than the rule. Therefore, an investing policy of buy and hold can produce a return as high as a policy of trading using past price information, especially after controlling for the accompanied costs.

The Semi-Strong Form Level of Market Efficiency:

The semi-strong level of market efficiency means that all publicly available information is incorporated in the current price. The set of information required to be incorporated in current prices is more demanding than the first type. In addition to the past information, prices should also reflect current public announcements about issues such as dividends announcement, rights issue, technological breakthrough, resignations of directors.

This level of market efficiency implies that it is impossible for abnormal returns to continue based on studying and analysing current publicly available price relevant information, such as information contained in announcements about earnings, sales, new products, changes in capital structure. The market represented by its participants, will receive, analyse, and determine the exact effects concerning the direction and amount of any new value relevant information, in a way compatible with what is expected under the fair game model and the rational expectation theory with a mean value of zero for the error once the new information (news) is revealed and within seconds. Therefore, making sustainable abnormal returns is impossible, since all the information contained in this news will have already been reflected in current prices as soon as it appears. This means a strategy of buy and hold under specific conditions can produce returns equal to those from a strategy of trading using the publicly published information, mainly after considering any additional transaction costs.

The Strong Form Level of Efficiency:

Fama (1970) states that markets are efficient at the strong form level when all information (public and private) is absorbed into price. In that case, there is no point trying to trade on the basis of past information, or on the current publicly available or private information.

2.3 Firm Size Effect and Book-to-Market Equity Phenomenon

Two important anomalies are demonstrated in this section. The first relates to the firm size effect, and the second to the book-to-market ratio.

2.3.1 The Size Effect

Banz (1981) was the first to document the size effect. Using US data over a forty year period he documents that small firms have had significantly larger risk adjusted returns than large firms. The small firm effect is not linear in the market proportions rather it is particularly pronounced for the very small firms in the sample. Banz (1981) also makes clear that there is no theoretical foundation for the effect, and it is unknown whether the size effect is due to size factor or to some other factors that are correlated with size and omitted from the CAPM.

Analysing US data for the period 1963-1977, Reinganum (1981) finds evidence that smaller firms produce significantly higher returns than those of larger firms for periods extend to at least two years.

The evidence is also repeated in Chan and Chen (1991) who claim that there are important economic differences between small and large firms in terms of their risk-return characteristics. According to them, small firms on the New York Stock Exchange (NYSE) tend to be less operationally efficient (i.e., they are inefficient producers) compared with large firms. These companies, the small firms, are likely to have high leverage and face cash flow problems; therefore there is a high likelihood financial distress. Chan and Chen (1991) refer to such firms as marginal firms in the sense that their prices and continuity are highly exposed to economic conditions. In sum, they propose that size (a characteristic that signals the earnings prospect of firms) is associated with a risk factor in returns.

The researchers point out that while not all small firms are marginal firms (i.e., unhealthy firms), they are heavily populated by the marginal firms. Therefore, the evidence in Chan and Chen's (1991) indicates that over the period (1956-1985) small firms outperformed large firms because small firms are more likely to include firms of higher risk.

In a remarkable study, Fama and French (1992) support the observed evidence. Employing US data covering the period (1963-1990) they document an apparent and strong size effect. Small firms tend to outperform large firms (large firms earn an average return of 0.9 % per month) by 0.74% per month.

Although they do not completely eliminate the possibility of an irrational market, Fama and French (1992) tend to relate the observed negative relationship between the portfolios' average returns and the firm's size to a risk factor. They argue that size is a proxy for risk in the sense that smaller firms are more likely to be financially distressed.

From another dimension, Berk (1997) clarifies that there is no theoretical background to explain why small firms potentially achieve higher returns than large firms because none is needed if firm size is measured correctly. Employing US data Berk argues that the "so called" size-enigma is exclusively evident when size is defined as market value but not if it is defined by book value or the total value of the annual sales. Size measured by equity market value necessarily reflects the risks priced in equity returns, whatever their source. Berk's point of view is based on the intuition of how the market value originally is determined. His proposal is that so long as the market value of a firm is equal to the discounted value of its expected future cash flows, then all else kept equal, riskier cash flows require higher discount rates and so will have lower present prices (i.e., market values). Accordingly, it is within the modern financial theory that we can expect small companies to have higher returns in compensation for the higher risk. That is, the inverse relation between value and expected return is because riskier stocks command lower values in order to offer higher expected returns in an equilibrium state.

Berk's study can be summarised: that the documented size effect when size is defined as the market value can not be taken as evidence against the EMH.

Regarding UK research, Strong and Xu (1997) find evidence that over the period 1973-1992 average returns are significantly negatively related to market value. Also, a study by Miles and Timmermann (1996) documents that the size effect is substantially significant for the smallest decile in their sample period.

The size effect stability over time has also been questioned by many researchers. Brown et al. (1983) employ US data and find contradictory results for two sub-periods: (1967 -1975) and (1973 -1979). For the first sub-period they find insignificant positive size effect, while for the second sub-period they find significant negative size effect. They conclude that the evidence suggests the existence of the size effect but does not suggest its stability. In addition, Reinganum (1992) investigates the small firm effect to see whether the performance of small firms displays a cyclical behaviour with predictable pattern. The evidence is that the performance behaviour of small firms is not predicable for the time span covered by his study. Furthermore, he finds evidence that high market value portfolios outperform low market value portfolios in some time periods.

From a size-earnings perspective, Ball (1978) and Foster et al. (1984) stress that there is systematic negative relation between firm size and earnings. On the other hand, Burgstahler and Dichev (1997) and Holland and Ramsay (2003) noted a positive relation between earnings management and each of firm size and accruals.

2.3.2 The Book-to-Market Ratio Phenomenon

The documented book-to-market equity effect relates to the overall value-glamour (value minus glamour) phenomenon. The book-to-market strategy simply implies buying long those stocks with high ratios of book-to-market equity, hypothesised to be undervalued relative to their book values, and selling short those stocks with low ratios of book-to-market equity as they are hypothesised to be overvalued relative to their book values[1].

Rosenberg et al. (1985) argue that they find significant abnormal returns on a strategy of buying high book-to-market shares and selling those of low book-to-market ratio. They also add that their finding is a proof against the efficient market hypothesis.

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[1] It has traditionally been argued that investment strategies of buying stocks with low prices relative to measures of value such as book-to-market, earnings, divdends, etc. produce higher returns (Graham and Dodd (1934)). More recent research has been conducted within the context "the value-glamour investment strategies". Examples of such strategies are: *high book-to-market* (e.g., Bernard et al. 1997, Doukas et al. 2002, Cheng and Thomas 2006)/ *high operating cash flows-to-price* (e.g., Lakonishok et al. (1994))/ *low sales growth* (e.g., Lakonishok et al. (1994))/*and high earnings to price* (e.g., Basu 1977, La Porta 1996, Bernard et al. 1997) shares (and labelled value stocks) outperform *low book-to-market/ low operating cash flows-to-price/ high sales growth* shares (and labelled glamour stocks), respectively. Note that it is common in the finance literature to use "out-of-favor" stocks to mean "value" stock, and to use "growth" stocks to mean "glamour" stocks.

Fama and French (1992) argue that whatever the underlying economic causes, size and book-to-market ratio explain the cross-section of average stock returns for the period 1963-1990. They note that high book-to-market equity portfolios tend to outperform low book-to-market equity portfolios (low book-to-market portfolios earn an average a return of 0.30 % per month) by 1.53% per month. Moreover, they stress that book-to-market ratio plays a greater role than size as a characterisation of returns: "*although the size effect has attracted more attention, book-to-market equity has a consistently stronger role in average returns*" (p. 428). They support Chan and Chen's (1991) proposal regarding the size effect with regard to the book-to-market equity. By this they claim that firms with high book-to-market equity are firms with poor prospects, with higher levels of financial distress than low book-to-market firms, and therefore have lower prices as they are penalised by higher discount rates, leading to higher expected returns compared with those of the low book-to-market equity firms.

Strong and Xu (1997) highlight the importance of book-to-market equity over market value (size). Employing UK data over the period 1973-1992 they discover that when they include book-to-market equity or leverage (leverage is defined alternatively as: (1) Total Assets/ Market Equity, and (2) Total Assets/ Book Equity) along with market value, the latter becomes insignificant. Also, a previously UK study by Miles and Timmermann (1996) documents similar finding to that of Strong and Xu (1997) emphasising the higher role of the book-to-market ratio in explaining the cross-section of average stock returns over the period (1979-1991).

Fama and French (1993) repeat the same findings of Fama and French (1992). They document that high book-to-market firms (value firms) are associated with high financial distress which pushes stock prices down compared with the low book-to-market firms (growth firms). The observed positive relationship between book-to-market equity and the cross-section variation of average stock returns can then be easily justified because share prices are negatively associated with expected returns.

On the other hand, Kothari's et al. (1995) findings are a direct challenge to those of Fama and French (1992, and 1993) regarding the book-to-market ratio as they underestimated its importance in explaining stock returns. They provide evidence that the results in Fama and French (1992, and 1993) are highly influenced by survivorship bias. That bias is introduced by using two data sources: (i) the COMPUSTAT source to obtain stocks' accounting data (i.e., forming the book-to-market equity samples), and (ii) the Centre for Research in Security Price (CRSP) tapes to calculate portfolios' returns (including the benchmark returns). The COMPUSTAT suffers from several survivorship biases -CRSP does not.

They propose that the frequency of those shares that are on CRSP but not on COMPUSTAT (i.e., with missing financial data) experiencing financial distress is relatively high, since typically COMPUSTAT includes all the well established companies with high performance.

Kothari et al. (1995) also point out that in the late 1970s the inherent survivorship bias in the COMPUSTAT become even more pronounced. In the year 1978, COMPUSTAT launched a major database expansion project that increased the number of companies in the sample from about 2,700 NYSE/American Stock Exchange (AMEX) and large NASDAQ firms to about 6,000. Five years of annual data, going back to 1973, were added for most of these firms. The researchers argue that the survivorship bias introduced by adding firms to the sample with five years of history helps to explain the predictive power of book-to-market equity (B/M) in the work of Fama and French (FF). The sample selection issue raised by Kothari's et al. (1995) is driven by the rapid increase in the number *of small* stocks in the COMPUSTAT sample in the late 1970s. To clarify the idea, they consider an example of a company in 1973 with high book-to-market value (i.e., substantial assets but relatively poor earnings prospects, considerable uncertainty, and correspondingly low market value), such a company unless included in COMPUSTAT in 1978 is not likely to be included as a result of the mentioned COMPUSTAT data expansion because by 1978 it may possibly be delisted or does not qualify to be included. Even in the case where such a company experiences highly unexpected performance and therefore will be included in 1978 it will magnify and enhance the observed book-to-market premium. And so, as one goes to lower and lower market valuation firms on COMPUSTAT, one finds that the population is increasingly selected from firms having good 5-year past performance records.

In such a case where future losers with high book-to-market ratios are systematically excluded from the sample, the observed average returns in the sample for stocks with high book-to-market ratios will be above their real average without the COMPUSTAT survivorship bias (i.e., if COMPUSTAT included all the companies on CRSP, specifically, those with expected low performance). Accordingly, the researchers suggest that selection-bias problems in the construction of the book-to-market portfolios could be the cause for the observed premium[2]. Similar results are also obtained by Breen and Korajczyk (1994) regarding the hypothesised selection bias in the COMPUSTAT data. They construct a sample free from any selection bias from COMPUSTAT. They find that their estimated book-to-market effect is insignificantly different than zero (less than half of their estimated effect using the standard COMPUSTAT data).

[2] In the related literature, different approaches have been adopted to ease or as allegedly proposed to eliminate the COMPUSTAT survivorship data selection bias. From these, requiring firms to have a certain number of historical years, on COMPUSTAT before being part of the sample [e.g., Lakonishok et al. (1994) require five years, and Fama and French require two years] to ensure that the results do not rely on back-filled data. Some other studies tested subsample periods, such as Davis (1994) who examines back the period 1940 to 1963 using accounting data collected from the annual Moody's Industrial Manuals and then compares the obtained results with those of extended periods. Finally, a study by Chan et al. (1995), and another by Davis et al. (2000), expand the samples obtained exclusively form COMPUSTAT to include all the omitted firms from that source.

However, Davis (1994) uses a database that he claims to be free from survivorship bias since he investigates the value effect going back to cover the period 1940 to 1963. The finding is that book-to-market equity, earnings yield, and cash flow yield for the US stocks have significant explanatory power in the cross-section average stock returns. Also, Chan et al. (1995) show that the selection bias on COMPUSTAT is not so severe so as to explain the documented book-to-market equity phenomenon[3]. More importantly, they document superior performance of value stocks for the top 20% of NYSE and AMEX stocks.

Furthermore, Davis et al. (2000) expand the sample firms which typically used to be obtained from the COMPUSTAT data alone by using the Industrial Manuals to collect book common equity from 1925 to 1996 for all the NYSE firms that do not have book equity (BE) on COMPUSTAT, except for the financial firms, transportation firms and utilities. The results of their study emphasise that the value premium in US stocks is robust.

Behavioural finance studies such as that of Lakonishok et al. (1994) argue that it is investors' suboptimal behaviour and not being fundamentally riskier that causes value stocks to outperform glamour stocks. Investors, individuals and institutions, systematically are too optimistic about stocks that have had experienced good performance in the recent past (i.e., the glamour stocks are incorrectly believed to continue achieving very high growth rates of earnings, cash flow, etc.) and too pessimistic about stocks that experienced recent poor performance (i.e., the out-of-favour stocks are incorrectly believed to continue achieving very low growth rates). As a result of these systematic errors regarding extrapolating the recent

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[3] Chan et al. (1995) find: First, after excluding closed-end funds trusts, etc., the proportion of firms missed from COMPUSTAT compared with CRSP is only 9.6%. Second, just about 3.1% of the CRSP company-years were delisted as a result of being financially distressed and therefore were not included in COMPUSTAT. Third, average returns on NYSE and AMEX domestic primary firms (13.99% a year) is slightly less than those of the COMPUSTAT (14.25% a year).

past performance into future, prices of value stocks become extremely low making their expected returns extremely high compared with their fundamentals. On the other hand, prices of the glamour stocks become extremely high as a result of putting excessive weight on their recent good performance leaving these stocks with extremely low expected returns. Another study by La Porta (1996) shows the same findings. La Porta proposes that value shares outperform glamour shares because of systematic errors in expectations regarding future growth in earnings; these expectations are "*too extreme*".

On the other hand, Doukas et al. (2002) contradicts the behavioural finance proposal for the value-glamour anomaly. Using a US sample over the period (1976-1997), they fail to support the extrapolation hypothesis in favour of the hypothesis of compensation for risk. Similarly, Bernard et al. (1997) propose that the book-to-market ratio is more likely to reflect risk premia. Moreover, in the UK context, Miles and Timmermann (1996) document that the book-to-market equity, and to a lesser extent firm size anomalies, appear to be better measures of risk than beta, leaving any rationale for his finding as a major unanswered question.

2.4 Objectives of Financial Reporting and Accrual Accounting

Objectives and specifications of 'financial reporting' and 'accrual accounting' are considered in this section of this study. We argue that this is essential for purposes of understanding important concepts within the context of this research, such as "earnings or any of its components information content" and "earnings management", as well as in assessing whether the market is efficient or not regarding pricing the abnormal accrual component of earnings.

The main objective of financial reporting is to provide information about firms' historical, present, and most importantly future performance prospects. This information is useful according to both internal and external users of the accounting data. This information is communicated through financial statements which are usually prepared by managements of firms through a long process and according to a well known standards, principles and regulations.

Different financial statements provide different kinds of information that help in assessing enterprises' current and future, short and long-term performance prospects, along with their associated class of risk. To the scope related to this study, definitions and purposes of two of these statements are considered: the statement of cash flows and the income statement.

Dahmash (1996,p. 7) clarifies that "*the main goal for the statement of cash flow is to provide information about cash receipts and payments for an economic entity during a specific period, and the second goal is to provide information on cash basis for operating, investing, and financing activities for the enterprise*". Concerning the same issue, Kieso and Weygandt (1998) stress that the statement of cash flows helps in evaluating the ability of an enterprise to generate positive future net cash flows to meet its obligations, paying dividends, and explaining the difference between the net income and the net cash. Put differently, knowledge of an entity's liquidity represented in the amounts and timing of different cash receipts and payments, enables that entity from planning, evaluating and managing its operating, financing, and investing needs more efficiently.

Empirically, the statement of cash flows is a statement that traces the cash balance (i.e., cash and cash equivalent) starting from the beginning of period cash balance, and ending by the end of the period cash balance. It is then an equation that equals between the beginning of period cash balance plus (minus) net increase (net decrease) in cash flows during the same period and the end of period cash balance.

As a matter of fact, the net increase or net decrease in cash flow is equal to net change in cash flows from operating activities, plus net change in cash flows from investing activities, plus net change in cash flows from financing activities.

Cash flows from operations, which is of major importance for this study, refers to that part of the net increase or decrease (i.e., the net change) in cash flow that affects net income, in the sense that net operating income includes the net increase or decrease in cash flows from operation, in addition to a non-cash source operating income (alternatively, the operational accruals component of net income).

The statement of cash flows can be prepared using two different methods; the direct and the indirect methods. Drtina and Largay (1985) stress that the indirect method approach does not lead to the actual cash from operations "*because of numerous conceptual and practical problems encountered when applying the necessary adjustments*" (p.314).

In the same context, standards setters give managements specific range of freedom in the way they can report their economic transactions, even though if these transactions do not include receipts or payments of cash (i.e., contrary to the cash basis accounting), taking into account those managements' internal knowledge of value relevant information, Dechow and Skinner (2000).

This freedom regarding reporting the financial data is usually required to facilitate communicating value relevant information to interested internal as well as external parties, and therefore, increase the benefits from the financial reporting system. This is usually achieved by the implementation of the accrual basis accounting.

Kieso and Weygandt (1998) state that the principle of using accrual basis accounting is to ensure that the financial events that affect the financial statements are recorded in the period in which they occur rather than in the period in which cash is affected. They add "*using the accruals basis to determine net income means recognizing revenues when earned rather than when cash is received, and recognising expenses when incurred rather than when paid.*" (p. 6).

They also clarify that the accrual basis accounting uses: accrual, deferral, and allocation procedures with the goal of relating revenues, expenses, gains, and losses to periods to reflect an entity`s performance during a period instead of merely listing its cash receipts and outlays. Thus, recognition of revenues, expenses, gains, and losses and the related increments or decrements in assets and liabilities -including matching of costs and revenues, allocation, and amortization- is the essence of adopting the accrual basis accounting to measure the performance of entities.

Accrual basis accounting is required to prepare the income statement. The statement of income or statement of earnings is a statement that summarizes businesses' past performance for a specific period. That statement also reveals information that helps to predict the amounts, and timing of future operating cash receipts and payments.

As a matter of fact, income from operations is generally the most important figure that appears in the income statement. This figure reports revenues and expenses from the ongoing operational activities.

As was mentioned, income from operations includes two components: (i) a cash flow from operation component resulting from matching 'relevant to the income' cash receipts and cash payments, and (ii) an operating accrual component defined as income from operations minus cash flows from operation.

According to Dechow (1994), and Dechow and Skinner (2000), accrual accounting through using accounting principles such as revenue recognition and matching aims to enable investors to evaluate the economic performance during a period. They also add that earnings as a product of the accrual basis accounting is a better measure of performance than cash flows.

Wilson (1987), and Kieso and Weygandt (1998), differentiate between implications for cash flows from operation and other measures of performance that adopt the accrual basis of accounting. They declare that while the cash flow from operating activities concentrates on liquidity and short run prospects, the accrual basis accounting (i.e., revenues and expenses rather than cash receipts and cash payments, respectively) better signals the long run performance of an enterprise.

Regarding the same issue, Xie (2001), Sloan (1996), and Wilson (1987, 1986), among many others, believe that the accrual component of income and by the result the income itself as a measure of performance, is of higher risk than cash flow since they noisily signal companies' future performance. Also, Dechow (1994), and Dechow et al. (1995) address that firms adjust their accruals component of income on the basis of knowledge of the cash flows component. Put in other words, they observe high/low accruals for companies reporting low/high cash flows, respectively.

Houge and Loughran (2000) and Lakonishok et al (1994), report the importance of the cash flow as well as the accrual components of income to accurately determine the quality of earnings in a company. Bernard and Skinner (1996), and Bernard and Stober (1989) stress that, in their work, the information content of accruals is the same as of cash flows.

2.5 The Relationship between Accounting Earnings and Stock Returns

Over an extended period of time, considerable innovative research has been undertaken to explore the usefulness of income figures in addressing stock return (price) movements.

A pioneering study by Ball and Brown (1968) investigates that issue within the context of the EMH by observing stock prices at the time income is released for a sample of US firms over the period 1957-1965.

Their empirical work is simply built on decomposing each of the net income figures and the related security return into two components. While the first component is usually expected by economy-wide and market-wide effects, respectively, the second component is company specific resulting from matching the actual and expected figures.

Concerning earnings, the researchers view the unexpected component of total earnings for a firm as being signalling new information about future earnings for that firm, and consequently attribute its unexpected component of total returns to the unexpected component of total earnings, other things being equal.

Ball and Brown state that incomes of firms as well as security returns have been observed to partially move together. Moreover, knowledge of past behaviour between income and the respective economy-wide income index, and returns and the respective market index, in addition to knowledge of the current figures of the economy-wide income index and market index lead to estimating current income and current return figures.

Statistically, to address a certain income expectation formula for specific firm (j) in year (t), the researchers regress that firm's historical income changes on the corresponding changes in the average income of all firms in the market except for the firm j using data for up to year t-1. They refer to the average income of all firms by the 'economy-wide income index'.

Estimated income for year t is obtained by applying the year's t income index figure to the fitted income equation. Then, the unexpected part of income "income-forecast error" is obtained by matching the estimated and actual income figures.

Returns are decomposed in the same way; historical returns for stock j are regressed on the corresponding historical return market index figures to establish the estimated part of stock's j return in year t. And therefore, the stock's j, year t, unexpected return "return residual" is obtained by matching the year t actual and expected returns.

Then, the researchers consider the relation between the two mentioned estimated figures; the earnings forecast errors and return residuals over periods of 18 months, 11 months of them are prior to the annual income report announcement date.

As they hypothesize, Ball and Brown (1968) observe positive relation between the earnings forecasts errors and the return residuals, that is; once actual income is different from expected income, the market reacts in the same direction as the difference. Furthermore, they provide evidence that about (85 to 95)% of the income information content is captured by the time income is released.

Employing a different approach, Beaver (1968) explores the information content of the annual earnings announcement. He traces investors' reaction to the information content included in the earnings numbers as reflected in volume and price movements of common stocks in the weeks surrounding the announcement date. According to Beaver, any stock price changes usually reflect changes in the expectations of the market as a whole, while changes in volume of trading reflect changes in the expectation of individual investors. This, as the researcher considers, implies that the price test may be less sensitive than the volume test to information contained in earnings reports.

Using USA cross-sectional data for a sample of 143 firms listed on the New York Stock Exchange (NYSE) over the period 1961-1965, the results for both tests support the contention that earnings have information content for individual investors (as reflected in trading volume) as well as for the market as a whole (as reflected in stock prices).

For the volume test, starting from January 1, 1961 the study computes weekly averages of the daily percentage of shares traded for each stock over a period of 261 weeks. [For stock j, the weekly average of the daily percentage of shares traded in week (t) is equal to the number of shares traded during week t divided by the number of shares outstanding in the same week over the number of trading days in week t].

The procedure also requires computing weekly averages of the daily percentage of shares traded in week (t) for the sample as a whole. The obtained sample weekly averages of daily percentage trading days are plotted for 17 weeks centred by the income report announcement week. A significant increase in the trading volume is observed during the announcement week.

On the other hand, for the price test, Beaver employs the Sharpe model for measuring return, and traces the mean squares of the return residuals also for 17 weeks centred by the income report week date. The results are similar to those in the volume test, hence the price test indicate that earnings announcements have information content that affects the expectations of the market as a whole "the equilibrium prices". Beaver (1968) as well as Ball and Brown (1968), suggest further research aiming to construct expectations models to predict the magnitude and direction of price residuals in response to income numbers.

Beaver et al. (1979) extend Ball and Brown's (1968) work. They investigate the association between magnitudes of unsystematic security returns and magnitudes of earnings forecast errors, and so, their study sheds light not only on if there is relation between return residuals and earnings forecast errors (as in Ball and Brown 1968), but on the specification of this relation.

More specifically, where Ball's and Brown (1968) study investigates the null hypothesis: on average there is no systematic relation between return residuals (as a sign) and earnings forecast errors (as a sign), the Beaver's et al. (1979) null hypothesis proposes that the population (Spearman) rank correlation between the expected return residuals and the expected earnings forecast errors is on average equal to zero.

To estimate the unsystematic security returns (residuals) for a sample of 276 US firms over the period 1956-1975, the researchers employ the CAPM. On the other, to estimate the earnings forecast errors they employ two different earnings models. The earnings forecast errors estimated by each model are then deflated twice; (i) by forecasts of earnings per share for a stock (referred to as the percentage forecast error deflation method), and (ii) by the standard error of the earnings forecast error (called the standardized forecast error deflation method). Deflated earnings forecast errors using both earnings models and both deflation methods are arranged from the lowest to the highest, and 25 portfolios (each contains 110-111 firm-years) are formed. The expected mean portfolio of deflated earnings forecast errors for each portfolio is calculated and matched with its expected mean return residual.

A rank test statistic is applied. The results indicate a strong positive relationship between the return residuals and earnings forecast errors. Based on the portfolio results, 98% and 94% are the rank correlations for the percentage forecast errors and the standardized forecast errors methods of deflation, respectively, when applying the first earnings model. And 97% for both methods of deflation when using the second earnings model.

Beaver and Dukes (1972) shed light on the extent to which the functional fixation theory when applied to securities is valid. They use three different although related measures of earnings: these are: earnings as currently reported called deferral earnings (takes the interperiod tax allocation into account), earnings before the deferral entries are made (called non-deferral earnings), and cash flows.

Their study is motivated by the need to know whether investors are merely interested in the number of net income or in net income and its details. More specifically, they want to know if investors "fixate" on the last line in the income statement. If it is the case (i.e., investors fixate on the net income figure) then, there is a good justification for using different and costly accounting methods of financial reporting (e.g. First In First Out "FIFO", and Last In First Out "LIFO", ...), and for different regulatory requirements like the "deferrals" required by (APB Opinion No.11). Needless to say if that is true, it can be taken as evidence against the EMH.

On the other hand, if the market is efficient, there should be no need for different types of accounting reporting methods including the deferrals.

For purposes of consistency, they adopt the same terminology as in Ball and Brown's (1968). Using a sample of 123 US firms over the period 1950 to 1967, they estimated the Abnormal

Performance Index (API) for a period of 23 months centred by the earnings announcement month.

The income forecast errors were then computed, and the relation between these forecast errors and the return residuals using the Sharpe model is estimated. Their findings are: (1) Generally speaking there is a positive relationship between the income forecasts error and the return residuals. (2) Consistence with the EMH prices adjust rapidly at the time earnings reports release. These two findings match Ball and Brown. (3) Accounting reporting methods have different effects on the association between the forecast errors and the API, which means that security prices can be affected if the information system is to be altered.

2.6 The Nature and Amount of Information Content in Earnings, Accruals, and Cash Flows

Having said that many studies document positive association between earnings (as hypothesized of being able to summarize economic value information) and stock returns, an extensive body of research has been conducted to understand how different components of current income may have different implications for future incomes, and more importantly, how markets may capitalize (price or react to) these different implications of the different components of current earnings.

As a rule of thumb, efficient markets should correctly and rapidly capitalize through prices any value relevant information. In the context of accounting earnings, information about current earnings is said to be of content (i.e., value relevant) if it has something to tell about expected future earnings, and therefore, in an efficient market stock prices today are expected to reflect (value) tomorrow's expected earnings passing through today's earnings on the basis of the best available knowledge investors have regarding how much stable (persistent) earnings are (i.e., the relation between current and future earnings), Sloan (1996).

A mere significant relation between current earnings and future earnings means that any information about current earnings is value relevant, and should be incorporated in share price. And so, we may expect a share price response for new information that includes a significant change in the shape of relation between current and future earnings.

This line of research usually decomposes earnings into two main components: funds from operations component, and a corresponding accruals component. The funds component can take any of two different forms: it can be defined either as working capital from operations (equal to current assets minus current liabilities), or as cash flows from operations. When the funds from operations component is defined as working capital, the corresponding accruals component will be then defined as noncurrent accruals component, and if the fund from operations component is defined as cash flows, the corresponding accruals component will be then defined as total accruals component including both the current as well as the noncurrent accruals components. As a matter of fact, because of the high correlation between working capital from operations and earnings, most of the recent related literature, tends to define funds as cash flows from operations, and consequently, the accruals component as total accruals, which in turn (total accruals) can be divided into two main components: the normal accruals component (or as sometimes called the nondiscretionary accruals component) and the abnormal accruals component (or the discretionary accruals component)[4].

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[4] Prior research employs the terms "abnormal" and "discretionary" accruals to mean the difference between reported and expected accruals. Healy (1996) regrets using the terms "discretionary" and "nondiscretionary" accruals in his bonus plan paper (1985). He emphasises that if he to rewrite that paper today, he would certainly change these terms to be "unexpected" and "expected", respectively. Cheng and Thomas (2006) point out that they use the term "abnormal" instead of "discretionary" as they believe that the term abnormal is less suggestive to whether unusual accruals arise intentionally or unintentionally. According to this research the terminology "abnormal" versus "discretionary" is employed for the reason offered by Cheng and Thomas (2006). However, when other researchers' views are discussed, we sometimes commit the discussion to the terms they use. Also, note that the concepts "accruals unpredicted errors", "accruals unexpected errors", and "accruals prediction errors" are frequently used in the earnings management literature to mean abnormal accruals.

To investigate how much current earnings or any form of its components has information content regarding predicting future earnings, researchers often adopt at least one of the following two main approaches:

The first approach considers the absolute information content of a specific form or component of earnings [earnings/ normal earnings including cash flows and normal accruals/ cash flows/ total accruals/ normal accruals/ and abnormal accruals]. According to this approach, researchers generally regress future earnings (earnings in year t+1) as the dependent variable on any form or combination of forms of current earnings (earnings in year t) as independent variable(s). A significant coefficient for any of the components refers to the fact that such a component does have information content beyond and after the other components that are included in the regression, regarding generating future earnings. Such coefficients refer to income persistence, Freeman et al. (1982). These coefficients are usually described as forecasting coefficients since they result from regressing the income forecasting equation, e.g., Wilson (1987, 1986), Bernard and Thomas (1989), and Xie (2001).

The second approach investigates the incremental information content of a specific form of earnings after and beyond other forms. This is usually done by comparing specifications of two regressions: one of them without/with and another with/without the inclusion of the income component under investigation, respectively. For example, a researcher investigates how much incremental information content the abnormal component of earnings (i.e., abnormal accruals) does have in a specific case, they can regress future earnings once on current normal income and another on current earnings (the later includes the abnormal accruals in addition to the normal income component), and then account for the difference in the adjusted R^2 between the two regressions, which is solely attributed to the abnormal accruals component.

Another approach, for investigating the incremental information content of the abnormal accruals can be, for example, as follows: a researcher can regress future earnings once on current cash flows from operations and current normal accruals, and another on current cash flows, current normal and abnormal accruals. In such way the information content of the abnormal accruals component can be evaluated through considering: (1) the accruals coefficients and (2) the difference in the explanatory power between the two regressions represented in the adjusted R^2, where a regression with higher R^2 is preferred to another with lower R^2.

As a matter of fact, the efficiency with which a market prices a specific component or form of earnings is another related important issue that can be achieved by many ways; e.g., by regressing current returns on a single component or combination of components of current income, an efficient market should give each component of current earnings a relative weight exactly equal to its weight in generating future earnings (i.e., its persistence). Usually such regressed equations are described as the valuation equations and the estimated coefficients as the valuation coefficients. Mishkin (1983), Sloan (1996), and Xie (2001).

In summary, regarding information contained in current earnings, an efficient market should be able to perform two main functions:

1. The first function concerns comprehensively conducting immediate analysis for any new information to understand the exact effects that the new information may have on future earnings, and further, which component of future earnings will be affected (since on the average, for each component of earnings there is different pricing coefficient). Put differently, for new information regarding current earnings, efficient markets are required to correctly and quickly adjust values of the forecasting coefficients for the different components of current income considering the effect that the new information has on the persistence of income components. This is equivalent to saying that in an efficient market

a quick and rational understanding of the implications of new earnings information for future earnings is a must.

2. The second function concerns pricing the different components of income; a mechanism depends on the results from the first function. Efficient markets should rationally incorporate the relative different implications of the current components of income concerning generating future earnings. For example, if the following forecasting coefficients [0.8, 0.6, and 0.3] were correctly identified by the market as a result of regressing future earnings on current cash flows, current normal and abnormal accruals, then an efficient market is required to produce valuation coefficients of 0.8, 0.6, and 0.3 when current returns are regressed on the same current components of earnings, respectively. It is worth clarifying that such a condition does not in any way mean that earnings are the only factor that affects returns, and all it says is that current components of earnings affect current returns, each relative to its persistence.

For a market to be described as efficient at the semi-strong form level regarding information contained in current components of earnings, both functions should be correctly performed in a manner soon enough that any abnormal returns earned on the basis of such information is merely due to luck.

A study by Wilson (1987) is one of the earliest to explore the information content of earnings components. Employing fourth quarter's earnings and returns data for U.S firm-year observations, covering the period 1981-1982, Wilson explores whether the accrual and fund components of earnings, taken together, have incremental information content beyond earnings itself.

Wilson's mission is facilitated by nominating two main dates: the first date is when earnings and revenues as sums are publicly announced in the Wall Street Journal, and the second is when earnings details (accruals and funds components), arrive at the Security Exchange Commission (SEC).

A two-stage regression procedure is employed to investigate the accruals and funds information content. The first stage concerns measuring the funds forecast error (the difference between the funds expected and actual values) as a proxy for the new information at the time audited and detailed earnings data arrives at the SEC. The second stage considers the pricing of the new information through regressing abnormal returns as a dependent variable on the funds forecast errors as a regressor.

According to Wilson (1987) as well as to many others, the pricing of new 'related to earnings components' information released at some point of time is gauged by examining the association between market model residuals averaged over an event period (usually centred by the information release date), and the earnings components' forecast errors estimated during the same period. Wilson (1987) uses a nine-day event period, centred by the earnings details release date.

Two different approaches are used by Wilson to estimate the information content of earnings components; the regression approach and the portfolio approach. In the first approach, return residuals are cross-sectionally regressed against the funds forecast errors. In the second approach, Wilson forms three main portfolios for each funds' variable (the cash flow and working capital) described as low, medium, and high, depending on the magnitude of their funds forecast errors, and then, return residuals are regressed cross-sectionally against the funds forecast errors, each portfolio individually.

Wilson (1987) defines funds from operations in two different ways: (i) as 'working capital from operations' [=cash flows from operations + current accruals (current accruals include items like changes in inventories, receivables, and payables). Alternatively, funds are equal to earnings minus noncurrent accruals, where noncurrent accruals include items like depreciation, amortization, and deferred income taxes]. (ii) As cash flows [which equals earnings minus total accruals, where the latter includes both the current as well as the noncurrent accruals].

The findings indicate that earnings components have information content beyond earnings only when they are defined as cash flows and total accruals, the case in which a positive association between these components and stock returns was also been observed. On the other hand, the market does not react to funds defined as working capital from operations differently than to earnings themselves since earnings and working capital are highly correlated.

Another study by Wilson in 1986 considers in addition to the issues investigated in Wilson 1987 (that is, whether components of earnings taken together has information content beyond earnings itself), if accruals have information content beyond the funds component. As in Wilson (1987) this study employs U.S. data and covers the period 1981-1982.

Using the cross-sectional approach tests, Wilson (1986) finds evidence that the funds component (the accruals component) has information content, *i.e., causes the market to react,* after and beyond earnings (funds), respectively, when funds are just defined as cash flow but not as working capital. He notes: "*when funds and accruals are defined as cash from operations and total accruals, respectively, these parameters are both significantly different from zero and from each other. This result indicates that these components of earnings have incremental information content beyond earnings and beyond each other*" (p. 191).

And so, the results of Wilson (1987, and 1986) indicate that the market reacts positively to both unexpected cash flows and unexpected accruals, but more favourably to the former.
Bernard and Stober (1989) extend Wilson's (1987) work by investigating the nature and amount of information in cash flows and accruals. They employ U.S data covering the period 1977-1984 (an interval period which it is meant to include Wilson's study period).
Their findings indicate no support for Wilson's results. They stress "*we find no systematic difference between the implications of cash flows and accruals, as reflected in stock price behaviour surrounding the release of detailed financial statements*" (p. 625).

An important study by Sloan (1996) investigates whether stock prices incorporate information in current components of earnings regarding future earnings: cash flows from operations and total accruals. Sloan handles four main hypothesises: the first concerns whether the different components of earnings affect earnings stability differently (measured as rate of return on total assets). The second hypothesis concerns stock prices' ability to distinguish between the different implications of current components of earnings. The third hypothesis proposes a trading strategy to exploit the different pricing implications of different components of current earnings, and the last hypothesis is about the timing of any abnormal returns.
Sloan (1996) uses a sample of 40679 firm-year observations listed on NYSE and AMEX, covering 30 years from 1962 to 1991.
Regarding the first hypothesis, Sloan regresses future earnings on both current cash flows and current total accruals. His finding confirms his hypothesis: the cash flow coefficient is significantly higher than that of total accruals. Put another way, while both components contribute to future earnings, cash flow is of higher persistence than accruals. He justifies this finding by the possibility of affecting the accruals component through altering the accruals system (i.e., through managing earnings).

To investigate the second hypothesis he uses a framework was first developed by Mishkin (1983) to test the rational expectation hypothesis in macroeconomics. This test statistically compares between the market's evaluation of different components of current income as reflected in the coefficients of regressing current stock prices on current income components, and the ability of the same current income components to generate future earnings as reflected in the coefficients of regressing future earnings on different components of current earnings[5]. To explore the robustness of the Mishkin (1983) model, Sloan (1996) separately conducts two tests using the Mishkin approach. While the first test is without decomposing current earnings into its components, the second test is when current earnings is decomposed into cash flows and total accruals. While the finding for the first test is that the market is efficient, the finding for the second test, as was expected, is that investors fixate on earnings, resulting in total accruals being overvalued at the expense of cash flows, which is found to be undervalued. Sloan (1996, p 303) stresses "*stock prices do not appear to anticipate rationally the lower (higher) persistence of earnings performance attributable to the accrual (cash flow) components of earnings*".

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[5] What distinguishes the Mishkin (1983) framework is that it enables the conducting of direct comparisons for the efficiency with which each income component is priced individually, since its equations when regressed are deflated by a valuation multiplier refers to earnings (as a whole) response coefficient. That is, because of this deflation a test of market efficiency on the semi-strong form level can be conducted according to the following principle: for example, if the market values each £1 of current cash flows at £0.7 in the share price (the cash flow valuation coefficient), while each £1 of current cash flows generates £0.85 of future earnings (i.e., the cash flow forecasting coefficient), the first impression should be that the cash flow component of current earnings seems to be mispriced and more specifically undervalued. To make accurate inference regarding this possibility the Mishkin approach allows for further a test to know if the difference is significant or not. Conversely, if the valuation coefficient for any of earnings components is significantly higher than its forecasting coefficient, this refers to the market overpricing of the income component. Tests to know how efficient a market is regarding pricing an individual sub-income component can be conducted in similar manner to that of this example.

To investigate the third hypothesis Sloan forms decile portfolios on the basis of the magnitude of accruals in year t, and then he arranges these deciles from the lowest to the highest. His trading strategy (hedge portfolio) implies a long position in the lowest accrual portfolio and an offsetting short position in the highest accruals portfolio. To measure abnormal returns in this test he accounts for two kinds of risk; the first through computing size adjusted returns and the second through considering the Jensen alpha. A significant abnormal return of 10.4% is earned by the end of the first year for his hedge portfolio for both tests.

Concerning the fourth hypothesis, Sloan traces the size-adjusted returns for the decile portfolios (tested in the third hypothesis) over the following year. As in Bernard and Thomas (1990) he considers the announcement period for each quarterly earnings announcement as three days ending by the announcement day. And so, the annual announcement period is 12 trading days, and the annual non-announcement period averages 242 trading days. Sloan finds evidence that about 40% of abnormal returns are attributed to less than 5% of the trading days (i.e., the 12 announcement-day period). He adds "*these results are therefore consistent with a delayed price response to information in accruals and cash flows about future earnings*", (p 312).

Collins and Hribar (2000) employ U.S quarterly data (for a sample of 41237 firm-quarters) covering the period 1988 to 1997, to evaluate the robustness of Sloan's (1996) findings. Their results indicate that the market apparently overprices the accrual component of earnings as a result of overestimating the persistence of the quarterly accruals component of earnings (i.e., the market underestimates the transitory nature of the accrual component).

Houge and Loughran (2000) explore the pricing of accruals and cash flows from operations. Their work is also motivated by Sloan (1996) who proposes that investors commit a cognitive error as they price current components of income; failing to consider the transitory nature of accruals and the long run persistence of cash flows, and so, an accruals hedge portfolio can capture the market mispricing (anomaly) of components of income as a result of investors fixating (anchoring) on earnings as a sum figure, neglecting the information content in earnings components.

As a matter of fact, Houge and Loughran (2000) go further than Sloan. They hypothesize that the market differently misprices cash flows compared with accruals from operation. More specifically, the Sloan's (1996) accruals-based hedge portfolio defined as taking long (short) in the lowest (highest) accruals decile, respectively, may produce a significantly different abnormal returns to those abnormal returns from a cash from operations-based hedge portfolio defined as taking long (short) in the highest (lowest) cash flows decile, respectively, even though, the two hedge portfolios may share a high percentage of the same anomaly. They argue that each component of income generates different information content, and therefore, a better understanding regarding whether the market is efficient or not towards pricing income, one should consider the components of income. They stress, "*Together, they reveal the quality of a firm's current earnings. The imperfect correlation between the accrual and cash flow anomalies suggests that merging the hedge portfolios will generate even greater excess returns. A portfolio with high earnings quality (low accruals and high cash flows) should significantly outperform the market, while a low earnings quality portfolio (high accruals and low cash flows) will significantly lag the market*" (p. 168).

Houge and Loughran employ U.S data, covering the period 1963 to 1993. Their findings are supportive to their hypothesis. They observe annual buy-and-hold abnormal returns of 8.2 % and 10.4% for the accruals and cash flows hedge portfolios formed on the basis of the magnitude of accruals [taking long (short) in the lowest (highest) accruals decile, respectively] and cash flows [taking long (short) in the highest (lowest) cash flows decile, respectively]. They also observe distinctive characteristics for the extreme accruals and cash flows deciles regarding risk factors like: size, book-to-market ratio, and the persistence.

To assess the robustness of their findings, they employ the Fama and French (1993) three-factor model, the model that considers in addition to beta risk factor, both of the size and book-to-market ratio risk factors. In general, this model yields abnormal returns for the hedge portfolios quantitatively similar to those of the buy-and-hold.

In its final part, their study explores the market mispricing of an 'earnings quality' hedge portfolio, represented in buying long/short in the high earnings quality (low accruals and high cash flows)/low earnings quality (high accruals and low cash flows) deciles.

Empirically, the researchers create their earnings quality hedge portfolio through [buying long/going short] in the [high/low] cash flows with [low/high] earnings, respectively. This portfolio generates equally weighted excess returns of about 16% annually which is higher than the accruals (cash flow) based hedge portfolio by about 7.8% (5.6%), respectively.

Houge and Loughran conclude that such a result contradicts the hypothesis that both of the cash flows and accruals based strategies capture the same anomaly, in favour of having two distinguished anomalies: the accrual and the cash from operations anomalies. They also stress that while both the extreme cash flow deciles contribute significantly to excess returns, excess returns of the accrual-based hedge derive almost entirely from the firms in the high accrual decile. This evidence suggests that the market is consistently fooled by the potential of these firms to manage earnings.

Xie (2001) extends Sloan's (1996) work. He investigates the rationality with which the market prices the one-year-ahead implications of abnormal accrual earnings (i.e., the abnormal component of total accruals). Using a sample of 7506 US firms and 56692 firm-year observations covering the period from 1971 to 1992, he separates total accruals (as one of two major components for income: cash flow from operations and total accruals) into normal and abnormal components using the Jones (1991) model.

To investigate if the market is efficient in pricing abnormal accruals, Xie adopts the Mishkin (1983) approach exactly as in Sloan (1996). The results are:

- First, the forecasting regression coefficients resulting from regressing future earnings on different components of current income are [0.73, 0.7, 0.57] for cash flow, normal accruals, and abnormal accruals, respectively. To know if the coefficients are significantly different he applies F-tests, the findings are: the cash flow component of income is significantly of higher persistence than the normal accruals component of income, which in turn is of significantly higher persistence than the abnormal accruals income component.
- Second, the valuation coefficients resulting from regressing future returns on different components of current income are [0.67, 0.78, 0.69] for cash flow, normal accruals, abnormal accruals, respectively. To know whether these coefficients are significantly different than those generated by the forecasting regression coefficients, Xie jointly estimates the forecasting and valuation regression after imposing the rational pricing constraints regarding the equality between the forecasting and valuation coefficients for each income component [this procedure is required by Mishkin (1983)]. The findings are that for cash flow the valuation coefficient is significantly lower than the forecasting coefficient. On the other hand, while the valuation coefficients for both kinds of accruals are significantly higher than those of the forecasting coefficients, the difference is more aggressive for the abnormal accruals component of income. Put another way, while cash flow is found to be underpriced (undervalued), the accrual components are found to be overpriced (overvalued).

What distinguishes his study is that, Xie (2001) conducts another analysis to differentiate between different implications of current normal and abnormal accruals components of earnings regarding generating the one-year-ahead earnings (i.e., future earnings) on the valuation process, through using the idea of the hedge portfolio. He accounts for time-series means of annual size-adjusted abnormal returns for two comparative decile portfolios; while the first decile is formed on the basis of arranging firms from the lowest to the highest according to their estimated normal accruals, the second is formed on the basis of abnormal accruals.

Xie trading strategy requires forming two hedge portfolios. The first hedge portfolio is based on normal accruals; implying a long position in the lowest normal accruals and an offsetting short position in the highest normal accruals. The second hedge portfolio is based on abnormal accruals; implying a long position in the lowest abnormal accruals and an offsetting short position in the highest abnormal accruals. Average size adjusted returns (abnormal returns) for each hedge portfolio is computed for the years t+1, t+2, and t+3.

The first hedge portfolio, i.e., the normal accrual hedge portfolio, earns insignificant size adjusted returns of 2.3%, 1.1% and 0.2% for the above years, respectively. On the other hand, the abnormal accrual hedge portfolio, earns significant size adjusted returns of 11%, 7.4% and 1.9%, respectively.

Xie argues that the hedge portfolio that is formed on the basis of normal accruals suggests that the market does not overprice normal accruals, and he attributes the difference in results regarding normal accruals between this test and the Mishkin test to the fact that while the later considers all the sample the Xie considers just 20% of the largest sample. And concludes "*on the whole, I conclude that the market overprices abnormal accruals but does not materially misprice normal accruals, and that Sloan's (1996) findings that the market overprices total accruals is due largely to abnormal accruals*". Further, he hypothesizes that the market misprices abnormal accruals due to its overestimation of the one-year-ahead earnings implications (i.e., the markets failure to correctly expect the abnormal accruals persistence).

Xie (2001) conducts several sensitivity tests to clarify the robustness of his findings. These tests are as follows:

1. He computes abnormal returns for the hedge portfolios, using the Fama and French's (1993) three-factor model. The findings here are qualitatively similar to those of the size-adjusted returns, i.e., only abnormal accruals seem to be mispriced.
2. Xie repeats all the above tests [performed employing the cross-sectional Jones model (1991)], but using another five alternative accruals models: the time-series Jones model, and the cross-sectional and the time-series modified Jones models. Notably, similar results are obtained for normal and abnormal accruals.
3. Following Healy (1996), Bernard and Skinner (1996), and Hribar and Collins (2002) who argue that to make inferences regarding abnormal accruals valuation, researchers should make sure that the estimated abnormal accruals as part of income significantly represent the actual abnormal returns (i.e., no misclassifications or measurement errors in the estimated abnormal accruals), Xie investigated how the market prices abnormal accruals that do not include/exclude any normal accrual/abnormal accrual values, respectively, and repeats his tests after undertaking two main adjustments: the first concerns removing the after-tax special items (such as nonoperating gains and losses which are hypothesized by Bernard and Skinner 1996 as nondiscretionary, this is an example about misclassification) from total accruals. The second adjustment goes with Hribar and Collins (2002) regarding the possibility of creating material abnormal accruals measurement errors when total accruals are estimated through the balance sheet if the balance sheet contains events such as mergers, acquisitions, and divestitures. So, Xie estimates abnormal accruals after controlling for these non-

articulation events by deleting observations with mergers, acquisitions, and divestitures exceeding $10000. The results for both of the Mishkin as well as the hedge portfolio tests using the new refined measure of abnormal accruals indicate that the market misprices only abnormal accruals through significantly overpricing this component.

The results of Sloan (1996) and Xie (2001), which identify a simple relation between accruals forecast errors (earnings) and return residuals (returns) strike at the heart of market efficiency at the semi-strong form.

In the same context, Collins and Hribar (2000) point out the possibility that the accruals anomaly represented in overweighting the accrual component of income may result from discretionary practices. They believe that the discretionary accrual component of earnings through affecting the accrual component as a whole may disprove the efficient market hypothesis, if the market overestimated the persistency of accruals as a result of undetecting (or misinterpreting) the discretionary practices.

Bernard and Thomas (1989), stress that in an efficient market in the semi-strong form, for all firms categorized with pleasant earnings surprises in year t_{-1}, the weighted average abnormal return in year t should be equal to zero. Similarly, the same condition is required for all the companies with negative earnings surprises as well as for the market as a whole.

An interesting study by Subramanyam (1996) investigates the pricing of abnormal accruals using a sample of 21135 US firm-years comprising 2808 firms during 1973 to 1993.

To know if the market capitalizes information in the abnormal accrual component of income, Subramanyam uses two approaches: the first approach depends on estimating three univariate regressions to assess the absolute abnormal accruals information content. Abnormal returns are regressed individually on three firm income performance measures; cash flow from operations, normal income and net income. He judges the information content (the pricing) of the abnormal accruals based on the difference between the regressions in terms of the estimated coefficients and the accompanying R^2.

The second approach investigates the incremental information content of abnormal accruals using a variety of multivariate model regressions. According to this approach, abnormal returns are regressed on different combinations of income components. With caution of making mistaken inferences regarding the pricing of abnormal accruals if they were estimated with measurement error, Subramanyam indicates that the abnormal accruals component of earnings has information content, as does each of the operating cash flows and the normal accruals components. Subramanyam adds "*the results indicate that nondiscretionary income is more value-relevant than operating cash flows, but less than net income*" (p. 259). And further, he shows that the weight attached to the discretionary component is lower than the weight attached to the nondiscretionary component.

Subramanyam (1996) finds evidence consistent with managers of US firms using abnormal accruals to smooth earnings, and as follows[6]:

1 As in Dechow (1994) and Dechow et al. (1995), Subramanyam finds a significant negative relation between accruals and operating cash flows. And further, "*the evidence is consistence with discretionary accounting choices explaining a larger proportion of the negative correlation between accruals and operating cash flows than accrual accounting*" (p. 268). This result is presented with the same caution regarding the possibility of having discretionary accruals measurement errors.

[6] Tucker and Zarowin (2006) measure income smoothing by the negative correlation between a firm's change in discretionary accruals with its change in premanaged (i.e., normal nor expected) earnings and find evidence that income smoothing for a sample of US firms improves the informativeness of past and current earnings in predicting future earnings and cash flows.

2. On average standard deviation of net income (4%) is less than that of operating cash flows (7%), which, in turn, is less than that of normal income (9%).
3. From reporting the autocorrelation structure of the first differences (Δ) in net income, operating cash flows, and normal income, it is found that although the three variables are negatively correlated for up to three years, with most of the measure of performance mean reversion takes place in the first year for the cash flow and normal income, mean reversion for net income is more flatter (i.e., takes relatively more time). Subramanyam stresses that the evidence suggests more transitory nature for operating cash flows and normal income compared with net income. (p. 270).

Indeed, Subramanyam finds that net income has more stability and therefore, predictability than cash flow and normal income. He also finds that the evidence is consistent with discretionary accounting choice being used to communicate value relevant private information.

As a matter of fact, while Subramanyam (1996) indirectly considers the market is efficient in pricing abnormal accruals, his study does not provide the basis for such inference even though if we believed that discretion is not used for opportunistic purposes, since he does not answer the question: What fair price should be given to the abnormal accrual component of earnings?

2.7 Earnings Management.

2.7.1 Definition of Earnings Management

Earnings management is accomplished principally by timing reported or actual economic events to shift income between periods. This can happen according to Degeorge et al. (1999) as a result of the flexibility given by standard setters to accountants concerning the choice of, e.g., inventory valuation methods, allowance for bad debt, expensing of research and development, recognition of sales not yet shipped, and deferring expenses or boosting revenues by cutting prices.

Healy and Wahlen (1999, 368) define earnings management as "*managers use judgement in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on the reported accounting numbers*". They also clarify that earnings management can be used as a means of signalling by management to improve the information contained in accounting data.

Holland and Ramsay (2003, p. 42) point out that in addition to the signalling reason that implies using specific internal knowledge to smooth performance and increase the usefulness of financial reports " *the term earnings management implies management opportunism and/or and intention to mislead, giving the term negative connotations.*" And they add that discriminating between the two options is difficult.

Dechow and Skinner (2000), provide a more comprehensive vision about earnings management. They discuss why it is difficult to decide on a certain specific definition of earnings management, a definition that can successfully distinguish between different types of managements. They stress that the whole issue relies on words like "*intently,*" or "*deliberately.*" Since these words are believed to be difficult when spotted, measured, and analysed.

Dechow and Skinner explore the different points of views among practitioners, regulators and academics regarding the effects of earnings management. They view the first two parties as overestimating the extent of the problem, they add " *'No earnings management' is clearly not an optimal solution, some earnings management is expected and should exist in capital markets. This is necessary because of the fundamental need for judgements and estimates to implement accrual accounting to produce an earnings number that provides a "better" measure of economic performance than cash flows,"* (pp. 247-248). They believe that eliminating all flexibility given to managers would in turn eliminate the usefulness of earnings as a measure of economic performance.

Dechow and Skinner consider examples of discretionary accounting practices within GAAP requirements. They view the aggressive recognition of provisions or reserves or overstatement of asset write-offs as a 'conservative' accounting, while understatement of the provision for bad debts as an 'aggressive' accounting. About the 'real' cash flow choice, they consider delaying sales, accelerating research and development (R&D) or advertising expenditures as a 'conservative' accounting, while the opposite is an 'aggressive' accounting.

On the other hand they give examples like recording sales before they are realisable or recording fictitious sales or inventories which all involve deliberate misstatement or omission of material facts that affect decisions taken by different types of stakeholders, as cases of "fraudulent" accounting.

Subramanyam (1996, p. 267) reports that Moses (1987) defines smoothing as a form of earnings management with the objective to "*reduce the divergence of reported earnings from an earnings number that is 'normal' or 'expected' for the firm*".

Kieso and Weygandt (1998) indicate that it is not because of the emphasis on the statement of cash flows one should think that such a statement provides better information than the accrual accounting regarding predicting future cash flows, especially on the long run. They state

"*Over the long run, trends in revenues are generally more meaningful than trends in cash receipts.*" (p. 6).

Schipper (1989) emphasises opportunistic connotation of earnings management "*by 'earnings management' I really mean 'disclosure management' in the sense of a purposeful intervention in the external financial reporting process, with the intent of obtaining some private gains (as opposed to, say, merely facilitating the neutral operation of the process).*" (p. 92).

The literature that investigated this area of research views practices using accruals, changes in accounting methods, and changing in capital structure as the main means of earning management, Jones (1991), and Healy (1985).

According to Healy and Wahlen (1999), earning management is a process that implies both of costs and benefits. The costs are related to possible accompanied misallocation of resources. The benefits include "*potential improvements in management's credible communication of private information to external stakeholders, improving in resource allocation decisions,*" (p, 369).

In the same context, Burgstahler and Dichev (1997) report that the ex ante hypothesis implies that keeping the benefits of earnings management constant, the smaller the ex ante costs the higher the earnings management probability is. They proxy for the ex ante level of earnings management costs by the volume of current assets and current liabilities. They stress that manipulation is cheaper for firms with higher levels of current assets and current liabilities.

2.7.2 Examples of Earnings Management Studies, and Evidence on the Role of Auditing in Constraining Earnings Management

The earnings management literature is rich in studies documenting or denying practices of income-increasing or decreasing motivated by a variety of reasons. The generality of the studies which is covered by this section surrogate evidence of earnings management in observing significant estimations of abnormal accruals. Therefore, firms' reported earnings are usually described as of high (low) quality if they contain relatively low (high) amounts of the absolute value of abnormal accruals.

In this section, we account for some typical earnings management studies, including those reporting UK evidence, that relate to any of: (i) managers incentives and rewards, (ii) to avoid reporting earnings bad news in terms of earnings decreases and losses, (iii) to report earnings reaching published forecast targets [e.g., the case of Initial Public Offering (IPO)], (iv) to obtain reasonable conditions with lenders after violation of debt covenants, and (v) examples of studies documenting cases of earnings management for companies proposing to go private, around chief executive officers (CEOs) changes, and to benefit from import protection.

We also emphasise the existing literature with regard to the relationship between auditing and earnings management.

2.7.2.1 Examples of Earnings Management Studies

Earnings management is possible when executives' compensation depends on earnings-based schemes. Watts and Zimmerman (1978) conclude that to maximize their bonus compensations managers try to select income-increasing accounting procedures.

Healy (1985) explores the relation between managers' accruals and their rewards incentives for a sample of 94 firms listed on the 1980 Fortune Directory of the 250 largest U.S industrial corporations, covering a period from 1930 to 1980.

His theory is that, at the end of each financial period, managers observe the sum of cash flows and normal accruals, and then adjust this sum through discretionary accounting procedures in order to maximize their expected bonus awards. Here, Healy views discretionary accruals (sign and magnitude) as function of earnings before discretionary accruals, the bonus plan, the opportunity for discretionary accruals, the discount rate, and finally the manager's risk concerning the timing of receiving bonus awards.

Unlike prior research, such as conducted by Watts and Zimmerman (1978), Healy (1985) introduces the possibility of income-decreasing as well as income-increasing incentives.

Healy accounts for the association between accruals and bonus plan parameters, through computing differences among mean accruals (scaled by lagged total assets) for different types of portfolios that are hypothesized to have different discretionary accruals incentives under specific conditions related to the actual bonus plan. His findings indicate significant differences for all of his tests and as expected by his compensation theory, Healy points out "*managers are more likely to choose income-decreasing accruals when their bonus plan upper or lower bounds are binding, and income-increasing accruals when these bounds are not binding*". (p. 106).

Employing US data Cheng and Warfield (2005) observe that managers with equity holdings and equity based compensation have incentives to manage earnings upward to increase the value of their wealth. More specifically, they document that such managers are likely to report earnings that meet or just beat analysts' forecasts. However, Erickson et al. (2006) report contrary results of no consistent evidence that executive equity incentives are associated with fraud.

In the same context, Bauman and Shaw (2006) clarify that managers with a high proportion of stock option components in their compensation plans have higher incentives to meet or exceed analysts' forecasts. Baker et al. (2003) find evidence that practices of managers of a sample of US firms with relatively high option compensation are associated with income decreasing choices in periods leading up to option award dates to lower the exercise price of the options. However, Coles et al. (2006) provide evidence that abnormally low discretionary accruals resulting from US managers manipulating their companies' earnings in the period following announcements of cancellations of executive stock options up to the time the options are reissued have little power in explaining stock performance.

Burgstahler and Dichev (1997) find evidence that companies manage earnings to avoid earnings decreases and losses, through manipulating any of two components of earnings; cash flow from operations and changes in working capital, indicating that there are higher incentives for firms to manipulate to sustain a certain previous level of earnings or so as to avoid losses than otherwise the case is. They provide evidence that from 8% to 12% of the firms with small pre-managed earnings decreases exercise discretion to report earnings increases. Similarly, 30% to 44% of the firms with slightly pre-managed negative earnings have been found exercise discretion to report positive earnings.

They also find evidence that firms with longer preceding strings of either reported increases in earnings or in positive incomes have been proved to have exceptionally high incentives to manage earnings.

Holland and Ramsay (2003) extend Burgstahler and Dichev's work using the same methodology on Australian data. They examine the pooled, cross-sectional distribution of reported earnings and again they find discontinuity around key earnings thresholds; they notice more frequencies of small earnings increases and small positive profits than expected exactly to the right of zero earnings changes and earnings, respectively. And considerably fewer small earnings decreases and small losses (negative incomes) than expected to the left of the same earnings thresholds. They also report that their findings are much stronger for larger Australian firms.

The researchers present two theories motivating earnings management. While the first concerns transaction costs with stakeholders, the second is based on the prospect theory. They propose that these theories are of great influence around points of cut offs in earnings (e.g., when the change in earnings is close to zero).

They summarise the stakeholders motivation as that firms with higher earnings face lower transaction costs with stakeholders. This theory takes the view that stakeholders consider the zero earnings change cut offs as a benchmark to decide on accepted transaction terms.

About the prospect theory [first advanced by Kahneman and Tversky (1979)], they stress that decision makers when evaluating all value relevant information look not only at the absolute change in wealth, but they relate these changes to a reference point. In addition, they add that the prospect theory implies that individuals' value functions are concave in gains and convex in losses (S-shape); that is, value functions are steepest near wealth reference points, indicating to those points of earnings when managements try to avoid small negative incomes by small positive ones, or to change a small decrease in incomes by a small increase. Moehrle (2002) shows that evidence from US sample firms suggests that firms manage earnings to avoid bad news earnings surprises and net losses. Gore et al. (2007) provide evidence that the UK quoted non-financial firms over the period (1989-1998) use abnormal accruals to meet targets defined as avoiding reporting small negative income levels and changes. They emphasise "*This evidence confirms that discretionary accruals are used in managing earnings to achieve targets, and validates the use of such accruals as a proxy for earnings management*" (p. 141). Moreover, Matsumoto (2002) clarifies that firms with higher transient institutional ownership and greater reliance on their stakeholders are more likely to manage their earnings according to key thresholds at the earnings announcement. Roychowdhury (2006) provides evidence that managers manipulate real activities such as temporarily reducing prices to encourage sales and overproduction to lower costs of goods sold through reducing the fixed costs per unit of production to avoid reporting annual losses.

On the other hand, Coulton et al. (2005) point out that caution is required in interpreting results such as that obtained for the Australian firms being documented to be engaged in earnings management in the form of histogram discontinuities at key earnings thresholds. For an Australian sample, they observe high positive abnormal accruals for the benchmark beaters as well as for the firms that just missed the benchmark.

Albornoz and Alcarria (2003) indicate that managers of Spanish sample firms manage their earnings according to pre announced targets. Gramlich and Sørensen (2004) show that managers of Danish IPO firms manage earnings to reach their voluntarily published forecast targets. Similar findings are obtained by Cormier and Martinez (2006) for French IPO firms. Jaggi et al. (2006) find evidence of earnings management by IPO Taiwanese firms, which were required as from 1991 to include annual earnings forecasts in the IPO prospectuses, to reach their earnings forecasts.

In the same context, Daniel et al. (2008) provide evidence that managers of US firms alter the accrual system to increase earnings when their earnings would otherwise fall short of expected dividends levels as they are reluctant to cut dividends. Hribar et al. (2006) show empirically that US firms repurchase their stocks to increase earnings per share (EPS) if their EPS without the repurchase would have missed analysts' forecasts.

Furthermore, earnings of firms can be managed in periods containing the reporting of debt covenant violation. DeFond and Jiambalvo (1994) observe positive abnormal accruals for US sample firms reporting debt covenant violation in the year preceding and the year of violation. Also, Saleh and Ahmed (2005) find evidence that Malaysian debt renegotiation firms subsequent to debt covenant violation (i.e., distressed firms), adopt income-decreasing choices during the year surrounding renegotiations with lenders.

DeAngelo (1986) investigates the effects of a proposal "to go private" on the accounting decision of 64 publicly held US firms over period of 10 years starting from 1973. She considers the tendency of these firms to get involved in income-decreasing earnings management through altering the accrual system in order to reduce the buyout compensation, since, as she believes, that the most commonly used "price" determinant techniques are those related to earnings-based valuation method. The results of this study indicate that managers of firms that were proposing to go private did not systematically understate earnings in periods before a management buyout of public stakeholders. On the other hand, Wright et al. (2006) compare between 92 UK and 63 US firms that were taken private in a management buyout (MBO) during the periods (1997-2002) and (1981-88), respectively, exploring the incidence of earnings management. They employ the MJM to estimate abnormal accruals. Their finding is that companies involved in MBO's in both countries have been found to be involved in managing earnings downwardly prior to an MBO, they also document that US managers are significantly more aggressive than UK managers (p. 25).

Wells (2002) explores the extent of earnings management in periods surrounding CEO changes. The results show that new CEO members adopt income-decreasing abnormal accruals decisions, referred to by Wells as 'earnings bath', with the evidence being stronger for enforced CEO changes.

Jones (1991) explores whether managers of domestic producers would engage in income-decreasing accruals decisions to benefit from import protection, during the investigation period by the United States International Trade Commission (ITC).

More specifically, she conducts a cross-sectional analysis to know if a sample of 23 firms from five industries has engaged in income decreasing earnings management during the investigation period relative to non-investigation periods.

Jones's findings indicate that in order to benefit from import protection, managers of domestic producers would attempt to decrease their earnings through choosing income-decreasing discretionary accruals.

2.7.2.2 The Role of Auditing in Constraining Earnings Management

Many studies have questioned the role of auditing in constraining earnings management. The evidence on that issue is conflicting. Employing US data, Krishnan (2003) stresses the importance of audit quality and the pricing of abnormal accruals. More specifically, he indicates that the link between stock returns and abnormal accruals is greater for firms audited by big six auditors compared with those audited by non-big six auditors. The evidence in Krishnan's study is that big six auditors constrain aggressive and opportunistic accruals. Similar evidence is documented by Francis et al. (1999) who observe better quality audits provided by big six auditors compared with those of non-big six auditors. On the other hand, Caneghem (2004) employs UK listed companies data for just one year as in the 1998 to investigate management discretion differences between clients of big-five and clients of non-big-five auditors. The findings do not suggest that big-five auditors constrain earnings management practices. When they partition firms on auditors' industry expertise they find weak evidence that specialist big-five auditors constrain earnings management (p. 771).

In an important study, Frankel et al. (2002) provide evidence that audit fees (nonaudit fees) are negatively (positively) associated with abnormal accruals in US sample. Moreover, they add that share prices are negatively correlated with the nonaudit fees at the date the amount of these fees is released. Another study by Reynolds et al. (2004) concludes similar results to Frankel et al. (2002).

These findings are challenged by Ashbaugh et al. (2003) and Chung and Kallapur (2003) whose evidence rejects the hypothesis that auditors' independences are impaired by clients purchasing more nonaudit fees.

Bauwhede and Willekens (2004) show that auditor size is not correlated with a better audit quality in terms of the generated abnormal accruals in the Belgian market.

Menon and Williams (2004) investigate the issue of firms hiring a former partner from their present auditor, a practice which is usually referred to as 'revolving door'. Using a sample of US firms, they illustrate that such companies report higher abnormal accruals than other firms. Geiger et al. (2005) explore the same issue (i.e., the audit-to-client revolving door and earnings management) employing US sample. The findings indicate no evidence of increased earnings management in the form of abnormal accruals before or after hiring senior financial reporting executives directly from the sample firms' external auditors.

Johnson et al. (2002) clarify the effect of the length of the auditor-client relationship referred to as 'audit tenure' on audit quality in the form of abnormal accruals, where audited reported earnings with low abnormal accruals are considered of better quality than with high abnormal accruals. For a sample of US firms, they observe reduced financial reporting quality only for the short and medium audit-firm tenures of (2 to 3 years) and (4 to 8 years). In contrast, no evidence of high abnormal accruals in earnings reported by audit-firm tenures of nine years or more. Similar findings are also provided by Myers et al. (2003) who observe higher earnings quality (lower abnormal accruals) associated with longer audit tenure. In a more detailed analysis, Nagy (2005) investigates that the effect of the mandatory (forced) auditor changes by ex-clients of Arthur Andersen. The results show a decline in abnormal accruals for only small size clients with low bargaining power.

Heninger (2001) reports a positive relation between the risk of auditor litigation and abnormal accruals as an indicator of earnings management in US firms. Furthermore, Abbott et al. (2006) show that for a sample of US companies the higher (lower) the evidence of earnings management as surrogated by abnormal accruals, the higher (lower) the audit fees are.

2.8 Summary

This chapter explores the implications of accrual and cash basis accounting in share prices within the context of the EMH. Reviewing the existing earnings management literature, accrual and cash flow components of reported earnings are found to have incremental information content beyond earnings and beyond each other.

Following Sloan (1996), considerable evidence has been documented showing that investors irrationally anchor on earnings, in forming their expectations, unable to anticipate the transitory nature of accruals and the long run persistence of cash flows. And so, an accrual hedge portfolio of buying long (selling short) the lowest (highest) accrual portfolio, respectively, has been successfully used to capture accrual mispricing. A common justification for the observed anomaly is that accruals are generally exposed to being affected through altering the accrual system (i.e., through managing earnings).

Further research, e.g., Xie (2001), emphasise that the accrual anomaly documented by Sloan is mainly due to investors failing to anticipate the implications of abnormal accruals defined as total accruals (used by Sloan) minus normal accruals. Consequently, the hedge portfolio implies a long position in the lowest abnormal accrual portfolio and an offsetting short position in the highest abnormal accruals portfolio.

In the next chapter, four well-addressed alternative models to decompose total accruals into normal and abnormal parts are discussed with more focus given to the MJM being the model used by this study.

CHAPTER THREE

LITERATURE REVIEW "TWO"

3.1 Introduction

This chapter is split into five main parts. The first reviews the general accounting accrual-based tests' design. The second investigates four important earnings management models, these are: the Healy model (1985), the DeAngelo model (1986), the Jones model (1991), and the Modified Jones Model (1995). The third explores statistical specifications of the four models regarding the associated levels of risk they produce in the form of type *I* and *II* errors. More specifically, we show empirically why the Modified Jones Model is preferred to the rest of models, and therefore, is used by this study. The fourth part discusses main areas of variation among researchers regarding how they employ the Modify Jones Model. We finally, summarise why an estimated abnormal accruals figures can be misleading.

3.2 General View of Earnings Management Accrual Models

Recently, there have been many attempts to develop a reliable model to detect earnings management. Generally speaking they propose what the situation would be in the absence of earnings management, and then account for the difference between what is *expected* for operating accruals (using data from the estimation period) and the *actual* operating accruals (using data from the event period). Following this, they examine the significance of the difference between the expected and the actual accruals through *t*-statistics for the hypothesis H_0= the average change or difference equals zero.

These tests focus on the magnitude of earnings management by the absolute difference, and the direction by noting the sign of that difference, (e.g. a significant positive difference means a significant possibility of managing earnings to increase reported income).

To detect earnings management, most of these studies concentrate on analysing accruals either when taking accruals as an aggregate of a variety of different accrual variables or considering just one kind of accrual such as provisions for bad debts. This focus on accruals as the primary indicator of earnings management is due to the following:

(1) Accruals include very important items like accounts receivable, inventory, and other payables that are particularly vulnerable to a very high level of accounting discretion and manipulation. With that regard, Healy (1985) stresses that accruals modify the timing of reported operational income.

(2) Discretion over accruals is difficult to uncover compared with other kinds of manipulation such as changing accounting procedures. McNichols and Wilson (1988) and DeAngelo (1986).

The latest models used to detect earnings management, e.g., the Jones (1991) and the Modified Jones model (1995) usually regress total operational accruals on variables that are believed to have the most effect in generating the level of *normal* operational accruals. Jones (1991), and Dechow et al. (1995) consider variables like: *revenues* (referring to requirements for the normal operational cycle), and the *gross durable assets* (more durable assets result in more depreciation; the non-discretionary part of operating accruals), as the main variables that drive the level of normal operational accruals. By applying Ordinary Least Squares (OLS) procedure to such variables using historical data over a period of time, usually called the estimation period, these models enable researchers to estimate normal accruals for current years given current values of revenues and gross durable assets. Then a researcher can judge earnings management for a specific year by noting the difference between its expected and actual accrual values on the basis of *attributing* the difference to a stimulus hypothesised by the researcher.

It is worth noting that while on the whole the above mentioned models do not vary in defining and calculating *actual* total accruals (TA), they vary significantly in the formula used to *predict* total accruals (i.e., *normal* total accruals).

Previous studies, (e.g., Healy 1985, Jones 1991, and Dechow *et al* 1995) use the following formula to calculate actual 'assets-deflated' total accruals:

$$\mathbf{TA_t/A_{t-1} = (\Delta CA_t - \Delta CL_t - \Delta Cash_t + \Delta STD_t - Dep_t)/(A_{t-1})} \qquad (1)$$

Where:

TA = total accruals

ΔCA = change in current assets.

ΔCL = change in current liabilities.

Δcash = change in cash and cash equivalent.

ΔSTD = change in debt included in current liabilities.

Dep = depreciation and amortization expense.

A = total assets.

t = current year.

Researchers investigating this area often look at the above formula as being divisible into two main parts; the normal and abnormal accruals.

Healy (1985) defines normal accruals as accounting adjustments to the firm's operational cash flows mandated by accounting standards. On the other hand he points out that "*discretionary accruals are adjustments to cash flows selected by the manager. The manager chooses discretionary accruals from an opportunity set of generally accepted procedures defined by accounting standard-setting bodies*" (p. 89).

3.2.1 The General Accounting Accrual-Based Tests' Design

The following presentation draws heavily on a related analysis in McNichols and Wilson (1988) and Dechow et al. (1995), as they investigate experimental linear framework issues regarding the accrual-based earnings management models. [These researchers try to find out a general frame that governs how earnings management models work in practice, and then comment on the usefulness of such models based on: (i) the ability of such models to isolate abnormal accruals from total accruals, and (ii) the ability of these models to attribute earnings management (i.e., abnormal accruals) to a specific earnings management stimulus hypothesised by a researcher (i.e., the specification of models)].

In the following discussion, the terms non-discretionary accruals (NA) and discretionary accruals (DA) are used interchangeably with normal and abnormal accruals, respectively, to facilitate comparison with the mentioned studies.

The main goal for any earnings management model is to identify the *actual* magnitude of earnings management, i.e., actual discretionary accruals ($DA_{act.}$), as follows:

$$\mathbf{TA}_{act.} = \mathbf{DA}_{act.} + \mathbf{NA}_{act.} \qquad (2)$$

Where: TA_{act} refers to actual total accruals, and $NA_{act.}$ to actual non-discretionary accruals.

This equation requires knowledge of two variables to calculate a third. Unfortunately, $TA_{act.}$ is the only variable that can be calculated fairly reasonably using a formula like (1) in the previous section, while both of DA_{act} and $NA_{act.}$ are unobservable.

The method employed in the literature is to *estimate* Discretionary Accruals (DA_{est}) as a proxy for DA_{act} with error (υ) after estimating non-discretionary accruals (NA_{est}) that proxy for NA_{act} with measurement error (τ). And so equation (2) can be rearranged as follows[1]:

$$TA_{act.} = DA_{est.} + \upsilon + NA_{est.} + \tau \quad (3)$$

Supposing that the employed earnings management model is well-specified, a researcher will be dealing with the following equation:

$$DA_{est.} = DA_{act.} + \upsilon \quad (4)$$

As a matter of fact, DA_{act} is a function of *dummy* variable (PART) that partitions the data set into two groups or more, and K number of other relevant variables (X) where (K is equal to one or more).

According to the dummy partitioning variable PART, one should not expect real tests of earnings management to explicitly mention anything regarding that variable, although implicitly they do. In a typical earnings management study, a researcher usually hypothesises that for a specific reason such as a new law with different implications for different levels of firms' reported incomes, managers of firms that have been influenced by this law, have incentives towards managing earnings either upward or downward, so as to achieve some benefits either on the personal level as managers or on the corporate level as firms. As a

[1] Note that the different models of earnings management merely differ in the equation that generates (predicts) NA_{est} as will be emphasised later. An accurate estimate of DA requires a reliable estimate of NA; since as appears from equation (3), the measurement errors τ of NA are negatively perfectly correlated with errors υ of DA. Said another way, a good model to detect earnings management should generate low non-discretionary measurement errors τ to minimize υ.

result, the procedure of any earnings management test requires considering (selecting) just those firms which have been affected by the new law as a group by implicitly giving the stimulus PART a value of 1 for each of the selected firms to distinguish them from other firms which have not been affected by the law and therefore are given a value of zero for PART[2].

By noting differences between what earnings would be in the absence of the new law for the chosen group of firms and what earnings in reality are for the same group, or more specifically, between accruals *with* and *without* the new law, a researcher estimates whether the new law caused the sample firms to manage earnings.

About the K number of other relevant variables, researchers usually consider, at least theoretically, the possibility that DA may result from a combination of many other factors (K number of relevant factors) in addition to if not rather than the hypothesised by researcher earnings management factor PART. And so, a well-specified model of discretionary accruals takes the form:

$$DA_{act.} = \alpha + \beta \, PART + \Sigma \text{ effect of (K) number of relevant (X) variable(s)} + \varepsilon \quad (5)$$

Where: (β) represents the magnitude of earnings management that relates to the stimulus specified by the researcher, and β's sign refers to the direction of earnings management. Considering Eq.(5) and Eq.(4) together:

$$DA_{est.} = \alpha + \beta \, PART + \Sigma \text{ effect of (K) number of relevant (X) variable(s)} + \varepsilon + \upsilon \quad (6)$$

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[2] Dechow *et al* (1995, p. 195) points out that the dummy variable takes a value of one in the event period for a hypothesized by researcher stimulus, and value of zero during the estimation period.

Because none of the k number of relevant variables (X), ε, and υ is observable, they are excluded from equation (6). Consequently, the following regression of earnings management represents the general accrual-based tests' design:

$$DA_{est.} = \dot{a} + \dot{b}\,PART + e \tag{7}$$

Statistically, two issues are important as a result of this exclusion of variables that ought to be included in the regression (i.e., the k number of relevant variables (X), ε, and υ). First, the estimated $\dot{b}$ standing for the magnitude of earnings management can be a biased estimator of the population's parameter β. Gujarati (1992) states that for the case of a regression consists of two explanatory variables, and one of them was excluded, then the magnitude and direction of the bias in the estimated parameter will be equal to the result of multiplying the slope coefficient (sign and magnitude) that stems from regressing the dependent variable on the omitted explanatory variable (as if both of the explanatory variables are included), by the slope coefficient (also sign and magnitude) that results from regressing the omitted explanatory variable on the included variable. This leads to conclude that the only case, in which the estimated coefficient of the included explanatory variable is supposed not to be biased, is when the included and the excluded explanatory variables *are not* correlated.

Consequently, the following are the possible effects of omitting a significant correlated explanatory variable (correlated refers to the case when the existing and omitted explanatory variables are correlated):

- When the sign of the correlation is the same as the sign of the slope coefficient of regressing the dependent variable on the excluded explanatory variable, the coefficient of the included explanatory variable (in the misspecified equation) will be *overestimated* whatever its actual (true) value is.

- On the other hand, when the sign of the correlation is opposite to the sign of the slope coefficient of regressing the dependent variable on the excluded explanatory variable, the coefficient of the included explanatory variable (in the misspecified equation) will always be *underestimated.*

The implication of a biased $\breve{b}$ on hypothesis testing can be clarified through considering the effect of the estimated $\breve{b}$ on the value of t-statistic= [$\breve{b}$ / ($SE_{\breve{b}}/\sqrt{N}$)]. Where : $\breve{b}$ refers to the estimated manipulation, $SE_{\breve{b}}$ refers to the sandard error of estimated manipulation, and N refers to number of observations included in the estimation process]. It is therefore, biasing the absolute value of $\breve{b}$ upwardly (downwardly) may lead to rejecting (accepting) the null hypothesis (H_0) whatever H_0 is, i.e., true or false.

The second problem for excluding variable(s) that ought to be included in the regression is that the estimated standard error (SE) of $\breve{b}$ will be a biased estimator of the standard deviation of the population parameter β. As a matter of fact, even if the included and excluded explanatory variables *are not* correlated and therefore the estimated coefficient of the included explanatory variable is unbiased, the expected variance of the coefficient of the included explanatory variable will always be *overestimated.* Overestimation of (SE) of $\breve{b}$ is leading to accepting the hypothesis whatever the hypothesis is. Regarding the same issue, Gujarati (1992) notes that "the *confidence interval will be wider, therefore one may tend to accept the hypothesis that true value of the coefficient is zero (or any other null hypothesis) more frequently than the true situation demands*". (p. 383). For better understanding, please consider the effect of the denominator value (i.e., $SE_{\breve{b}}$) in the t-statistic equation= [$\breve{b}$ / ($SE_{\breve{b}}/\sqrt{N}$)] on hypothesis testing. The higher $SE_{\breve{b}}$ is, the more likely the hypothesis H_0 is accepted.

3.3 Four Famous Accrual Models to Estimate Normal Accruals

Recently, there have been many attempts to develop a valid model to detect cases of earnings management using accruals [i.e., without a significant measurement error, the element that so far constitutes the main concern that is taken against such models, Healy and Wahlen (1999)]. Of these, this section will explain four well-known models, starting from the oldest reaching the Modified Jones Model suggested by Dechow et al. (1995).

3.3.1 The Healy Model (1985)

This model is one of the most important recent models that adopt accruals as a means for detecting earnings management. It decomposes accounting earnings from operations into cash flows from operations and total accruals from operations (the same as of all other models), as follows:

$$\mathbf{E}_t = \mathbf{CF}_t + \mathbf{TA}_t \qquad (8)$$

Where: E_t is earnings from operations in year t, and CF_t is cash flows from operations in year t.

TA, is in turn, decomposed into NA and DA as mentioned earlier in Eq.(2). This creates:

$$\mathbf{E}_t = \mathbf{CF}_t + \mathbf{DA}_t + \mathbf{NA}_t \qquad (9)$$

Healy also:

1. Uses total accruals as a *proxy* for discretionary accruals. That is, Healy considers $NA_t = 0$, → Eq.(2) can be represented as, TA = DA → Eq.(9) can be represented as: $E_t = CF_t + DA_t$.
2. Considers cash flows from operations as *proxy* for earnings *before* discretion, for the

most part of his research. In the absence of earnings management: DA=0 → ($E_t = CF_t + DA_t$) becomes → $E_{t,\ before\ discretion} = CF_t$.

His accrual tests compare the actual sign of accruals for a particular firm-year observation with the predicted sign given the managers' bonus incentives.

According to Healy there are *two* important 'before-accrual-managed' earnings benchmarks: (i) the *lower bound or the earnings target* which is usually determined by any bonus scheme that specifies at least the lower bound figure (any amount of earnings that is less than this point a manager will not be rewarded, and so, according to Healy, a *binding lower bound* that arises when earnings, even if to consider all available income-increasing choices, are less than the lower bound), and (ii) the *upper bound* point which is usually determined by any compensation plan that at least specifies an upper bound figure representing a limit of earnings beyond the earnings target, hence after that limit earnings will not be appreciated by the bonus scheme. Therefore, a *binding upper bound* that arises if earnings before discretionary accruals are more than the upper bound mentioned in the bonus plan.

A total of 1527 firm-year observations that have specified earnings-based bonus contracts, are partitioned into three main group portfolios: the first portfolio is called 'LOW' includes all the observations with *binding* lower bound. The second group portfolio 'UPP' comprises all the observation with *binding* upper limit. The LOW and the UPP portfolios are hypothesised to have income-decreasing discretionary accruals incentives to maximize any possible future bonus utility without really affecting current incentives[3].

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[3] The LOW and UPP groups have been constructed to be *binding*, that is; they bind managers of firms in these groups from managing income-increasing accruals since this will not be positively rewarded

On the other hand, the third 'MID' contains all the observations that are excluded from the first and second groups, and hypothesised to have income-increasing discretionary accruals incentives to maximize the accumulated bonus over a specified *two* periods, as proposed by the researcher. And so, the MID portfolio has been constructed to be *unbinding*, that is; income-increasing discretionary accruals practices can be positively rewarded by bonus schemes[4].

Healy accounts for the association between accruals and bonus plan parameters, through computing:

- Differences between *mean accruals* for portfolio LOW scaled by lagged total assets and *mean accruals* for portfolio MID scaled by lagged total assets, for sample of observations (A) that have plans with lower but no upper bounds.

  Although accruals here are meant to be TA, he does not distinguish between total accruals and discretionary accruals, since this model by its definitions considers: TA = DA.
- Differences between the mean accruals scaled by lagged total assets for portfolio LOW and portfolio MID, and another for portfolio MID and portfolio UPP, for sample of observations (B) that have plans with both lower as well as upper bounds.
- Differences between mean accruals scaled by lagged total assets for portfolio LOW and portfolio MID, and another for portfolio MID and portfolio UPP, for sample of observations (C) which includes sample (A) as well as sample (B).

Healy's findings indicate significant differences for all of his tests supporting his compensation theory.

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[4] Healy considers two successive years (periods), since he believes that any manipulation in a specific year should be reflected in the second year, that is; no opportunity for manipulation in the same direction for more than one year.

As a matter of fact, the Healy model through conducting pair wise mean accrual comparisons for different types of portfolios that are categorized according to specific partition parameters LOW, MID, UPP, considers one mean accrual of each two compared means as the estimated value (calculated using its observations over a certain estimation period) for what the other mean accrual should be in the absence of earnings management (i.e., the normal mean accrual). Accordingly, the other mean accrual can be seen as the *actual* mean being observed over the *current* or *event* period.

By this, as if Healy considers an implicit assumption for his model that the *predicted* mean accrual represents the non-discretionary (normal) part for the observed mean accrual in the *event* period.

An important feature of this model is that it suffers from neglecting the effect of economic circumstances on the non-discretionary accruals since it considers the non-discretionary accruals as stationary over time, that is, NA= ΔNA= 0.

Consequently, he accounts for the magnitude and direction of manipulation through matching actual total accruals with expected total accruals, as in this way the difference will be inevitably and solely due to discretionary accruals.

3.3.2 The DeAngelo Model (1986)

DeAngelo starts from where Healy (1985) ends. She points out that the Healy model suffers from a major limitation; it indicates a zero benchmark for normal accruals, i.e., the non-discretionary accruals NA is equal to zero at all times, and TA is equal to zero just when there is no manipulation and to DA otherwise.

In the sense that the Healy model considers any value of TA as manipulation, DeAngelo believes that such a model will take a researcher to misleading inferences in two cases: (i) if NA is large relative to total accruals TA and/or (ii) if NA does systematically follow a specific pattern. About the second she believes that NA is systematically negative, and therefore, TA should also be negative.

DeAngelo takes total accruals TA_{t-1} in the period immediately prior to the event period as a benchmark for current accruals TA_t with the implication that a positive (negative) value of the change ($TA_t - TA_{t-1}$) should be understood as income-increasing (income-decreasing) earnings management. Her model considers any value for the change in total accruals as only due to the change in DA ($\Delta TA_t = \Delta DA_t = DA_t - DA_{t-1}$), since she considers the NA part of TA as stationary over time (i.e., ΔNA= zero).

It is important to clarify the difference between the two models regarding this condition; where the Healy considers NA=0 and therefore ΔNA= Zero, DeAngelo (contradictory to Healy) assumes that there is value for NA but further assumes this value is constant over time. Consequently, DeAngelo shares Healy the same assumption: ΔNA= Zero.

It is important to stress the following observations regarding the Healy and the DeAngelo models. (The following discussion draws on a related analysis in Dechow et al. (1995)):

1. While DeAngelo puts forward her model in order to overcome the mentioned limitation in the Healy model assuming NA equal to Zero, her model suffers almost as badly from the same limitation but in different way since she assumes ΔNA equal to zero; generating roughly the same results as Healy's.

   If one considers Healy's definition of manipulation (TA= DA) versus DeAngelo's definition of manipulation as ($\Delta TA = DA_t - DA_{t-1}$ considering NA is stationary), they may think that the Healy and DeAngelo models defining DA as TA and ΔTA, respectively, differ significantly in their implications.

   As a matter of fact this is not the case. Since Healy creates pair wise comparisons of accruals among groups of observations with opposite earnings incentives (i.e., the LOW, UPP, and MID) through observing ΔTA among these groups over period of time covering the study period, it can be concluded that the difference between the two models is not actually in the definition of manipulation [(TA=DA) Healy, against (ΔTA=DA DeAngelo)] since both models eventually measure the same ΔTA, rather than in the *length of the period* over which ΔTA is estimated by each of the models.

The DeAngelo uses TA_{t-1} as the estimated TA (i.e., the DeAngelo model estimates DA over one year), while the Healy model uses more than one year to obtain the estimated TA, in fact, that estimation period is usually equal to the study period.

In sum, while the DeAngelo uses DA_{t-1} as a benchmark for DA_t with an estimation period of just one year. Healy considers the Benchmark TA for a specific group as the average of total accruals (arbitrary, the average of DA) of the other group calculated over the study period.

2. Both models neglect the effect of firm specific economic circumstances on the level of discretionary accruals; since both models effectively fix the non-discretionary accruals part NA.
3. Both models will generate an identical true figure for discretionary accruals (earnings management) in the *event* period, if non-discretionary accruals are stationary over time for both the estimation and event periods, and average discretionary accruals from the *estimation* period is zero. To view this, the general equation for both models is stated:

$$\Delta TA = \Delta DA + \Delta NA \qquad (10)$$

$$= (DA_{event\ period} - DA_{estimation\ period(s)}) + (NA_{event\ period} - NA_{estimation\ period(s)})$$

$$= (DA_{event\ period} - \text{Zero}) + (\text{Zero})$$

$$= DA \qquad (11)$$

<u>And also</u> $= TA \qquad (12)$

3.3.3 The Jones Model (1991)

The model developed by Jones (1991) is used to investigate whether managers of US domestic firms adopted accruals income-decreasing practices to benefit from import relief. As with Healy and DeAngelo, Jones concentrates on the discretionary part of total accruals rather than the discretionary part of a specific type of accruals.

The main difference between this model and the Healy's and DeAngelo's is that it relaxes the assumption of constant non-discretionary accruals implicitly assumed in previous models. Consequently, it is sometimes referred to as *a "firm-specific" expectation model*; in the sense that it allows for changes in *non-discretionary* accruals which are expected to have specific *relation* with the *firm's economic condition.* Jones uses company *revenues* as a proxy for the firm-specific economic condition.

The Jones Model for detecting earnings management is as follows:

$$\mathbf{TA}_{it}/\mathbf{A}_{it-1} = \alpha_i\,[1/\mathbf{A}_{it-1}] + \beta_{1i}\,[\Delta\mathbf{REV}_{it}/\mathbf{A}_{it-1}] + \beta_{2i}\,[\mathbf{PPE}_{it}/\mathbf{A}_{it-1}] + \varepsilon_{it} \qquad (13)$$

Where:

TA_{it} = total accruals in year *t* for firm *i*.

ΔREV_{it} = revenues in year *t* less revenues in year *t-1* for firm *i*.

PPE_{it} = gross property, plant, and equipment in year *t* for firm *i*.

A_{it-1} = total assets at the end of year *t-1* for firm *i*.

ε_{it} = error term in year *t* for firm *i*.

i =1,…, N, number of firms included in the study (in her research N=23).

t = 1,…,T_i, year index for the years included in the estimation period for firm i (For her study T*i* ranges between 14 and 32 years).

Therefore, Ordinary Least Squares is applied to obtain estimates a_i, b_{1i}, and b_{2i} of α_i, β_{1i}, and β_{2i} respectively. And so the accruals prediction error is defined as:

$$U_{ip} = TA_{ip}/A_{ip-1} - (a_i\,[1/A_{ip-1}] + b_{1i}\,[\Delta REV_{ip}/A_{ip-1}] + b_{2i}\,[PPE_{ip}/A_{ip-1}]) \qquad (14)$$

Where p= year index for years included in the prediction period. The prediction error U_{ip} represents the level of discretionary accruals at time p.

Assessment of the Jones model may require considering the following observations:

1 The sign and magnitude of earnings management in terms of discretionary accruals [equivalently the prediction error in equation (14)] is the consequence of matching actual accruals using equation (1) on page 65, and non-discretionary accruals (normal accruals) resulting from applying the fitted equation of the Jones model. Consequently, mistaken estimation of normal accruals will lead to improper estimation of abnormal accruals. A biased estimate of normal accruals can negatively affect judgement on earnings management, that is; an income-increasing (decreasing) earnings management may appear as an income-decreasing (income-increasing) one. The effect of incorrectly estimating normal accruals on evaluating earnings management $\hat{b}$ in Eq.(7) can be easily identified through considering equations [Eq.(2) to Eq.(7)].

2 Therefore, a well-specified (complete) model to detect earnings management must control for all the variables that have influence on normal accruals.

The relevant literature addresses well the issue that for most of the manufacturing and commercial firms (other than banks and the financial institutions) accounts entries such as Accounts Receivables (AR), Inventory (I), Accounts Payable (AP), and Depreciation and amortization (Dep), represent a very fertile area to manage earnings.

The Jones model, as can be seen from equation (13), considers two main variables that have the most effect on the above accruals and the timing of cash flows, these are: revenues and fixed assets.

So, in contradiction to the Healy and the DeAngelo models, the Jones allows for non-stationary normal accruals, hence it considers revenues as a company specific economic condition.

3.3.4 The Modified Jones Model (MJM) Suggested by Dechow et al (1995)

This model is the basic Jones model (1991), but, with a modification suggested by Dechow et al. (1995). It is also the model that is employed by this study. It is therefore important to stress its specifications and highlight its importance in detecting earnings management compared with the other three models.

3.3.4.1 General View of the MJM

The modifications are applied to secure better specification of the model through reducing the high probability of incurring type *II* error that is associated with the Jones Model. Dechow et al. (1995) provide rational reasoning for their adjustment over equation (14) that represents the Jones Model. This reasoning is focused on the implicit assumption in the Jones Model regarding considering all revenues as of non-manipulated source (i.e. non-discretionary accrual source). This condition has the disadvantage that it weakens the Jones model ability to discover manipulation when the later is implemented using revenue-base manipulation. For example, increasing earnings through artificially increasing AR, will increase TA [through Eq.(1)] directly by the induced value of AR and at the same time increase NA by some positive value based on the fitted Eq.(13). Such changes will have the effect of observing less than should be of DA through noting Eq.(14), i.e., producing manipulation less than AR, and therefore leading to incurring type *II* error. To eliminate such a possibility the researchers consider all the non-cash sales change (ΔREC_{it}= Δ in net receivables) of ΔREV_{it} as caused by manipulation. Dechow et al. (1995) point out that "*the original Jones Model implicitly assumes that the discretion is not exercised over revenue in either the estimation period or the event period. The modified version of the Jones Model implicitly assumes that all changes in credit sales in the event period result from earnings management*" (p. 199). And so, it is now time to introduce the Modified Jones Model (1995):

$$TA_{it}/A_{it-1} = \alpha_i\,[1/A_{it-1}] + \beta_{1i}\,[\Delta REV_{it}/A_{it-1}] + \beta_{2i}\,[PPE_{it}/A_{it-1}] + \varepsilon_{it} \tag{15}$$

Therefore, *in the estimation period*, Dechow et al (1995) use the original Jones model (1991) without any modifications, i.e., equation (15) is identical to that of equation (13) with the same definitions of variables.

On the other hand, *in the event period*, the MJM deducts change in net receivables (ΔREC_{it}= ΔAR_{it}) from ΔREV_{it} in equation (14) that represents the *accruals prediction error* in the Jones model. Accordingly, the MJM defines the accruals prediction errors as follows:

$$U_{ip} = TA_{ip}/A_{ip-1} - (a_i\,[1/A_{ip-1}] + b_{1i}\,[\Delta REV_{ip} - \Delta REC_{ip}\,/A_{ip-1}] + b_{2i}\,[PPE_{ip}/A_{ip-1}]) \tag{16}$$

Where:

ΔREC_{it} = net receivables in year *t* less net receivables in year t_{-1} for firm *i*.

The rest of variables are defined as in equations (13) and (14).

Dechow et al. (1995), evaluate the relative effectiveness of the competing models (including their model) to detect earnings management, by comparing the *specification* and *power* of the commonly used test statistics. They account for the test specification by observing the frequency by which these models individually create type *I* error. On the other hand, the power of the test is evaluated by observing the frequency by which each of these models generates type *II* error[5].

They conduct *four* different tests to determine best model in detecting earnings management, *defined* as the model that produces the lowest type *I* and *II* errors. Designing four distinct sample designs facilitates their tests. For a specific test they choose a specific sample of firms

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[5] A common procedure when testing a statistical hypothesis is to differentiate between two mutually exclusive hypothesises, they are; the null hypothesis that represents a statement about a population parameter, usually represents a statement that is suggested to be disproved. The second type is the alternative hypothesis that is required to be established. Deciding on one of the above hypotheses as being most likely to reflect the population parameter is not often taken as in an absolute manner rather than in accordance with an accepted level of committing specific error (i.e., α, level of significance of committing type *I* error).

Two types of error can occur as a result of carrying out any statistical hypothesis test, these are; the first is type *I* error, which is said to occur if the test rejects the null hypothesis (H_o) when H_o is true. And the second is type *II* error, that occurs if the test accepts H_o when it is false (equivalently, when the alternative hypothesis H_1 is true), Sheldon (2005).

In symbols, the probability of committing a type *I* error is α (the level of significance), and if it is the case, then this implies that the probability of not committing this type of error is [1− α] (i.e., the confidence coefficient). At the same time, the probability of not committing a type *II* error is [1−β] (i.e., the power of the test), when committing this type of error is (β). Gujarati (1992).

In the same context, Al-E'toom and Al-A'rory (1995), emphasize that the ideal situation is that one in which both kinds of error are at their minimum. They add that, for a given sample any decrease in a specific type error is always matched by an increase in the other, and vice versa, any increase in a specific type error will be matched by a decrease in the other, and that the only possible way of reducing both types of error is through increasing the sample size. (p.p. 309- 310)

According to Dougherty (1992), the lower the critical probability (α), the smaller is the level of risk of committing a type *I* error, that is the lower this probability the safer the test is concerning not committing the first type error (safer; since an α of 1% rather than an α of 5% means accepting the level of rejecting true hypothesis 1% of the time rather than 5% of the time), and so the 1% is described as higher than the 5%.

On the other hand, the lower α, the smaller is the possibility of rejecting the null hypothesis, and therefore the higher is the probability of committing a type *II* error (i.e., in case the statement of the null hypothesis happens to be false). That is why Dougherty (1992) adds, "*thus you are caught between the devil and the deep blue sea. If you insist on a very high significance level, you incur a relatively high risk of type II error if the hypothesis happens to be false. If you choose a low significance level you run a relatively high risk of making a type I error if the hypothesis happens to be true*" (p. 96).

that share strong common expectation of *having* or *not having* managed earnings, as described below. Consequently, rejecting H_0 of no earnings management for a sample of firms that are strongly believed to not have managed earnings will mean incurring type *I* error. On the other hand, accepting H_0 of no earnings management for a sample of firms that are positively believed to have managed earnings will mean incurring type *II* error.

Dechow et al. (1995) start their empirical work considering the null hypothesis of no earnings management for each sample portfolio through calculating *average* '*t-statistic*' for the shares that constitute the sample. A value of *zero* for that average for a specific portfolio refers to the case of *no* earnings management (accepting the null hypothesis).

The researchers also, evaluate how much a model is *risky* by running *'t-tests'* for each sample portfolio when the null hypothesis is 'no earnings management' (i.e., $\beta = 0$) considering the coefficient $\hat{b}$ on PART in equation (7) section 3.2.1 of this chapter, as the 'point estimator' of the magnitude of earnings management in the real population β that resulted from the stimulus PART.

For example, for a sample of firms that *have not* engaged in earnings management practices, the researchers measure the average of type *I* error (i.e., rejecting a true hypothesis) attributed to a specific model *as* the *frequency* with which that model generates that type error. For such a sample if a model generates relative frequency of type *I* error significantly *higher* than that specified by the test level(s) of significance (eg., 5%, 1%), then it will be considered by the researchers as *risky*, more specifically, risky relative to generating high levels of *type I errors*.

On the other hand, for a specific sample of firms that have *engaged* in manipulation practices, if a specific model generates frequencies of rejection to the hypothesis (no earnings management) significantly *less* than or *equal* to specified by the test level(s) of significance (eg., 5%, 1%), then such a model will be considered *risky*, relative to generating high levels of *type II errors*.

In summary, the researchers evaluate each model individually according to its ability to *accept (reject)* the hypothesis when the sample portfolio (i.e., the evidence) *supports (contradicts)* the hypothesis, respectively.

This implies that the procedure employed to build the four sample portfolios is a crucial issue; since each sample portfolio is required to tell precise information regarding if it contains manipulation or not, so as to later, be able to judge each model according to its *ability/inability* to discover earnings management.

If earnings of a sample portfolio are designed to be managed (unmanaged), then a good (i.e., less risky) model of earnings management should discover this manipulation (no manipulation) through rejecting (accepting) the hypothesis, since the hypothesis is designed to refer to no earnings management, that is: β=0. Rejecting (accepting) such a hypothesis by a specific model happens when that model significantly produces rejection frequencies higher (equal to or less) than the accepted by a researcher level(s) of significance. Consequently, this will lead to low levels of *type II* (*type I*) errors, respectively.

On the other hand, if earnings of a sample portfolio are designed to be managed (unmanaged), then a bad (i.e., risky) model of earnings management may not discover this manipulation (no manipulation) and therefore, accepts (rejects) the hypothesis, when the hypothesis is designed to refer to no earnings management, that is: β=0. This happens through significantly producing rejection frequencies equal to or less (higher) than the accepted by a researcher level(s) of significance. Consequently, this will lead to experiencing higher levels of *type II* (*type I*) errors than the case actually requires, respectively.

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3.3.4.2 What Reasons can Cause an Earnings Management Model to Generate Type *I* and *II* Errors Rather than It should be? (What Makes a Model Risky/Less Risky?)/ A Statistical Emphasis

The following discussion requires recalling the general earnings management regression described earlier in *Eq.(7)* on page 69. Dechow et al. (1995) identify three possible statistical problems that obstruct making rational inferences about earnings management, put differently; the researchers define three problems that lead to false inferences regarding hypothesis testing of earnings management. These problems are:

The First problem. Incorrectly attributing earnings management to PART, i.e., $\hat{b}$ in Eq.(7) should be zero while the results show a *non-zero* value, because of omitted explanatory variable(s) that is(are) correlated with PART[6+7].

More specifically, if the sign of correlation between the omitted explanatory variable (the case of one omitted variable) and PART is the same as of the sign of the slope coefficient of regressing the dependent variable on the excluded explanatory variable [as if both of the explanatory variables; PART and the omitted variable, are included in the equation], $\tilde{b}$ will be upwardly biased referring to income-increasing earnings management. This implies increasing the possibility of rejecting the hypothesis, since as was mentioned before; a specific overestimation of $\hat{b}$ can lead to rejection of a true hypothesis, and therefore, creates a type *I* error. [For better understanding, please refer to section 3.2.1 of this chapter].

The Second problem. Unintentionally extracting earnings management caused by PART. This happens when there is earnings management [i.e., $\hat{b}$ should be any value rather than zero],

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[6] Note that effect of omitting explanatory variable(s) that ought to be included in the regression on hypothesis testing is thoroughly discussed in section 3.2.1 of this chapter.

[7] Dechow et al (1995) stress that earnings management is correctly spotted but incorrectly attributed to PART if the omitted variable was any variable rather than the measurement error in PART. (p. 196).

while results conclude a zero value of $\hat{b}$.

Since the researchers in Dechow et al 1995, investigate how specified a model is in respect to this problem through using two sample portfolios, each consists of firm-years with actual income-increasing practices, one should think about what possible reason(s) is(are) there to cause a downward bias in $\hat{b}$ towards zero. In general, for samples with income-increasing manipulation, if the sign of correlation between the omitted explanatory variable and PART is opposite to the sign of the slope coefficient of regressing the dependent variable on the excluded explanatory variable [as if both of the explanatory variables (PART and the omitted variable) are included in the equation], $\hat{b}$ will be downwardly biased towards zero. A specific underestimation of $\hat{b}$ can lead to accept a false hypothesis, creating type *II* error.

The Third problem. Low power test. This occurs if the regression omits variables correlated as well as uncorrelated with PART. Since in such a case the standard error of $\hat{b}$ will be biased upwardly [i.e., the standard error of the coefficient of the included explanatory variable in the misspecified equation, say Eq(7)]. Overestimation in se($\hat{b}$) will increase the accepting region in the confidence interval estimation approach to hypothesis testing, leading to accepting the hypothesis. Expressed another way, overestimation in se($\hat{b}$) will decrease the measured '*t*-statistic' in the *test of significance approach* to hypothesis testing, leading to accepting the hypothesis whatever the hypothesis is (please, consider section 3.2.1 in this chapter). If the hypothesis happens to be false this will create type *II* error. (Type *II* error was emphasised in footnote 5 in this chapter)

3.3.4.3 How Samples are Formed in the Dechow et al. (1995) Study? And Why?

The researchers form four different samples of firm-years. The first and the second are not expected to include earnings management since the observations are *randomly* selected.

Therefore accepting (rejecting) the hypothesis from any of the models for (for any of) these two portfolios will mean that this model isn't (is) risky in detecting earnings management, respectively. Measuring the risk associated with any model, when the first or the second portfolio is used, depends on the level of type *I* error generated by that model, measured as the frequency with which the model *rejects* a *true* hypothesis (a true hypothesis since the portfolios here are *randomly* selected and should therefore be free from significant manipulation).

On the other hand the third and the fourth sample portfolios were designed to include earnings management, i.e., earnings are *actually* managed, and so accepting (rejecting) the hypothesis from any model for any of (for) these two portfolios will mean that this model is (isn't) risky in detecting earnings management. As a matter of fact these two portfolios investigate how risky the models are, through considering the generated type *II* error as measured by the frequency a model *accepts* a *false* hypothesis.

The Four Samples Are:

The First Sample. A randomly selected sample of 1000 firm-years. This is selected from 168771 firm-years on the COMPUSTAT industrial files covering the period 1950- 1991. The important feature of this sample is that it is chosen in every aspect at random. Put differently, the earnings management partitioning variable PART is selected at *random*, which means it is expected to be *uncorrelated* with any omitted variables. Such samples differentiate among the different models relative to *problem number (3)* [section 3.3.4.2]. *In general* this problem leads to *increasing* the probability of *accepting false* hypothesis, and therefore, generating type *II* error. But, since the sample here is designed *at random*, where no systematic earnings management exists, any significant '*t*-test' values for that sample will represent type *I* error. The *t*-test for this sample *as well as* for the second sample requires observing the generated by models levels of type *I* errors *in comparison* with the specified test level(s) [5% , 1%, etc.]. The considered *t*-test examines the hypothesis (H_o: Earnings management = 0) through its one-tailed test hypothesises, that is; through testing the hypothesis (H_o: Earnings management ≤ 0) and the hypothesis (H_o: Earnings management ≥ 0), *for the purpose* of knowing the *direction* of earnings management, if any. The hypothesis may be *accepted* if the incidence of type *I* error is *less* than or *equal* to the specified test level of significance [i.e., when: type *I* error is $\leq \alpha = 5\%$ or 1%, whichever is used], while it may be *rejected* otherwise. A *binomial* test is also employed to assess whether the *difference* between the generated by models type *I* errors and the used test level(s) is *significant*. Statistically, when the generated type *I* error is *higher* than the specified test level *and* the difference is *significant* we may *reject* the hypothesis in favour of accepting the alternative, and other wise, we may accept the hypothesis.

The Second Sample. Samples of 1000 firm-years that are *randomly* selected from pools of firm-years experiencing extreme financial performance. Firm performance is defined in two ways; the first is when firm-years have extreme *earnings* performance, and the second when firm-years have extreme *cash flows* from operation performance. Firm-years were arranged according to each measure of performance from the lowest to the highest resulting in ten deciles for each measure. 1000 firm-years observations are randomly selected for each measure of performance for each of the highest and lowest deciles, resulting in four *minor* samples. This sample is created to test the specification of different models when the earnings management partitioning variable PART, is *correlated* with *firm performance*. Put differently, to examine the effect of firm performance on models' specifications. A randomly selected sample differentiates among the different models in accordance to *problem number (1)* through investigating the relative frequency with which each model generates significant type

I error.

The researchers observe the type *I* errors generated *in comparison* with the specified test level(s). As mentioned earlier, the *t*-test conducted here examines the hypothesis (H_o: Earnings management = 0) through its one-tailed test hypothesises, that is; through testing the hypothesis (H_o: Earnings management ≤ 0) and the hypothesis (H_o: Earnings management ≥ 0), *for purpose* of knowing the *direction* of earnings management, if any. As a matter of fact, the *t*-test requirements and implications for the second sample portfolio are exactly the same as of those for the first sample portfolio.

The Third Sample. Samples of 1000 randomly selected firm-years in which a *fixed and known amount of accrual manipulation has been artificially introduced.* This sample is designed to measure the relative frequency with which the models generate type *II* error. Here, the test requirements are *exactly opposite* to those for the first and second samples, since the first and the second samples are designed to test type *I* error. That is, as long as earnings of these firm-years are *actually managed*, then a model with t-statistic less than or equal to the determined level(s) of significance (contradictory to reality, refers to *no earnings management*) will be considered risky leading to accepting a false hypothesis H_o, and therefore, generating a type *II* error.

Two main assumptions are made to construct these samples:

The *first* assumption concerns components of accruals that are managed. This includes two different minor assumptions:

1. *Expense manipulation.* Delayed recognition of expense. This is done by adding specific amount of expense manipulations to total accruals TA in the earnings manipulated year (designated as *year '0'*).

2. *Revenue manipulation.* Premature recognition of revenues when considering:

- *Costs are fixed.* The assumed manipulated amount is added to total accruals, revenues and accounts receivable in *year 0.*
- *Margin manipulation.* When all costs are variable. Here an increase in earnings management (accruals) needs more increase in revenues and accounts receivables in *year zero*, depending on the *margin percentage.*

The *second* assumption concerns timing of reversing manipulation. Which is hypothesized to be in the following year to year 0 (i.e., *year 1*), through adopting *exactly opposite* manipulation procedures to those in year 0.

About the revenue manipulation, the researchers point out that the related mentioned two minor assumptions are extremes to what happens in the real life.

The Fourth Sample. A sample of 32 firms that are subject to *SEC enforcement actions* for allegedly overstating annual earnings in 56 firm-years, through violating the GAAP. From these: 15 firms were accused of overstating revenues, 14 firms were targeted of reducing expenses, and three firms of combining overestimating revenues and underestimating expenses.

Needless to say that this sample evaluates specifications of the models regarding generating type *II* error.

Figure 3.1 summarises the Dechow's et al. (1995) three possible problems that can result from omitting relevant explanatory variable(s) from the earnings management model, the samples formed to test the specifications of the competing models in response to the mentioned problems.

3.3.4.4 Dechow's et al. (1995) Findings

Findings for the First Sample

They find that all the models; Healy, DeAngelo, Jones, and the MJM suggested by the researchers appear to be well specified, that is; none of them produces biased estimation $\hat{b}$ of the population parameter β, and therefore, all the models generate average '*t*-statistic' close to zero.

It is found that none of the models generates type *I* error *significantly different* than the used two levels of significant 5% and 1%, that is; each of the models produces type *I* errors *significantly similar* to the hypothesized by researchers under the distribution't'. Put another way, the models generate similar levels of risk to those accepted by researchers regarding rejecting true hypothesis (type *I* error).

On the other hand, it is found that *none* of the models produces *powerful* tests for earnings management of an economically plausible magnitude (p. 204). About this issue the Jones Model and the MJM produce the least standard deviation of 9%, which implies that earnings management should exceed 18% of the lagged total assets to produce t-statistic of at least 2 (18% divided by 9%), and therefore, to statistically be observed by these models. The highest standard error is 28% for the DeAngelo Model.

Findings for the Second Sample

As mentioned earlier we start with the case when performance is described as earnings, then when performance is described as cash flows from operation. The test concerns conducting *t*-test for the generated (by models) levels of type *I* error.

A) <u>When Financial Performance is Defined as Earnings</u>

Dechow et al. (1995) find that the models are unable to consider implications of the firm-specific earnings performance. More specifically, the results on the average indicate significant income-decreasing manipulation for the lowest decile, and significant income-increasing manipulation for the highest decile.

It is worth clarifying that a good interpretations of this misspecification should consider the first problem [i.e., problem (1) in section 3.3.4.2]. The researchers relate the high levels of rejection to the hypothesis of no earnings management for the *lowest* as well as the *highest earnings* performance deciles to the normal expected *positive* relation between *earnings* and *total accruals*.

B) When Financial Performance is Defined as Cash Flows from Operations

All four models reject the null hypothesis of no earnings management for the lowest as well as the highest cash flow deciles at the 5% and 1% levels of significance. Firms with low cash from operations are found to have experienced income-increasing accrual manipulation. On the other hand, firms with high cash flow from operations are found to have managed income-decreasing accruals. More specifically, the researchers find evidence that the models are incapable of considering implications of earnings *smoothing* over time when managers choose to manage earnings through altering the accrual system in opposite direction to that of cash flow.

Dechow et al. (1995) state that the four models were found misspecified because the stimulus PART under investigation is *negatively correlated* with cash flow performance. Their findings come across Dechow's (1994) who emphasises that operating accruals tend to behave towards smoothing violations in cash flows, that is; a higher than expected accruals for low cash flow firms can be caused by reasons relating to smoothing rather than manipulation, and a lower than expected accruals for high cash flow firms can be motivated by smoothing purposes, before any thing else.

Findings for the Third Sample

Two main issues are investigated by this sample. The first concerns how successful the models are in producing *unbiased* estimates of earnings management (unbiased estimate by a model means *generating earnings management* by that model *exactly equal* to the *induced* manipulation). This mission is facilitated since the researchers themselves manipulated operating accruals of firms in this sample.

The second issue concerns the relative power with which each model detects manipulation. The *relative power* can generally be viewed as the relation between the relative *frequency of rejecting the null hypothesis* (since manipulation is confirmed for the firms in this sample) and the *magnitude of the induced manipulation.* A model with higher frequency of rejection to a false hypothesis is preferred to a model with less frequency, since such a model is more sensitive and effective in rejecting the null hypothesis of no earnings management per the one unit of real manipulation.

Concerning the first issue, except for the Jones, the models produce roughly unbiased estimates of the induced manipulation. The Jones model and as the researchers predicted produces unintentionally *downward* biased estimates of manipulation (abnormal accruals) by about 25 % and 33% for the revenue manipulation the case of fixed costs and the revenue manipulation the case of the margin, respectively.

With regard to the second issue, the relative power, the models can be arranged from the highest to the lowest as follows: the MJM comes directly before the Healy Model as mainly because the Healy's has slightly higher standard error. Then, the Jones model which has not been found of relatively high power despite having the least standard error because it biases estimation of real manipulation downwardly, comes as a third place. Finally, the DeAngelo model comes at the last as it produces the highest standard error.

Findings for the Fourth Sample

Dechow et al. (1995) plot the average median accruals, average median cash flows and average median earnings, all deflated by total assets, for that sample against the same variables of a randomly selected sample of 1000 firm-years, over 11 years centred by the year '0'.

Results for the fourth sample do not differ significantly from those for the third sample. A *high upward increase in accruals* was observed just before and close to year '0' for the sample firms, the issue that has been explained by the researchers as to '*mask*' the dramatic *decrease in cash flows* from operations for those firms in the same period. It is also found that while the Jones and MJM are the best in explaining the accruals behaviour in terms of volatility since they have the least standard errors, all models are capable of discovering the proposed by SEC manipulation according to the following arrangement: the MJM is the best, then the Healy Model, followed by Jones Model, and finally the DeAngelo Model.

This arrangement is based on how powerful a model is in detecting earnings management. As in the previous test, the researchers attribute the low power of the Jones model mainly to the tendency of that model to estimate revenue-based manipulation downwardly.

3.3.4.5 Bowman and Navissi (2003) Investigate the Validity of the MJM

Bowman and Navissi (2003) investigate the construct validity of the MJM after the introduction of price control regulation in New Zealand in 1970 and subsequent changes in 1971 and 1972.

A Price Freeze Regulation (PFR) that influenced prices of all goods and services was first introduced in November 1970 with the declaration that a new regulation in January 1971 would follow to allow manufacturing firms to apply for price increases. The January 1971 regulation introduced the price justification scheme (PJS) that allowed only part of the manufacturing firms to have the opportunity of increasing their prices. Manufacturers of basic commodities were allowed to increase their prices if they managed to prove a financial hardship. A third regulation followed in March 1972, the stabilisation of prices regulation (SPR), which included the possibility to apply for the price increase for both; the basic and non-basic commodity manufacturers (i.e., the basic firms for a second time and the non-basic firms as a first time).

The researchers propose that both types of firms that are included in the above price regulations plan will suffer from wealth losses in November 1970 and just the second type in January 1971. Moreover, they hypothesise that while the basic firms have income-decreasing accruals incentive for the years 1971 and 1972, the non-basic firms have similar incentives for only the year 1972. Finally and most importantly, Bowman and Navissi propose that the more wealth shrunk in Nov. 1970 and Jan. 1971, the more aggressive earnings management through accruals will be.

Consequently, the argument is that, if the MJM is valid and reliable, it should capture any manipulation that has become expected after being spotted by the market.

Using a market based model, the researchers computed abnormal returns over short-time windows around the price control regulations during (1970-1972) for a sample of 55 firms listed on the Official Record of Stock Exchanges of New Zealand, consisting of 29 basic and 26 non-basic firms.

Then, they estimate the MJM accrual prediction errors. Their findings indicate that the MJM is reliable and valid since it significantly adjusted the accruals prediction errors (i.e., abnormal accruals) in sign and magnitude relative to what was expected by the market.

3.4 What are the Main Areas of Variations among Researchers Regarding the Way They Employ the MJM?

In real life researchers vary in the way they employ the MJM as a tool to separate total operational accruals into its normal and abnormal parts. While the variations may have small impact on estimated abnormal accruals in some cases, it is likely to have impressive effects in others. Though we do not intend to be so inclusive or detailed in making comparisons among different applications of the MJM, we account in this section for the most important features of that variation:

First: The MJM that has been emphasised so far is firm-specific time-series model. As has been shown such a model uses firm-specific historical time-series accounting data from the estimation period to calculate expected abnormal accruals in the event period. Time-series MJM has received criticism from many researchers as the model estimates abnormal accruals with considerable imprecision. As was mentioned in the previous section, Dechow et al. (1995) themselves document that their model is of low power when applied to a random sample of companies, and does not appear well specified when applied to a random sample of companies with extreme financial performance defined as both; earnings and cash flows. Subramanyam (1996) indicates that the cross-sectional Jones and Modified Jones Models are superior to their time-series counterparts in terms of number of sample observations available and power of tests (p. 254). We summarise what has been advanced to be against the firm-specific time-series models (in general):

- Firm-specific models require long periods (i.e., time-series) of firm's accounting observations (i.e., up to 14 years) to allow for effective estimation, which will reduce number of firms included in the sample. DeFond and Jiambalvo (1994), Chai and Tung (2002), and Zhong et al. (2007).
- The need for long-time series of data creates survivorship bias, Gietzmann and Ireland

(2005). Pae (2005, p. 21) points out "*The long time series data requirement entails survivorship bias; therefore, inferences drawn from empirical tests may not be generalized to young and unsuccessful firms*". Similar inferences by all of Peasnell et al (2000), and Peasnell et al (2005), Saleh and Ahmed (2005). Also, according to Jeter and Shivakumar (1999, 301) time-series models suffer from severe survivorship bias as well as selection bias.

- Firm-specific time series models assume that coefficients are stable across years. Jones (1991), Young (1999), Abbott et al. (2006), and Kwon et al. (2006).
- Finally, time-series models impose a situation of no systematic earnings management during the estimation period, Jeter and Shivakumar (1999). This overlapping between estimation and treatment periods lowers the power of detecting earnings management using time-series models, Subramanyam (1996, p. 254).

Accordingly, many researchers [most prominently DeFond and Jiambalvo (1994), Subramanyam (1996), and Becker et al. (1998)] employed the Jones and Modified Jones Models in their studies on cross-sectional basis (instead of the original or standard time-series basis). They acknowledged these models as being able to overcome all problems associated with the time-series (i.e., original) ones. We hereby, clarify how the cross-sectional MJM works in practice.

To estimate the abnormal accruals part of total accruals for a firm i in year t researchers construct industry-event (i.e., industry-year) period match portfolio. Eq.(15) is regressed using accounting data for all the firms in the same industry-year as firm i. Then, the estimated coefficients are applied to all the firms in the same industry-year including firm i to estimate individually firms'-specific normal accruals that will be matched with actual total accruals to estimate abnormal accruals through employing Eq.(16). One should clarify, that the only difference between cross-sectional and time-series MJMs is in the first stage that includes coefficients' estimation; and not in the accounting data used nor in the process of matching actual total accruals with estimated normal accruals to estimate the residual i.e., abnormal accruals. Estimation of normal accruals and the matching process take place on the firm-specific level. That is, in the second stage of estimating abnormal accruals the cross-sectional and time-series models are the same. For example, instead of using firm-specific data for 15 historical years for firm i in year t to estimate actual parameters (α_i, β_{1i}, β_{2i}) in Eq. (15) under firm-specific time-series MJM, a researcher will obtain the accounting data needed to run the same regression from all the companies in the same industry as of the firm i in year t under the cross-sectional application of the MJM. This implies that while the estimation period under the time-series case is 15 years with one observation for each year, the estimation period for the cross-sectional case is just one year with a number of observations equal to the number of companies in the same industry as of firm i in year t minus one (note that researchers often exclude firm i itself from the industry-match portfolio as it is hypothesised to include possible discretion).

The cross-sectional basis for estimating abnormal accruals is hypothesised to have the potential of avoiding the four problems associated with time-series models, enhance the efficiency with which coefficients' parameters are estimated through the ability of using more observations for the one regression, and finally, and as Ahmed et al. (2005, p. 332) address removes any common industry factors that affect accruals. Examples of those who employ cross-sectional models: (i) employ the Jones (1991) model on cross sectional basis [Chan et al. (2004), Noguer and Munoz (2004), Tendeloo and Vanstraelen (2005), García Lara et al. (2005), and Burgstahler et al. (2006)], and (ii) employ the MJM (1995) on cross-sectional basis [Teoh et al. (1998a, 1998b), Chung and Kallapur (2003), Baker et al. (2003), Cheng and

Warfield (2005), and Davidson et al. (2005)].

While the cross-sectional approach has potential advantages, it also has potential problems:

- Cross-sectional models suffer as they assume that firms in the same industry have similar expected accruals (i.e., homogeneity across firms in the same industry), e.g. Larcker and Richardson (2004, p. 633), Gietzmann and Ireland (2005, p. 614), and DeFond, and Jiambalvo (1994, p. 158). Pae (2005) finds evidence that firms used to estimate the cross-sectional abnormal accruals have higher earnings than the violation firms *(violation firms here are the firms being proposed to have managed earnings).* He notifies that this raises the question as to whether the cross-sectional models are relevant for the violation firms. Also, he adds "*if each firm has its own firm-specific expected accrual patterns, the original time-series Jones model may produce a better measure of unexpected accruals*", (p. 9). Gu et al. (2005, p.314) document individuality aspects among different firms regarding their accruals' specific behaviour "*We show that the accrual variance depends on many factors and is systematically different across firms*".
- More importantly, reversals of accruals are a firm-specific time-series property, e.g., Pae (2005, p. 9). Peasnell et al. (2000, p. 315) point out that cross sectional models are less likely to capture the effects of mean reversion in accruals. This point constitutes a crucial limitation to cross-sectional models. As has been advanced before, firms' earnings on the long run are equal to their cash flows, Jones (1991). Since companies can not continue managing their incomes in the same direction, they keep changing the direction of their discretion over time. Any successful (i.e., well-specified) model to separate total accruals into its normal and abnormal parts should include as much as possible all firm-specific accruals so as to consider implications of reversals of

accruals on estimating the normal part of total accruals. Young (1999, pp. 8-10) documents that: (i) cash flow performance [being negatively correlated with accruals, eg. Dechow et al. (1995)], (ii) growth rate [firms with different growth rates have different implications of accruals; firms experiencing growth (decline) in their operating activities are positively (negatively) correlated with working capital accruals, supporting evidence that of Sloan (1996)], and (iii) fixed assets structure [fixed assets intensity and rate at which firms choose to depreciate their fixed assets] are very important factors in determining the level of normal accruals and therefore should be taken into account as explanatory variables in a well specified earnings management model. And so, the question arises is: *to what extent these non-discretionary factors are firm-specific or industry-wide in their nature?* In similar context, Mitra and Cready (2005 p. 267), believes that factors such as growth, profitability, and structural changes that affect time-series models should be accounted for when applying cross-sectional models, and so they do trying to develop well-specified cross-sectional model.

- Sectional models are less likely to capture the effects of industry-wide earnings management, e.g. Peasnell et al. (2000) and Jeter and Shivakumar (1999).

While evaluating the cross-sectional Jones (1991) model as an alternative to its time-series counterpart, Jeter and Shivakumar (1999, p. 318) clarify that though cross-sectional models can be highly useful for researchers examining *event-specific* earnings management as they provide industry-relative measures of abnormal accruals, they are not true substitutes for time-series models. Also, according to Peasnell et al. (2000), "*one should not interpret the current preference for cross-sectional models in the literature as evidence of their improved ability to detect earnings management*", (p. 315). And with opposite preference Dechow and Dichev

(2002) stress that "*we expect that a firm-level specification is superior to cross-sectional specifications because the regression coefficients are likely to differ across firms*", p. 44).

Second: Researchers vary in application of the MJM regarding considering potential sales earnings management within the estimation period. It is worth noting that the original time-series MJM has been proposed with no earnings management during the estimation period, that is; the Jones (1991) and MJM models are identical according to Dechow et al (1995) for the first stage of the model (i.e., coefficients' estimation period). In other words, the MJM uses the Jones (1991), i.e., Eq.(15) to estimate (a_i, b_{1i}, and b_{2i}). In fact, Dechow et al. (1995) use parameters estimated by the Jones (1991) model in the pre-event period for each firm in their sample, and apply those to a modified sales change variable defined as (change in sales minus change in receivables) to estimate discretionary accruals in the event period through employing Eq.(16). Examples of studies that adopt this methodology are: Marquardt and Wiedman (2004), Peasnell et al. (2005), Johnston and Rock (2005), Bergstresser and Philippon (2006), and Lobo and Zhou (2006). This treatment regarding eliminating the possibility of earnings management during the estimation period has been taken particularly against the time-series models as has been shown, e.g. Subramanyam (1996), and Jeter and Shivakumar (1999). As a matter of fact, accurate estimates of normal and abnormal accruals require taking into consideration the possibility for revenues to be managed during the estimation period. In time-series application such problem can be avoided by adjusting revenues in the estimation period by receivables in the same way as it is done in the event period, and in cross-sectional approach this can be achieved by excluding the firm intended to be investigated from the industry before the industry-match regressions take place. From another aspect, Kang and Sivaramakrishnan (1995, p. 353) stress that methodological issues arise in part because the variables most useful in predicting the unmanaged components are themselves accounting numbers which are vulnerable to be affected by earnings management. Further, Kothari et al. (2005, p. 174) clarify that not considering receivables in the estimation process "*is likely to generate a large estimated discretionary accrual whenever a firm experiences extreme growth in the test period compared to the estimation period*". Kothari et al. (2005) support their point of view by findings of Teoh et al. (1998b), and Loughran and Ritter (1995) who document high sales growth for their IPO and new firms, respectively. We can add by saying that this argument seems to have its background by findings of Sloan (1996) and Young (1999) who indicate that firms with high growth rates are positively correlated with working capital accruals. As most of those firms' sales growth rates are expected to be through receivables, then a good model for estimating normal accruals should consider receivables as an explanatory variable in the estimation process even if no earnings management is to take place within estimation periods. To consider receivables REC in the estimation period using the MJM, Eq.(15) on page 80 will be represented as follows:

$$\mathbf{TA}_{it}/\mathbf{A}_{it-1} = \alpha_i\,[1/\mathbf{A}_{it-1}] + \beta_{1i}\,[(\Delta\mathbf{REV}_{it} - \Delta\mathbf{REC}_{it})/\mathbf{A}_{it-1}] + \beta_{2i}\,[\mathbf{PPE}_{it}/\mathbf{A}_{it-1}] + \varepsilon_{it} \qquad '(15)$$

<u>Third</u>: researchers vary in the method they use to calculate total accruals. Following Hribar and Collins (2002) who indicate that material items like mergers, acquisitions, and divestitures are likely to create abnormal accruals measurement errors if total accruals are computed using the balance sheet [i.e., by applying Eq(1)], many studies employed an income statement approach as an alternative to the balance sheet approach to compute total accruals which will be decomposed into normal and abnormal parts. Under this approach accruals are defined as the difference between earnings (before extraordinary items and discontinued operations) and cash from operations. Examples are: Chung, and Kallapur (2003), Reynolds, et al. (2004), Bedard et al. (2004), Menon, and Williams (2004), Nagy (2005), and Cahan and Zhang (2006).

On the other hand, there is a considerable body of research that computes accruals through employing Eq. (1) [i.e., the balance sheet method] because no cash flow statements were required or prepared over their study periods, or even because they do consider limitations of the cash flow method such as Gore et al (2007) who emphasise "*In any case, measuring total accruals using the cash flow statement, which is the approach preferred by Collins and Hribar (2002), is itself not unproblematic. The difference between operating profit and operating cash flow usually includes a number of idiosyncratic accruals that cannot be classified systematically as either discretionary or non-discretionary*", (p. 128). Examples of studies calculate total accruals using balance sheet approach are: Heninger (2001), Gul et al. (2003), Chan et al. (2004), Kothari et al. (2005), Gu et al. (2005), and Bergstresser and Philippon (2006).

Fourth: some researchers consider total operating accruals, while others consider current operating accruals [i.e. total operating accruals minus long-term accruals (depreciation and amortisation expense)] as the dependent variable in regression equation [i.e., say the regression Eq.(15)]. According to the majority of earnings management literature that has been done so far, researchers use total operating accruals -defined as the change in non-cash working capital accounts minus depreciation and amortisation- as the dependent variable in their regression model. Examples of studies use total accruals and the balance sheet approach are [Matsumoto (2002), Abarbanell and Lehavy (2003), Balsam et al. (2002), Bhattacharya et al. (2003), and Ball and Shivakumar (2006)]. Examples of studies use total accruals and the income statement approach are [Wang (2006), Barton (2001), Cahan and Zhang (2006), Ashbaugh et al. (2003), and Guay (2006)]. On the other hand, there is number of researchers who argue that current operating accruals (or as they refer to by working capital) improves the models' ability to estimate non-discretionary accruals. Bradshaw et al. (2001) suggest that working capital accruals (i.e., current operating accruals) "*do a better job than total accruals of capturing the accruals that lead to earnings reversals that are unanticipated by investors*", (p. 51). According to them, exclusion of such items as depreciation of plant and amortisation of debt (premium/discounts) can be justified as these factors tend to remain fairly constant over time and account for little variation in total accruals. Sloan (1996) reports that most of the variation in total accruals is driven by current accruals, and more specifically, by movements in receivables and inventories. Mitra and Cready (2005) point out that "*it is easier for managers to manipulate current accruals relative to long-term accruals because they can exercise greater discretion over the choice and application of accounting techniques with regard to regular revenue and expense items*", (p. 264). Examples of studies using working capital as the dependent variable in the regression equation are [Young (1999), Peasnell et al. (2000), and Peasnell et al. (2005)]. It is worth noting that if a researcher uses working capital as alternative to total accruals, then they have to exclude the variable '*Plant, Property, and Equipment (P.P.E)*' that was used as a regressor in the earnings management model in the case of total accruals as a dependent variable.

Fifth: How do researchers often estimate the intercept α in Eq.(15)? In general there are two methods. Most researchers deflate α by lagged total assets exactly in the same way they deflate other dependent and independent variables in Eq.(15), then they run their time-series or cross-sectional regressions considering the fraction $[1/A_{it-1}]$ as one of the explanatory variables in the regression. On the other hand, few researchers consider value of the whole term (α_i $[1/A_{it-1}]$) in Eq.(15) as the value of intercept (i.e., the constant). Estimated value using this alternative will have already incorporated the effect of the fraction $[1/A_{it-1}]$ for normal accruals estimation purposes. Note that one may think of two advantages for the second method: (i) according to the related theory on which the Jones (1991) and the MJM is originally based there are two normal accruals drivers (i.e., Rev. and P.P.E) none of them is the lagged total assets, i.e., the fraction $[1/A_{it-1}]$. Indeed, even though the people who adopt the first method do not mean treating the lagged total assets as an explanatory variable more than a method for intercept estimation purposes, but they do. (ii) Because there is positive correlation between total number of observations required and number of explanatory variables in a regression, by considering more explanatory variables in the regression more observations are needed to sustain minimum level of accuracy with which parameters are estimated. Peasnell et al. (2000, p. 316) stress that "*As such, the s-J and m-J models reported in this paper differ slightly from those estimated in extant studies where the intercept is also scaled by total assets and the resulting regression is estimated with the true constant term suppressed. We did not adopt this approach in the current paper for two reasons. First, there is no theoretical reason for forcing the regression through the origin (e.g., we have no reason to believe that total accruals will be zero when, say, AREV is zero). Secondly, regressions estimated with the constant suppressed preclude an analysis of the goodness-of-fit of the models because the associated R-square values are unreliable*". In Peasnell et al. (2005) researchers apply the first method that include scaling the intercept by lagged total assets and then repeat their tests considering the second method. Their findings, as they clarify, are substantially the same (p. 1321). However, even in Peasnell et al. (2000) researchers repeat their test considering the second approach and report that their findings for both methods are identical (p. 316).

3.5 Can the Estimated Abnormal Accruals Figures be Misleading?

According to the related literature, estimates for abnormal accruals can be misleading because of any reason (or mix of reasons) of the following:

(1) *Total accruals* are estimated improperly. Possible reasons are:

- *Misclassification.* For more accurate classification items like gains and losses in the income statement, while not operational need to be deducted from income before computing total accruals, Bernard and Skinner (1996). (Note: this is mainly applicable if accruals are estimated using income statement approach: Operating Accruals= Net Operating Income – Operating Cash Flow).

- *Measurement errors* in estimating total accruals. If total accruals and its abnormal part are computed using the balance sheet, events such as mergers, acquisitions, and divestitures are likely to create abnormal accruals measurement errors. Hribar and Collins (2002) believe that if such items were material should be deducted from total accruals before the decomposing process takes place.

(2) Random measurement error (i.e. random noise) in estimating *abnormal accruals*. This still can happen even if the model used to estimate normal accruals is well specified in terms that it accounts for all the factors generating abnormal accruals. A *random* measurement error can be distinguished from another measurement error described as *systematic* measurement error in the sense that the later follows a specific pattern. In finance context, the random measurement error is seen to have a zero expected value and therefore does not bias estimations of parameters [i.e., say: $\tilde{b}$ in Eq.7 of this chapter] for explanatory variables [i.e., say: PART in Eq.7], though statistically it reduces the significance of the coefficients through increasing their standard errors. Statistically, this occurs as was mentioned before as a result of omitting explanatory variable(s) that ought to be included in the equation that generates the normal part of total accruals. In the earnings management literature such a random measurement error has the potential that it reduces the power of the model used to detect any discretionary accrual behaviour, Young (1999, p. 2). Put another way, all else equal, the higher the random error volatility, the *more* managed values are needed so as to be *statistically* detected. In the related literature, researchers usually differentiate between alternative earnings management models on the basis of how much a model is well-specified (i.e., generates unbiased parameters) and powerful (i.e., has less measurement errors volatility which is of zero or close to zero expected value). A well-specified model with the least possible random measurement errors is always

preferred. As was emphasised, Dechow et al. (1995) observe that the five models they study (among them the Jones and the Modified Jones) appear to be well specified when applied to random samples of shares. On the other hand, although the Jones Model and the MJM produce the least standard errors it is found that *none* of the models produces *powerful* tests for earnings management of economically plausible magnitude (p. 204).

(3) Systematic measurement error (i.e., systematic noise) in estimating *abnormal accruals*. This kind of measurement error occurs if and only if the model used to detect any earnings management is not well specified. More specifically, the model used to estimate normal accruals omits some statistically important explanatory variable(s). This has the potential of estimating *biased* explanatory variables' parameters (i.e., in our case; the magnitude and direction of any earnings management). Young (1999, p. 2) notes "*the more systematic error generated by the estimation procedure, the greater the likelihood for bias in the empirical test*". According to Gujarati (1992), the magnitude and direction of the bias in the estimated parameter [i.e., say: $\hat{b}$ in Eq.7 on page 69] is equal to the result of multiplying the slope coefficient (sign and magnitude) that stems from regressing the dependent variable on the omitted explanatory variable (as if both of the explanatory variables are included), by the slope coefficient (also sign and magnitude) that results from regressing the omitted explanatory variable on the included variable [say; PART is the included variable in Eq.7]. These statistical issues are emphasised in section 3.2.1. Identical approach in analysing the bias is that of Young (1999, p. 26), who clarifies "*The term 'systematic error' refers to instances where the sign and/or magnitude of the measurement error in estimated discretionary accruals is directly and predictably*

related to the sign and/or magnitude of a variable orthogonal to actual discretionary accrual activity".

In the earnings management context, major consequences for modelling the incidence of earnings management with systematic measurement error can be such that statistically *observing false (not observing real)* managerial discretion. We recall back that Dechow et al. (1995) document that all the models they study induce systematic measurement error when applied to firms with extreme earnings and cash flow performance. On the other hand, Guay et al. (1996) points that the Dechow's et al. (1995) point of view regarding rejecting the hypothesis of no earnings management (in favour of H_1: earnings are managed) when applied to random samples with extreme earnings and cash flow performances can be confusing since as they believe that if "*managers smooth the cash flow fluctuations, the degree of overrejection is overstated*".

Regarding five earnings management models evaluated by Young (1999), he identifies three explanatory variables ought to be included in the model that generates normal accruals, these are: operating cash flow, sales growth and fixed asset structure. He stresses that these three represent important sources of measurement error in all five models evaluated.

Regarding operating cash flows, the finding is that firms *normally* tend to smooth earnings. The implication is that when operating cash flows are extremely high/low firms reduce/increase their *non-discretionary* accruals. According to the second non-discretionary explanatory variable that ought to be included; sales growth (firm specific-growth rate) he believes that firms experiencing high/low growth rates need more/less non-discretionary accruals.

Finally, Young clarifies that the last explanatory variable to be included is the fixed assets structure. He states that fixed assets should not be accounted for by the model as a sum total as in the Jones or in MJM, but as a fixed assets structure that considers in addition to the net value of fixed assets (i.e., fixed assets intensity), the speed at which different companies depreciate their assets (i.e., the useful economic life of the fixed asset stock). He notifies "*Failure to adequately control for differences in the level of firms' depreciation expense will result in part of the negative non-discretionary accruals associated with a large depreciation expense being incorrectly attributed to income-decreasing discretionary accrual activity, and vice versa. In other words, even in the absence of any earnings management activity, firms with a high depreciation charge may appear as though they are making income-decreasing accounting choices*", Young (1999, p.11).

We conclude that a reliable and accurate determination of the sign and magnitude of earnings management needs all of the following:

- Total accruals have accurately been calculated.
- The model used to generate normal accruals includes all the explanatory variables that actually affect the level of normal accruals (i.e., the normal accruals derivers). This makes the model well specified.
- The model used to generate normal accruals generates the lowest possible volatility of the random measurement errors. That is; a powerful model.
- If these three conditions are met, then a model can be described as successful in separating total accruals into its two main intended parts; the normal and abnormal accruals.

3.6 Summary

Four famous earnings management models are explored in this chapter; the Healy model (1985), the DeAngelo model (1986), the Jones model (1991), and the Modified Jones Model (1995). The models were compared based on how much risk there is of a model generating types *I* and *II* errors.

The first type error occurs if the hypothesis test rejects the null hypothesis H_o when it is true. On the other hand, the second type error occurs if the test accepts H_o when H_1 is true.

Statistically, a model is said to be well-specified if it generates unbiased estimates of the real population parameter (i.e., the real earnings management), producing low levels of types *I* and *II* errors.

A model is of low power in detecting earnings management if it incorrectly excludes a variable(s) that ought to be included in the regression leading to overestimation of standard errors of parameters of the included variable. Consequently, large amounts of earnings management will be required before being detected by the model, leading to incurring higher than acceptable levels of type *II* errors.

Applying the four models to a randomly selected sample of firms, it is found that the models generate similar levels of risk to those accepted by researchers regarding rejecting true hypothesis H_o of no earnings management. It was also revealed that *none* of the models produces *powerful* tests for earnings management as a result of producing high levels of standard errors. With that regard, the Jones and MJM produce the least standard deviations of 9%.

Furthermore, Dechow et al. (1995) show evidence that all models appear unspecified producing systematic measurement errors when applied to firms with extreme earnings and cash flow performance.

However, it is found that all the models are capable of discovering a fixed and known amount of accrual manipulation that has been artificially introduced for randomly selected samples. Results of this test show that the models are successful in producing *unbiased* estimates of earnings management (low levels of type *II* errors) arranged from the highest to the lowest as: the MJM, the Healy's, the Jones model, then the DeAngelo model comes at the last as it produces the highest standard error.

Similar results are also obtained by the models discovering manipulation for a sample of 32 firms that are subject to SEC enforcement actions for allegedly overstating annual earnings.

Despite having the least standard error, the Jones model has been documented as of low power in detecting real manipulation compared with the MJM, since the former underestimates earnings management of revenue, more specifically, when manipulation is introduced through receivables, leading to downwardly estimates of real manipulation.

Finally, cross-sectional and time-series applications of the Jones and MJM are clarified. The merits and demerits for each application are noted supported by variety of researchers' views. While (a) reducing the number of firms in the sample, and (b) a possible selection bias, can be the most documented arguments against employing the time-series applications, the cross-sectional method neglects firms' specific conditions in estimating parameters of the normal accruals drivers, and perhaps more importantly, in considering implications of income reversal resulting from the need to offset a prior income-increasing (decreasing) accounting choice by a subsequent income-decreasing (increasing) one, respectively.

CHAPTER
FOUR

RESEARCH METHODOLOGY "ONE"

4.1 Introduction

This study deals in depth with two main areas of research; the first relates to accounting considering abnormal accruals and their calculations using a specific accounting earnings management model; the second relates to finance in considering abnormal returns of portfolios created on the basis of the magnitude of abnormal accruals.

Summary of method:

Step 1: The four minor samples: sample (A), sample (B), sample (C), and sample (D).

This study examines how the market reacts to published accounting information in the form of abnormal accruals. Researchers in measuring sample portfolios' returns usually commit themselves to forming portfolios at the beginning of January each year. There is a problem with this approach: the accounting year-end may be 12 or more months prior to the portfolio formation date and thus out of date. To estimate accurately the sample portfolios' returns we start observing market returns within a reasonable time span after the publication of financial reports. UK firms are allowed 6 months as from the date of their financial year-ends to publish their accounts. But if we committed ourselves to exactly 6 months as from firms' distinct financial year ends that means we could end with dozens of different sample portfolio formation dates for any one year resulting in the number of observations in each sample being so low that we cannot later create deciles from such samples based on the magnitude of firms' abnormal accruals. We compromise between the merits of more accuracy resulting from starting observing companies' returns as quickly as possible (i.e., starting 6 months from the date of their financial year ends), and the demerits of a low number of firms accompanied with more samples, by creating four samples each year. Companies in each group share the very important attribute that their financial year-ends come within the same quarter or half of the year. We refer to these groups as sample (A), sample (B), sample (C), and sample (D). These have their financial year-ends within the first quarter of the year (Jan-Mar), the fourth or last quarter of the year (Oct-Dec), the first half of the year (Jan-Jun), and finally, the second half of the year (Jul-Dec), respectively.

Step 2: Testing portfolios.

Each sample is tested using 23 abnormal accruals portfolio formation dates starting from the year 1979 to 2001. Twenty three is the maximum available because of the need to use at least 12 years of accounting data to estimate abnormal accruals *before* the formation of a portfolio. Thus with 1968 the first year with accounting data, 1979 becomes the first portfolio formation year.

The test period following portfolio formation is three years. At each formation date, shares in each sample (A, B, C, and D) are classified into 10 abnormal accruals deciles. Decile portfolio number one includes all firms with the lowest 10 per cent of abnormal accruals estimates. Abnormal accruals decile number ten includes all the firms with the highest 10 per cent of abnormal accruals estimates. Consequently, this study accounts for 92 formation dates for the four samples (resulting in 920 abnormal accruals deciles).

Step 3: Adjusting for market returns, risk, size and book-to-market ratio.

Abnormal accruals deciles' buy-and-hold raw returns are first adjusted by the general return of shares on the stock market (a portfolio benchmark buy-and-hold raw returns). They are then examined after adjusting for the potential for small firms to out-perform large ones, as discussed in the literature (returns on size-control portfolios are used to adjust return on the abnormal accruals deciles), then the returns are adjusted for on the book-to-market ratio phenomenon in the literature, whereby companies with high balance sheet values relative to stock market value (market capitalisation) tend to out-perform companies with low book values relative to market values. Finally, both the size and the book-to-market anomalies in the literature are adjusted for in a combined analysis.

Estimated abnormal returns are summarised averaged for five periods: the first 12, second 12, third 12, first 24 and first 36 months as from portfolio formation dates. Finally, results of the estimated abnormal returns for the two sample combinations [(A+B): the two quarterly samples A and B] and [(C+D): the two half year samples C and D] are also reported.

Step 4: Weighting shares within portfolios.

Researchers in this area generally either weight each share in the portfolios equally or in accordance with the share's relative size as measured by market capitalisation. In order to be more thorough than most studies here we first test when using equal weights and then test using weights according to market capitalisation. Monthly share market capitalisations are used to estimate portfolios' returns under the value-weighted-basis for calculating returns as opposed to committing the calculations to the share market capitalisations as at the portfolios' formation dates. Moreover, when sample returns are adjusted using returns on broad market portfolio, a specific market-index, for each of the 92 abnormal accruals formation dates included in this study, is created to avoid potential distortion resulting from the problem of the "new-listing" bias.

Step 5: Does risk explain the abnormal returns?

The unusual returns shown in this study could be due to the extreme deciles exhibiting high or low degrees of risk. To investigate this a comprehensive risk analysis for the abnormal accruals deciles is conducted including: (i) the use of standard deviation, (ii) year by year reliability, (iii) liquidation rates, (iv) the use of three forms of the capital asset pricing model (CAPM). Sample abnormal accruals Jensen alpha, are used as well as another two applications of the CAPM. We have developed new methodologies here: The first new application of the CAPM requires estimating the equivalent of Jensen alpha through using size-control returns instead of returns on the market as the independent variable in the traditional CAPM equation; the second new application requires estimating the equivalent of Jensen alpha when book-to-market-control returns are used as the independent variable in the original CAPM equation. Finally, (v) we use the Fama and French's (1993) three-factor model.

4.2 Hypotheses of this Study

Three hypotheses are investigated in this study. It is proposed that on average, there is a negative relation between abnormal accruals [i.e., accruals prediction (forecast) errors] and abnormal returns. More specifically, firms with the *highest/lowest* abnormal accruals in one year experience on average *lower/higher* abnormal returns in the subsequent first, second and third year, respectively. Accordingly, shares with the lowest abnormal accruals (most negative) experience statistically significant higher returns relative to both the market and those shares with the highest accruals forecast errors. And so, a trading strategy of buying *long/going short* in shares with the *lowest/highest* abnormal accruals yields *positive* excess returns.

The hypotheses are:

$H_{0,1}$: Shares with the *highest 10%* of abnormal accruals experience on average abnormal returns ≥ 0.

$H_{1,1}$: Shares with the *highest 10%* of abnormal accruals experience on average abnormal returns < 0.

And:

$H_{0,2}$: Shares with the *lowest 10%* of abnormal accruals experience on average abnormal returns ≤ 0.

$H_{1,2}$: Shares with *lowest 10%* of abnormal accruals experience on average abnormal returns > 0.

And:

$H_{0,3}$: A trading strategy of simultaneously buying *long/going short* in shares with the *lowest /highest* 10% of abnormal accruals yields abnormal returns ≤ 0.

$H_{1,3}$: A trading strategy of buying *long/going short* in shares with the *lowest /highest*

10% of abnormal accruals yields abnormal returns > 0[1].

It is important to note that these hypotheses implicitly consider that shares with the *highest/lowest* 10% of abnormal accruals are dominated by if not absolutely consist of shares with *positive/negative* abnormal accruals, respectively[2].

4.3 Data, Main Sample Selection, and a Consideration of the Accruals Estimation Procedures

This section considers the method used in this study to estimate abnormal accruals, data handling, and sample constructing.

The main sample in this study includes all the companies listed on the London Stock Exchange (LSE) and those quoted on the Alternative Investment Market (AIM) for the period Jan 1968 to June 2005[3].

Separate analysis for the distribution of number of companies quoted on different markets in the UK has been conducted. Results for this analysis clearly show a recent trend towards shares being quoted on the AIM instead of the Main Market (i.e. the Official List 'LSE') as

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[1] The *two-sided* hypothesis test is used when any abnormal returns are examined if they are equal to zero or not.

[2] Over long periods, for groups of shares, normal (or nearly normal) distribution for earnings management amounts can be expected for a well defined earnings management model *if* earnings are managed in equal amounts; that is, any earnings managed this year is reflected the following year. Jones (1991, p. 210) stress that earnings managements amounts all together are equal to zero over the all years of firms.

[3] And so, companies quoted on the Unlisted Securities Market (USM), the Third Market, Over the Counter (OTC), the OFEX, and Split Trusts are all excluded from both the sample and the market portfolios.

appears in table 4.1. Percentages of companies listed on the Main Market and percentages of companies quoted on AIM (both relative to total number of all shares quoted on all markets) are: [(99%, 1%), (98%, 1%), (85%, 4%), (77%, 7%), and (36%, 61%)] for the five distinct periods in the analysis: [(1955-1964), (1965-1974), (1975-1984), (1985-1994), (1995-2005)], respectively. Note that the AIM did not exist until 1995, this means that all the firms classified as AIM before that year were quoted on another market then joined the AIM in the year 1995 or later.

As in most of the studies that generally investigate issues related to earnings management [such as Burgstahler and Dichev (1997), and Holland and Ramsay (2003)], or to normal accruals [such as Houge and Loughran (2000), Sloan (1996) and, more importantly, Dechow et al (1995)], all companies apart from banks, financial institutions and firms in regulated industries (e.g. utilities) are included in the sample.

This study does not commit itself to just those companies with Dec 31, fiscal year end. That is, any company qualifying for our accounting data selection criteria is a possible observation in one of the samples regardless the date of the financial year end for that company.

Based on the discussion presented in section 3.4 of chapter three regarding the variation in applications of the MJM, specifications of the method used by this study to estimate the normal and abnormal parts of total accruals are introduced:

- Time-series rather than cross-sectional MJM is employed. Indeed, we believe that normal accruals are driven by company-specific factors (drivers) more than industry-factors.
- Following Ahmed et al. (2005) and Kothari et al. (2005) a firm's change in receivables is deducted from its change in revenues within coefficient estimation periods.

TABLE 4.1

NUMBERS OF SHARES QUOTED ON THE DIFFERENT MARKETS WITHIN THE LONDON STOCK EXCHANGE (LSE)

This table shows numbers of shares quoted on seven distinguished markets in the UK. These markets include the Official List (i.e., the Main Market) and the Alternative Investment Market. Five distinct periods are used to facilitate comparisons among the different Markets over time [1].

NAMES OF THE DIFFERENT SHARE MARKETS WITHIN THE LSE		FIVE DISTINCT PERIODS (Represent in Total the Whole Period Considered by LSPD)										THE WHOLE PERIOD	
LSPD Codes for Different Markets [2]	*Different Share Markets*	*(1955-1964)*		*(1965-1974)*		*(1975-1984)*		*(1985-1994)*		*(1995-2005)*		*(1955-2005)*	
		No.of Shares	*%*	*No.of Shares*	*%*	*No.of Shares*	*%*	*No.of Shares*	*%*	*No.of Shares*	*%*	*No.of Shares*	*%*
4096	Unlisted Securities Market (USM)	3	0%	3	0%	159	9%	169	12%	0	0%	334	4%
16384	Third Market Companies	0	0%	0	0%	0	0%	9	1%	0	0%	9	0%
32768	Over the Counter Companies (O.T.C)s	0	0%	0	0%	0	0%	4	0%	0	0%	4	0%
65536	Split Trusts	4	0%	4	0%	25	1%	44	3%	69	3%	146	2%
1048576	Alternative Investment Market [3]	20	1%	12	1%	76	4%	101	7%	1536	61%	1745	20%
	Numbers of Listed Shares ON THE MAIN MARKET [4]	1959	99%	838	98%	1465	85%	1095	77%	916	36%	6273	74%
	Totals Of All Types Of Quoted Shares	**1986**	100%	**857**	100%	**1725**	100%	**1422**	100%	**2521**	100%	**8511**	100%

Where:

1 Source of data for this analysis is the London Share Price Data (LSPD) 2005 Database.

2 These codes are as presented by LSPD, file lspdG, column (G13).

3 Note that the Alternative Investment Market (A.I.M) did not exist until 1995. This means that all the firms that are classified as A.I.M firms while have starting dates on LSPD before that year were quoted on another market then joined the A.I.M. E.g., the 20 firms with starting dates within (1955-1964).

4 Numbers of listed shares are obtained by deducting all the above share numbers (i.e., the above six type shares) from the totals of all quoted shares.

- Total accruals are calculated using the balance sheet approach rather than income statement approach. The main reason can be because of cash flow data limitation as cash flow statements were not required by the time we started using accounting data (i.e., the year 1968). Examples are Gore et al (2007), Gu et al. (2005), and Bergstresser and Philippon (2006).
- Total operating accruals rather than current operating accruals is considered as the dependent variable in the model, and so, property, plant and equipment is introduced as a second explanatory variable in the model (i.e., besides change in revenues minus change in receivables). A procedure by which we wanted to follow the majority of researchers, like Ball and Shivakumar (2006), Wang (2006), and Guay (2006).
- All the term (α_i $[1/A_{it-1}]$) in Eq./(15) is considered as the value of intercept (i.e., the constant) rather than scaling the real intercept (α_i) by the lagged total assets. By this preference we seek better specification of estimated parameters as in Peasnell et al. (2000, and 2005).

Starting from the 1968 to 1990, any company with accounting data of 12 years or more is initially included in the sample. As a matter of fact deciding on 12 years as the minimum period of the required accounting data for a company to be included in the sample is the result of considering three factors: (i) all else equal, the higher the number of observations included in the MJM regression (Eq./(15) in chapter three), the more efficient is estimation of regression coefficients (i.e., positive aspect). (ii) All else equal, the higher the number of observations considered by the regression, the lower the number of firms included in the sample because not all the firms have a long time-series of data (i.e., negative aspect). (iii) The higher the number of observations (i.e., years) included in time-series regressions, the higher the possibility of obtaining biased regression coefficients if companies' specific operational requirements are time specific; this arises since time-series models assume that the coefficients are stable across years. If regressions' coefficients are estimated with significant bias this will mean the estimated normal accruals, and by the result estimated abnormal accruals, are biased. Specifications of the time-series models are covered in section (3.4) of chapter three.

Jones (1991) uses 14 observations (years) as a minimum to estimate regression coefficients (p. 206)[4]. DeFond and Jiambalvo (1994) use the Jones Model with a minimum of six observations for estimation purposes (p. 158). Young (1999) employs the MJM and a minimum of six observations (p. 846). Peasnell et al. (2000) employ the Jones and MJM on a cross-sectional basis and require a minimum of ten observations for their regressions, (p. 316). Peasnell et al. (2005) employ the MJM on cross-sectional basis and require a minimum of ten observations (p. 1321). Gu et al. (2005) employ the MJM on two bases; the time-series and the cross-sectional. For the time-series MJM regressions they require at least 10 years, and for the cross-sectional a minimum of 15 industry-observations, (p. 321). Gore et al. (2007, p. 129) employ cross-sectional MJM with any industry-year less than six observations is deleted[5].

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[4] Jones (1991) uses ranges between 14 and 32 years. Because her model considers stationary parameters for the regressions, she points "*the use of a long time series of observations improves estimation efficiency but also increases the likelihood of structural change occurring during the estimation period*".

[5] It is worth pointing that Peasnell et all. (2000, and 2005) and Gore et al. (2007) drop the explanatory variable 'Property, Plant and Equipment' (P.P.E) from their models. In doing so, they depend on findings by Beneish (1998) and Young (1999) arguing that depreciation expense is not easily manipulated. And so, Peasnell et all. (2000, and 2005) and Gore et al. (2007) consider working capital accruals [defined as total accruals (Eq.(1) in chapter three) minus depreciation and amortisation expense] instead of total accruals. Since they excluded depreciation and amortisation expense from the dependent variable (i.e., working capital in such cases) in the regression, they also excluded that's expense normal driver (i.e., PPE) from the Jones and MJM. The number of explanatory variables is positively correlated with the minimum level of observations included in a regression so as to obtain efficient estimates of coefficients.

Accordingly, we find it satisfactory to require a minimum of 12 years of accounting data for a company as a primary condition to be included in the sample.

In the related literature, it is normally the case to use the longest time series of accounting observations immediately before the event year for regression purposes, e.g., Jones (1991), and Young (1999). However, in this study the situation is slightly different. To increase the number of companies in the sample we do not commit a share's estimation period to the longest period of accounting data immediately before the event year, but instead, we commit the regression to a minimum number of observations (i.e., years), in the sense that a single share over the study period can be tested, and therefore regressions estimated, more than one time depending on the number of observations available for the that share. Therefore, estimation periods for different companies can vary in number of years (i.e., observation) that are included in the one period. A company to be included in the sample at any decile portfolio formation date is required to have a minimum of 12 years of accounting data. Of these, the first 11 years are used to estimate parameters of the *normal* accruals model, and the last year is used to estimate any variance between actual accruals and what was estimated by the normal accruals regression, which technically is called abnormal accruals. If a company has more than 12 years, the increase in the number of years available is positively correlated with the years included in the regression. For example, if a company has accounting data of 19 years all of them within the study period. This company will be tested 8 times in 8 different years, in each of these time periods that company will be dealt with as a new company. In the first examining period 11 years (i.e., the minimum regression time-observations accepted by this research) will be used for the regression and year 12 to estimate any abnormal accruals. In the second examining period 12 years will be used in the regression and year 13 to estimate any abnormal accruals. And so on, till the last examining period, where 18 years will be included in the regression and year 19 to estimate any abnormal accruals. As a matter of fact, the lowest number of accounting data time-series-intervals included in the regression is 10 (i.e., equivalent to 11 years), and the highest is 32 (equivalent to 33 years). Note that the maximum number of times the same company is tested (which has been referred to as company- or firm-years) is equal to the total number of observations available for the company -(conditional on at least 12 observations)- minus 11 which represent the minimum number of observations accepted to run a regression. Accordingly, 23 is the maximum possible number of times a company can be tested over the study period. Which is equal to total number of accounting observations collected over the study period (i.e., 34 years, starting from 1968 to 2001), minus 11 represents the minimum number of years accepted for the regression, more specifically, for the first regression.

Furthermore, although all companies are required to have accounting data for at least 12 years to be included in any of the samples, none of them is required to be listed or quoted during that whole period. That is, any company with 12 years or more of accounting data using Datastream accompanied with return data as at the formation date (six months later) using LSPD is a possible observation in one of the samples.

This accounting data is used to predict any abnormal accruals based on the discussion introduced in chapter three and which is detailed in section 4.7 of this chapter. In general, a firm's operating abnormal accruals in event year t is equal to its total operating accruals minus its normal operating accruals all in event year t. This equation of abnormal accruals has three variables with just one of them known (i.e., total accruals).

According to the MJM model -(used by this study to separate total accruals into normal and abnormal parts)-, the way out is through estimating normal operating accruals for the event year t. Then, abnormal accruals for event year t is obtained by matching the year's t estimated normal accruals with actual total operating accruals.

When time-series models are employed, this procedure is facilitated by hypothesising that the variables that drove the normal accruals level in the past (i.e., change in revenues and property, plant and equipment) will continue to drive normal accruals for the event year with the same level of influence for each variable.

For a specific company-year, total accruals (TA_{it}) are calculated for all the years specified for estimating coefficients of the normal accruals' drivers through using Eq.(1): $[TA_{it}/ A_{it-1} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it})/ (A_{it-1})]$ that was first introduced in section (3.2) of chapter three.

Then, total accruals over the one estimation period are regressed on two explanatory variables: (i) changes in revenues adjusted for changes in receivables, and (ii) values of property, plant and equipment to estimate these two explanatory variables coefficients through using Eq.(15) on page 102 of chapter three: $[TA_{it}/A_{it-1} = \alpha_i (1/A_{it-1}) + \beta_{1i} (\Delta REV_{it} - \Delta REC_{it} /A_{it-1}) + \beta_{2i} (PPE_{it}/A_{it-1}) + \varepsilon_{it}]$. Once these two explanatory variables' coefficients are estimated, we apply to them their actual values taken from the event year t to estimate its normal accruals. As a final step regarding estimating the abnormal accruals part of total accruals in the event year t, we match the event's year t estimated normal accruals with its actual total accruals [year's t actual total accruals is also obtained by applying Eq.(1)]. (A comprehensive discussion on the method used to estimate abnormal accruals using the MJM is presented in section 4.7 of this chapter).

As will be emphasised in the next chapter, once company-years' abnormal accruals in event years over the whole study period have been recognised, company-years will be sorted from the lowest abnormal accruals to the highest, (i.e., by considering the sign and magnitude of those company-years' abnormal accruals). Based on that sorting, decile portfolios are formed each year over the study period.

Deciles are formed at least six months but not more than 9 months for the quarter samples A, and B (not more than 12 months for the semi-annual samples C, and D) after firm-years' financial year ends, a procedure by which it is meant to ensure that companies' financial statements have been publicly released by the time we start measuring deciles' returns which starts the following month after the formation date[6].

For each of the four samples (A, B, C, and D) tested in this study, a total of 23 portfolio formation dates starting from 1979 to 2001 are considered. That is, the final number of different formation dates for all the samples is 92 formation dates.

The year 1979 represents the formation date year for those company-years starting their series of accounting data as from 1968. And so on, till year 2001 which represents the formation date year for those company-years starting their series of accounting data as from 1990.

In a second part of the analysis, abnormal returns are estimated for all different accruals decile portfolios that have been established on the basis of their abnormal accruals in the prior stage. Methods used to estimate abnormal returns for decile portfolios are covered thoroughly in chapter five (Methodology (2)).

This study depends on two different databases to obtain its data. The need for two databases arises form the fact that each database specialises in one kind of data. It uses Datastream as a database to obtain the required accounting data, and the London Share Price Data (LSPD) 2005 database, prepared by London Business School, to obtain the required return data.

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[6] A common procedure in the related earnings-returns studies is that the measurement of post rank period (event period) returns starts a few months after the financial year end to allow for the data to be published. This period varies from one country to another depending on how many months are granted by different countries as a maximum period after companies' financial year ends to publish their accounts. Using USA data, Sloan (1996), and Houge and Loughran (2000) start accounting for returns four months after the end of the fiscal year. Subramanyam (1996), and Xie (2001) start their computations of returns three months after the fiscal year end.

To specify the main sample, two main stages of analysis are conducted. In the *first* stage, Datastream as a source to obtain the accounting data is used. Then, in the second stage, any company with accounting data of 12 years or more is matched with its return data using LSPD 2005.

Datastream presents the accounting data for two groups of companies separately; these are the 'UK-alive' companies (alive here is restricted to being quoted on the LSE as at the time of data collection, that is Dec, 2006), and the 'UK-dead' companies (dead here is restricted to those companies that were quoted on the LSE sometime in the past, but by Dec, 2006 have been removed).

Regarding the UK-alive companies (hereafter alive companies) Datastream offers data for a total of 2509 companies. From these, a total of 540 companies are initially excluded as a result of being in highly regulated sectors and/or financial companies (in this study it is referred to these companies as not-accepted sectors) that include companies like: banks, electrical and water, financial and insurance companies. Companies in the real estate sector are also excluded.

The remaining 1969 alive companies represent companies working in 'Accepted-in principle' sectors. For the sake of providing as much information as possible and to help in planning work, a further detailed analysis regarding those companies is done as appears in Table 4.2. Out of 1969, companies in columns 4, 5, and 6 meet the condition of having the required accounting data for 12 years or more. Column 4 represents those companies with regular financial year ends. For a specific company "regular" means to have all of its accounting time-series observations dated within the same quarter of the year. All else equal, the more companies commit themselves to a specific year ends regarding preparing and later publishing their accounts, the more effectively estimates of regressions coefficients can be obtained. Effective coefficient estimates are desired for estimating normal accruals in the event year

TABLE 4.2

2509 UK-ALIVE COMPANIES ARE CLASSIFIED ACCORDING TO THEIR SECTORS.

(ACCEPTED AND NOT ACCEPTED SECTORS (BY THIS STUDY) ARE LISTED. A TOTAL OF 359 ALIVE COMPANIES ARE FINALLY REPORTED TO BE INCLUDED IN THE SAMPLE. (NOTE THAT ALIVE REFERS TO BEING QUOTED ON THE LSE AS IN Dec, 2006 IN ADDITION TO HAVING ACCOUNTING DATA ON DATASTREAM)

NOT-ACCEPTED SECTORS			ACCEPTED SECTORS									
					Alive- 'Sample Companies'		Alive Companies That Are Excluded From The Sample As They:					
Serial sector number	Column(1): Not accepted sectors	Column(2) Number of companies	Serial sector number	Column(3): Accepted sectors	Column(4): Companies with at least 12 years of accounting data and were matched with their returns/ LSPD	Column(5): As in column (4) but firms' financial statements vary in the month of preparation	Column(6): Have 12 years of accounting data but could not be matched with their returns/ LSPD	Column(7): Have 12 years of accounting data but that data is incomplete	Column(8): Have accounting data for less than 12 years. Specifically: 11 or 10 years	Column(9): Have accounting data for less than 12 years. Specifically: 9 years or less	Column(10): Companies that are repeated on Datastream under different names	Column(11): Totals of companies in accepted sectors
1	BANKS	15	1	A-C-AEROSPACE & DEFEN	9	0	0	0	0	7	0	16
2	ELECTRICITY	16	2	AUTOMOBILES & PARTS	4	0	0	1	0	8	0	13
3	EQUITY INVESTMENT INS	57	3	BEVERAGES	3	0	0	0	1	9	0	13
4	GAS, WATER, MULTIUTILI	15	4	CHEMICALS	11	0	0	0	0	27	0	38
5	GENERAL FINANCIAL	266	5	CONSTRUCTION & MATEF	24	1	0	0	0	22	0	47
6	LIFE INSURANCE	10	6	ELECTRONICS, ELECTRIC	20	0	0	2	0	53	0	75
7	NONLIFE INSURANCE	31	7	FIXED LINE TELECOMUNI(	2	0	0	0	0	21	0	23
8	REAL ESTATE	130	8	FOOD & DRUG RETAILERS	6	0	0	3	0	3	0	12
			9	FOOD PRODUCERS	12	1	0	1	0	27	0	41
			10	FORESTRY & PAPER	1	0	0	0	0	4	0	5
			11	GENERAL INDUSTRIAL	7	0	0	0	0	12	0	19
			12	GENERAL RETAILERS	23	0	1	6	2	52	0	84
			13	HEALTHCARE EQUIPMEN'	8	1	0	0	0	59	0	68
			14	HOUSEHOLD GOODS	20	2	0	0	0	16	0	38
			15	INDUSTRIAL ENGINEERIN	30	1	1	4	0	40	0	76
			16	INDUSTRIAL METALS	1	0	0	1	0	11	0	13
			17	INDUSTRIAL TRANSPORT.	8	0	0	2	2	17	0	29
			18	LEISURE GOODS	4	1	0	1	0	10	0	16
			19	MEDIA	26	1	0	7	0	131	0	165
			20	MINING	5	0	0	3	0	130	0	138
			21	MOBILE TELECOMMUNICA	1	0	0	0	0	19	0	20
			22	OIL & GAS PRODUCERS	5	2	0	1	0	90	0	98
			23	OIL EQUIPMENT & SERVIC	1	1	0	0	0	15	0	17
			24	PERSONAL GOODS	14	0	0	3	1	10	0	28
			25	PHARMACEUTICALS, BIOT	3	1	0	3	2	83	0	92
			26	SOFTWARE & COMPUTER	15	2	0	4	2	186	0	209
			27	SUPPORT SERVICES	49	4	1	6	4	173	0	237
			28	TECHNOLOGY HARDWAR	9	0	0	1	0	45	0	55
			29	TOBACCO	1	0	0	0	0	4	0	5
			30	TRAVEL & LEISURE	18	1	1	2	3	131	0	156
			31	* UNCLASSIFIED	0	0	0	14	1	32	0	47
			32	* UNQOUTED EQUITIES	0	0	0	40	34	2	0	76
Totals		540			340	19	4	105	52	1449	0	1969

TOTAL NUMBER OF ALIVE COMPANIES =(540 + 1969)= **2509**

Where:

Column (1): shows alive-company sectors which are not accepted by this study.
Column (2): shows total numbers of alive companies for each of those not-accepted sectors.
Column (3): shows alive-company sectors which are accepted by this study.
Column (4): shows number of alive companies that are primarily included in this study (*in addition to companies in column (5)*). (These met the condition of having at least 12 years of accounting data on Datastream & have successfully been matched with LSPD to obtain their returns).
column (5): shows number of alive companies that have 12 years or more of accounting data but with various financial year ends. These companies are included in the sample of this study since variation of dates of financial reporting takes place just within the first 11 years (the period used to estimate any abnormal accruals. And therefore, does not affect the accuracy with which returns later are calculated.
column (6): shows number of alive companies that have 12 years or more of accounting data but were excluded from the sample. Reason for exclusion is specified in not being able to match those companies' accounting data from Datastream with their returns on LSPD.
Column (7): shows number of dead companies that were excluded from the sample. Although in many cases they have 12 years of accounting data, but their accounting data is incomplete. As a matter of fact, they suffer dramatically that they do not provide in any way data for the variables needed for the abnormal accruals estimation.
Column (8): shows number of alive companies that were excluded from the sample since they have not met the condition of having a minimum of 12 years of accounting data . These companies restrictly have either 11 or 10 years.
Column (9): shows number of alive companies that were excluded from the sample since they have not met the condition of having a minimum of 12 years of accounting data . These companies have 9 years or less.
Column (10): shows number of alive companies that were excluded from the sample as a result from being repeated on DATASTREAM under two different company-numbers.
Column (11): shows totals for columns (4), (5), (6), (7), (8), (9), and (10).

* *Accounting data for alive companies in these sectors is not available .*

Note: Primary *total number from alive-company-source included the sample of this study is 359 companies. (This is equal to adding companies in column (4) to those in column (5)).*

which is due one year ahead as from the end of the estimation period. Column 5 includes companies with at least 12 years of accounting data but vary in their financial year end dates. Variation is restricted to occur within not more than the first 11 years; the period used for estimating the abnormal accruals. That is; these companies should have regular financial year ends as from year 12 if not before. This is vital for proper measurement of returns since once a company has been identified as a member in one of the samples (A, B, C, or D) that have been basically classified on the basis of their financial year ends, we commit this company to the same date for measuring return each year as long as the firm is tested. If during the period in which returns are estimated for a specific company, the company moved forward or back in preparing and publishing their accounts, it is possible that we start measuring returns for such a company assigned to one of the deciles on the basis of its abnormal accruals while its accounts that constitute the basis for estimating any abnormal accruals is not published yet or even prepared. As a matter of fact, just companies in these two columns (i.e., 4, and 5) are the companies of alive source and included in the primary main sample, these together are 359 companies.

Column 6 represent companies with at least the minimum required period of accounting data as mentioned, but could not be matched with LSPD, and therefore, four companies have been excluded[7]. Column 7 represents companies with missing accounting data. These are either companies existing on Datastream but without financial records, or they have financial records but they do not have specifically the accounting data needed to calculate total accruals [i.e., in Eq.(1)] or to run the normal accruals regressions [i.e., Eq.'(15)], and so a total of 105 companies is excluded.

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[7] These 4 companies could not be matched with LSPD for reason unknown to us. This could possibly be because the company is not quoted on the LSE, or it is quoted but under a second name. However, in this section of this chapter we present method employed to match companies' accounts on Datastream with their returns on LSPD.

Column 8 refers to companies with accounting data of 11 or 10 years, a total of 52 companies are also excluded[8]. Column 9 represents number of companies with accounting data equal to 9 years or less, with the majority of frequencies; 1449 companies. And finally, column (10) represents any repeated companies (although so rare, but it can happen in Datastream, to have the same company under two different numbers as if they were two different companies), with no frequencies.

An identical analysis is conducted for the UK-dead companies (hereafter dead companies). Before accounting for numbers here as happened with the alive companies, it has been preferred to address the following facts regarding collecting the dead companies' accounting data: Datastream goes back to the year 1968; the year the database was started. It generally presents the time series of accounting data for companies over four periods: the first is from 1968 to 1974, then from 1974 to 1989, then from 1989 to 2004, and the fourth and latest covers the years 2005&6. And therefore, a complete set of data for a specific dead company requires taking all these possible periods into account.

In this study, accounting data for companies has been collected starting from 1968, (i.e., going back 39 years to include all dead companies on Datastream).

Using Datastream, the total number of UK-dead companies as in Dec, 2006 is 2982. Of these 424 companies were excluded for being in highly regulated companies (referred to as the UK-dead-not-accepted sectors).

Table 4.3 shows detailed distribution for all the UK-dead companies. This table is prepared the same way the alive companies table has been prepared, and so just companies in columns 4 and 5 are the companies of dead source and contribute to the primary main sample.

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[8]These companies with 11 or 10 years of accounting data were separated form those of 9 years or less, so as to evaluate possible effects of changing the minimum number of years (i.e., 12) accepted by this study to say 11 or 10 years on the overall number of company-years included in this study.

TABLE 4.3

2982 UK-DEAD COMPANIES ARE CLASSIFIED ACCORDING TO THEIR SECTORS.

(ACCEPTED AND NOT ACCEPTED SECTORS (BY THIS STUDY) ARE LISTED. A TOTAL OF 1063 DEAD COMPANIES ARE FINALLY REPORTED TO BE INCLUDED IN THE SAMPLE. (NOTE THAT DEAD REFERS TO NOT BEING QUOTED ON THE LSE AS IN Dec, 2006 WHILE HAVE ACCOUNTING DATA ON DATASTREAM)

NOT-ACCEPTED SECTORS			ACCEPTED SECTORS									
					Dead- 'Sample Companies'		Dead Companies That Are Excluded From The Sample As They:					
Serial sector number	Column(1): Not accepted sectors	Column(2) Number of companies	Serial sector number	Column(3): Accepted sectors	Column(4): Companies with at least 12 years of accounting data and were matched with their returns/ LSPD	Column(5): As in column (4) but firms' financial statements vary in the month of preparation	Column(6): Have 12 years of accounting data but could not be matched with their returns/ LSPD	Column(7): Have 12 years of accounting data but that data is incomplete	Column(8): Have accounting data for less than 12 years. Specifically: 11 or 10 years	Column(9): Have accounting data for less than 12 years. Specifically: 9 years or less	Column(10): Companies that are repeated on Datastream under different names	Column(11): Totals of companies in accepted sectors
1	Asset Managers	18	1	Aerospace	8	0	0	1	2	1	0	*12*
2	Banks	11	2	Airlines	1	0	0	0	0	8	0	*9*
3	Commodity Unit Trusts	4	3	Apparel Retailers	8	0	0	0	1	11	0	*20*
4	Consumer Finance	1	4	Auto Parts	11	0	0	0	0	10	0	*21*
5	Electricity	16	5	Automobiles	3	0	0	0	0	2	0	*5*
6	Financial Admin	22	6	Biotechnology	1	0	0	2	0	11	0	*14*
7	Full Line Insurance	1	7	Brewers	6	0	0	0	0	2	0	*8*
8	Hedge Funds	2	8	Broadcast & Entertain	10	2	0	0	4	35	0	*51*
9	Insurance Brokers	20	9	Broadline Retailers	10	0	0	1	0	9	0	*20*
10	Investment Services	19	10	Building Mat.& Fix	30	2	0	1	1	19	0	*53*
11	Investment Trusts	18	11	Bus.Train & Employmnt	2	0	0	1	2	13	0	*18*
12	Life Insurance	9	12	Business Support Svs	28	1	0	0	3	75	0	*107*
13	Mortgage Finance	2	13	Clothing & Accessory	60	4	1	0	2	21	2	*90*
14	Other Equities	2	14	Coal	0	0	0	0	1	7	0	*8*
15	Prop. & Casualty Ins	13	15	Comm. Vehicles,Trucks	4	0	0	0	0	1	0	*5*
16	Real Estate Hold, Dev	169	16	Commodity Chemicals	20	1	0	0	0	19	0	*40*
17	Specialty Finance	62	17	Computer Hardware	0	0	0	0	0	7	0	*7*
18	Water	26	18	Computer Services	11	1	0	0	3	11	0	*26*
			19	Consumer Electronics	18	0	0	0	3	17	0	*38*
19	shares other than the official	9	20	Defense	1	0	0	0	0	2	0	*3*
			21	Delivery Services	6	0	0	0	1	9	0	*16*
			22	Distillers & Vintners	9	0	0	0	1	1	1	*12*
			23	Divers. Industrials	16	0	3	2	2	3	0	*26*
			24	Drug Retailers	1	0	0	0	0	0	0	*1*
			25	Dur. Household Prod	6	1	0	0	2	7	1	*17*
			26	Electrical Equipment	20	0	2	0	1	12	0	*35*
			27	Electronic Equipment	35	2	0	1	7	68	0	*113*
			28	Exploration & Prod	10	0	0	0	4	18	0	*32*
			29	Farming & Fishing	1	0	0	0	0	7	0	*8*
			30	Fixed Line Telecom	2	0	0	0	0	14	1	*17*
			31	Food Products	38	0	0	0	3	26	1	*68*
			32	Food Retail,Wholesale	16	0	0	0	2	12	0	*30*
			33	Furnishings	20	0	0	0	0	9	0	*29*
			34	Gambling	1	0	0	0	2	4	1	*8*
			35	Gas Distribution	1	0	0	0	0	2	0	*3*
			36	General Mining	2	0	0	0	0	6	0	*8*
			37	Gold Mining	1	0	0	0	0	2	0	*3*
			38	Healthcare Providers	1	0	0	0	1	6	0	*8*
			39	Heavy Construction	7	0	0	1	1	11	0	*20*

Table 4.3 continued.

	40	Home Construction	27	2	0	1	3	29	0	62
	41	Home Improvement Ret	2	0	0	0	1	0	0	3
	42	Hotels	12	0	0	0	1	21	1	35
	43	Industrial Machinery	110	2	1	0	7	42	2	164
	44	Industrial Suppliers	13	0	0	0	1	6	0	20
	45	Integrated Oil & Gas	5	0	0	0	0	1	0	6
	46	Internet	1	0	0	0	1	17	0	19
	47	Investment Companies	0	0	0	0	0	2	0	2
	48	Marine Transportation	10	0	1	0	0	4	1	16
	49	Media Agencies	12	0	0	0	2	29	0	43
	50	Medical Equipment	8	0	0	0	3	12	0	23
	51	Mobile Telecom.	0	0	0	0	0	9	0	9
	52	Multiutilities	4	0	0	0	0	0	0	4
	53	Nondur.Household Prod	1	0	1	0	1	1	0	4
	54	Nonferrous Metals	6	0	0	0	0	5	0	11
	55	Oil Equip. & Services	1	0	1	0	2	5	0	9
	56	Paper	3	0	0	0	2	1	0	6
	57	Personal Products	1	0	0	0	0	2	0	3
	58	Pharmaceuticals	5	0	0	0	1	19	0	25
	59	Publishing	25	1	1	1	6	47	3	84
	60	Recreational Services	19	2	0	2	5	64	0	92
	61	Restaurants & Bars	14	0	0	0	3	29	0	46
	62	Semiconductors	0	0	0	0	0	2	0	2
	63	Soft Drinks	0	0	0	0	0	1	0	1
	64	Software	10	2	0	0	2	49	0	63
	65	Spec.Consumer Service	0	1	0	0	0	3	0	4
	66	Specialty Chemicals	13	0	0	0	3	3	1	20
	67	Specialty Retailers	59	0	0	1	6	55	2	123
	68	Steel	3	0	0	1	2	2	0	8
	69	Suspended Equities	30	2	1	14	17	46	1	111
	70	Telecom. Equipment	2	0	0	0	0	5	0	7
	71	Tobacco	2	0	0	0	0	2	0	4
	72	Toys	3	0	0	0	0	4	0	7
	73	Transport Services	3	0	0	0	0	1	0	4
	74	Travel & Tourism	1	0	0	0	0	3	0	4
	75	Trucking	8	0	0	1	1	16	1	27
	76	Unclassified	28	4	0	4	5	56	0	97
	77	Unquoted equities	159	6	10	16	58	115	9	373
	78	Waste, Disposal Svs	2	0	0	0	1	5	0	8
Total: 424		*Totals:*	*1027*	*36*	*22*	*51*	*183*	*1211*	*28*	*2558*

TOTAL NUMBER OF DEAD COMPANIES =(424 + 2558)= **2982**

Table 4.3 continued.

Where:

Column (1): shows dead-company sectors which are not accepted by this study.
Column (2): shows total numbers of dead companies for each of those not-accepted sectors.
Column (3): shows dead-company sectors which are accepted by this study.
Column (4): shows number of dead companies that are primarily included in this study (in addition to companies in column (5)). (These met the condition of having at least 12 years of accounting data on Datastream & have successfully been matched with LSPD to obtain their returns).
column (5): shows number of dead companies that have 12 years or more of accounting data but with various financial year ends. These companies are included in the sample of this study since variation of dates of financial reporting takes place just within the first 11 years (the period used to estimate any abnormal accruals. And therefore, does not affect the accuracy with which returns later are calculated.
column (6): shows number of dead companies that have 12 years or more of accounting data but were excluded from the sample. Reason for exclusion is specified in not being able to match those companies' accounting data from Datastream with their returns on LSPD.
Column (7): shows number of dead companies that were excluded from the sample. Although in many cases they have 12 years of accounting data, but their accounting data is incomplete. As a matter of fact, they suffer dramatically that they do not provide in any way data for the variables needed for the abnormal accruals estimation.
Column (8): shows number of dead companies that were excluded from the sample since they have not met the condition of having a minimum of 12 years of accounting data . These companies restrictly have either 11 or 10 years.
Column (9): shows number of dead companies that were excluded from the sample since they have not met the condition of having a minimum of 12 years of accounting data . These companies have 9 years or less.
Column (10): shows number of dead companies that were excluded from the sample as a result from being repeated on DATASTREAM under two different company-numbers.
Column (11): shows totals for columns (4), (5), (6), (7), (8), (9), and (10).

Note: **Primary** total number from dead-company-source included the sample of this study is 1063 companies. (This is equal to adding companies in columns (4) and (5)).

A total of 2558 UK-dead companies represent companies working in "accepted in principle" sectors. Of these 1085 companies met the condition of having at least 12 years of accounting data (columns 4, 5, and 6). Companies from dead source and included in the main primary sample of this study are companies under columns 4 and 5. Together these are 1063 companies.

On the other hand companies in the other columns are excluded. Column 6, contains 22 companies that could not be matched with LSPD. Another 51 companies with missing accounting data as appear in column 7 are excluded. 183 companies have only 11 or 10 years of accounting data. 1211 companies have 9 years or less. Finally, column 10 shows that 28 companies were mentioned twice. (Note: Datastream is our source for this analysis).

So far, a total of 359 alive and 1063 dead companies constitute what has been referred to as the primary main sample, each of them having accounting data for at least 12 years. And therefore 1422 represent the total number of companies included in the primary sample of this study.

Table 4.4 summarises main figures in tables 4.2 and 4.3, and their totals, leading the derivation of the total number of the primary main sample, i.e., 1422 companies.

Note that the sample that has been obtained so far has been described as 'primary' indicating that there is still a chance for more company exclusions. As a matter of fact, the last issue needs to be checked before obtaining the final sample is to make sure that every single company to be evaluated by this study in a specific year has returns data records on LSPD by the time returns are measured for the decile it belongs to. If a firm has all the accounting data required and has been found on LSPD but with a return record that starts after the date specified to begin measuring returns for the group of companies the firm belongs to, this will inevitably lead to excluding such a firm from the sample.

TABLE 4.4

A SUMMARY FOR ALL THE UK COMPANIES (ALIVE+DEAD) AS IN DECEMBER 2006.

(THIS TABLE COMBINES THE LAST LINE IN TABLE 4.2 AND THE LAST LINE IN TABLE 4.3).

DESCRIPTION	*NOT-ACCEPTED SECTORS*	*ACCEPTED SECTORS*						*TOTALS **
	Column(2)	Columns (4)+(5)	Column(6)	Column(7)	Column(8)	Column(9)	Column(10)	All Columns
Totals from Table 4.2 (UK-ALIVE)	540	359	4	105	52	1449	0	*2509*
Totals from Table 4.3 (UK-DEAD)	424	1063	22	51	183	1211	28	*2982*
TOTALS OF ALL ALIVE & DEAD FIRMS	*964*	*1422 ***	*26*	*157*	*235*	*2659*	*28*	*5491*

Note that definitions of columns (2), (4), (5), (6), (7), (8), and (9) in this table for each of the UK-ALIVE and UK-DEAD companies, are those for the same columns in tables (A) and (B), respectively.

Where:

* Shows totals for the not-accepted and accepted sectors for both of the alive and the dead companies.

** Shows the total number of companies we start our analysis with (alive & dead).

Companies that have at least the minimum required years of accounting data on Datastream (i.e., 1422) are matched with LSPD according to the following procedure.

As a first step, companies on the databases are matched by the exact name. For that purpose the file lspdN is used. That file gives all different names for a company. For the rest of the companies that could not be sorted out in the first step (most of them because of minor differences, e.g., one data base includes/excludes words such as Co, & son, group, plc., accompanied with the name of company, while the other database does not/does), two of the following, at least, are checked:

(1) The SEDOL number for companies on both databases. While this is available for all companies on LSPD, it is available only for the alive companies on Datastream. (Sedol numbers in LSPD are values of G15 of the file lspd G).

(2) The date of death, delisting, for dead companies, if available on both data bases. Unfortunately, it is available for just a minor percentage of dead companies on Datastream.

(3) The name of succeeding companies for dead firms (when applicable, i.e., after mergers, takeovers,..). If these are available on Datastream (just for dead companies), then they are available on LSPD under column (N8) of the file lspdN that describes the Sedol number of the succeeding share or company. As a matter of fact, this comparison was very useful for many cases in condition the new company (e.g., the acquiring company) is also listed on LSPD.

(4) Sectors of companies. Company sectors in LSPD are under G16 of the file lspdG.

(5) The starting and ending dates of data records for companies on Datastream are checked with M2 (Birth month) and M3 (Death month) of the file lspdM on LSPD.

(6) Finally, as a last resort, the database FAME is used to match 7 cases which could not be matched using Datastream and LSPD.

4.4 The Four Minor Samples: Sample (A), Sample (B), Sample (C), and Sample (D). Reason and Method

As in every study investigating the effect of accounting data on stock returns, deciding on the event window (the period during which the return response to a specific accounting variable is observed) is a central concern. *Ideally*, measuring returns caused or affected by a hypothesised specific accounting variable should start immediately at the time such accounting information is made available to investors. Measuring returns related to a specific accounting variable starting before or after the ideal time for that variable can cause problems. Such problems can lead a researcher to observe the aggregate result of different relationships among stock returns and many accounting and/or other explanatory variables. In a return-accounting context, this could lead to relating returns in a specific period to (x) accounting explanatory variable rather than or in addition to the correct accounting variable (y) or even (z).

In the UK, two issues influence when to start calculating returns. The first concerns the laws that allow companies a maximum period of six months after their financial year ends to officially publish their accounts. The second concerns the fact that companies do not commit themselves in preparing their accounts to a same financial year *end* or to the calendar year-end dates, that is as at Dec 31. (i.e., UK companies can have their financial year end as at the end of any working day during any month from Jan to Dec).

To clarify the point here, let us consider the following two companies: company (A) has its accounting year-end as at Jan 31, each year. Company (B) has its accounting year-end as at Dec 31, each year. Let's also suppose another reasonable assumption that both companies officially publish their accounts four months after the date of their financial year-ends (i.e., two months before the maximum period granted by law).

Keeping in mind the six months allowed to publicly publish accounting data, if we consider the *calendar year* t in which the financial year end falls rather than the *month* of the financial year end to start measuring companies' returns then for both companies (A) and (B) returns can be calculated as from Jul 1 year t+1. In such a case, measuring returns for company (A) can suffer dramatically. More directly, company's (A) actual starting date for estimating returns [as being hypothesised to be affected by year's t accounting data], will be due two months after that's company year t+1 accounting releases. In such a case, there is overlap between the second accounting release date and the period in which returns for the first accounting release date is estimated. As a result, returns in year t+1 will be estimated and improperly related to year's t instead of year's t+1 accounting releases.

On the other hand, if we to consider the *month* of the financial year end rather than the *calendar year* t in which the financial year end falls, the above distortion will obviously be alleviated.

From the preceding example, it is the case that to minimize the risk regarding relating any abnormal returns improperly to the wrong accounting variable, decile portfolios should be formed on a monthly basis rather than a calendar year basis. As a matter of fact, doing so (i.e., forming portfolios on monthly basis) will affect all of the tests through reducing the number of observations in each test period (i.e., month) to such a low level that it can be very difficult to create deciles.

Consequently, there is a need to compromise between the advantage of forming portfolios on a monthly basis on the accuracy of the results regarding measuring the returns, with the accompanied disadvantage of possibly having very low and unmanageable number of observations in each test period and in each decile. To overcome this problem and consider better options to form portfolios, a separate analysis for the distribution of company-years for the whole sample companies (alive+dead) that meet the condition of having accounting data for 12 years or more (i.e., the primary main sample that consists of 1422 stocks) has been conducted, considering the *month* in which those companies have their financial year ends, over a period extends from 1968 to 1990. The following has been revealed:

(1) The primary total number of companies that publish their accounts any month within the first quarter of the year (Jan-Mar), any month within the second quarter of the year (Apr-Jun), any month within the third quarter of the year (Jul-Sep), or any month within the fourth and last quarter of the year (Oct-Dec), is 441, 175, 194, and 612 companies, respectively, over the whole study period.

(2) The total number of company-years (CYs) for the whole period is 10571 CYs. This number represents the CYs for the primary main sample.

(3) The total number (percentage of total number) of CYs for each quarter is: 3330 (32%), 1162 (11%), 1501 (14%), and 4578 (43%) CYs, for the first quarter to the fourth quarter, respectively, over the whole period of 23 years.

Based on the above evidence it is clear that most of the companies and company-years have their financial year ends either at the beginning or at the end of the calendar year, and so any consideration of the calendar year of the financial year end rather than the month of financial reporting to start calculating returns will raise a big question mark regarding the accuracy of the results for all the companies that have their financial year ends within the first six months of the calendar year, and more importantly to those within the first quarter. Note that accepting the principle of considering the calendar year of the financial year end is equivalent to accepting analysing the primary main sample as a whole (i.e., as it is). On the other hand, accepting the principle of considering the month or the quarter of financial reporting as a basis to calculate returns is equivalent to accepting the principle of partitioning the primary main sample into minor samples, each of them then will be tested separately.

And so, the primary main sample (i.e., 1422 stocks) has been portioned into four minor samples labelled: sample (A), sample (B), sample (C) and sample (D).

- ❖ Sample (A) includes all the companies that have their year ends in the first quarter of the year (Jan-Mar). This sample includes primarily 441 shares.
- ❖ Sample (B) includes all the companies that have their year end in the fourth quarter (Oct-Dec), these are primarily 612 companies.
- ❖ Samples (C) includes companies that have their financial year ends in any month within the first half (Jan-Jun), these are primarily 605 companies {that is equal to companies that have their financial year end in the first quarter which is equivalent to saying those in sample (A) 441 companies, minus 11 *[companies in sample (A) but could not join sample (C) as they do not have returns data three months later, i.e., as at the time portfolios for sample (C) are formed]*, plus 175 companies that have their financial year end any month within the second quarter of the year}.
- ❖ Sample (D), includes companies that have their financial year ends in any month within the second half (Jul-Dec) of the year. Sample (D) includes primarily 806 companies, of them 612 contribute to sample (B), and the rest, 194 companies, have their financial year end any month within the third quarter of the year.

Finally, to determine on the actual companies in each sample we check on the starting date of return records for each of the 1422 companies to make sure that using LSPD there is return data for each company-year as at the time of its formation date, since actual inclusion of any company of these 1422, within its sample, is conditional on companies having return records one month from portfolios' formation dates. This procedure led to the exclusion of a total of 27 companies, distributed as 6, 3, 5, and 13 relative to their quarters, the first, the second, the third and the fourth, respectively.

As appears in table 4.5, this study works on a final total number of 1395 different companies,

TABLE 4.5

NUMBERS OF COMPANIES PUBLISHING THEIR ACCOUNTS WITHIN THE FIRST, SECOND, THIRD, AND FOURTH QUARTERS OF THE YEAR. AND THE ACTUAL NUMBERS OF COMPANIES AND COMPANY-YEARS TESTED WITHIN EACH OF THE SAMPLES (A, B, C, AND D) OVER THE PERIOD (1968-1990)

Description / Sample/ Period	*Sample (A) first quarter (Jan-Mar)*	*Second Quarter (Apr-Jun)*	*Third Quarter (Jul-Sep)*	*Sample (B) Fourth Quarter (Oct-Dec)*	*The Whole Period (Jan-Dec)*
Primary total number of companies (1968-1990)	441	175	194	612	**1422**
Companies excluded [1]	-6	-3	-5	-13	**-27**
Actual (Final) number of companies (1968-1990)	***435***	***172***	***189***	***599***	**1395**

Description / Sample/ Period	*Sample (A) first quarter (Jan-Mar)*	*Sample (B) Fourth Quarter (Oct-Dec)*	*Sample (C) First Half (Jan-Jun)*	*Sample (D) Second Half (Jul-Dec)*	*The Whole Period (Jan-Dec)*
Actual (Final) number of companies (1968-1990)	*435*	*599*	*596* [2]	*788* [3]	**1395**
Total number of firm-years (1968-1990) [4]	*3330*	*4578*	*4492* [5]	*6079* [6]	**18479** [7]
Percentage of total number of firm-years (68-90)	*18%*	*25%*	*24%*	*33%*	**100%**
** Maximum number of firm-years. On yearly basis.*	*217*	*274*	*285*	*364*	
** Minimum number of firm-years. On yearly basis.*	*116*	*156*	*159*	*210*	
** Avg. number of firm-years. On yearly basis.*	*145*	*199*	*195*	*264*	

Where:

1 : These represent companies with available accounting data & were matched with LSPD, but return records were not available by the time we wanted to perform the tests.

2 596: Is equal to final number of companies for the first quarter [i.e., sample (A)=435] minus (-11) companies in sample (A) but have not return records as in January year (t+1), plus final number of companies for the second quarter (172).

3 788: Is equal to final number of companies for the third quarter (189), plus final number of companies for the fourth quarter [i.e., sample (B)= 599].

4 : This line shows total number of company-years for the four samples. It shows that a total of 18479 company-years are tested for the 1395 different companies within the four samples.

5 4492:This number is equal to 3330 company-years from sample (A) source plus 1162 company-years from the second quarter source.

6 6079:This number is equal to 4578 company-years from sample (IB) source plus 1501 company-years from the third quarter source.

7 : Note that the actual (without duplication) total number of company-years for the whole period is (10571) which equal to (18479) minus (3330) to avoid repeated firms in sample (A), and minus (4578) to avoid repeated firms in sample (B). Equivalently, (4492) plus (6079) company-years from samples (C) and (D), respectively.

* : Table 4.6 shows complete set of actual numbers of companies included at each of the 23 formaion dates for each sample (A, B, C, and D).

split into four distinct samples; these are sample (A), sample (B), sample (C), and sample (D). The *final* total number of companies for each sample is: 435 (441-6), 599 (612-13), 596 (605-6-3), and 788 (806-5-13) companies, respectively. And the final total number of company-years is 3330, 4578, 4492, and 6079, respectively[9+10]. For each of the samples a *separate* identical analysis is conducted according to the following general frame to estimate any abnormal accruals and any related abnormal returns for periods extending to 36 months:

Test Periods	*Sample used*	*Ten-year-intervals for regression purposes*	*Date to estimate abnormal accruals*	*Period to estimate abnormal returns*
1	(A)	1968 to 1978	1979	Oct, 79 to Sep, 82
	(B)	1968 to 1978	1979	Jul, 80 to Jun, 83
	(C)	1968 to 1978	1979	Jan, 80 to Dec, 82
	(D)	1968 to 1978	1979	Jul, 80 to Jun, 83
.				
23	(A)	1990 to 2000	2001	Oct, 01 to Sep, 04
	(B)	1990 to 2000	2001	Jul, 02 to Jun, 05
	(C)	1990 to 2000	2001	Jan, 02 to Dec, 04
	(D)	1990 to 2000	2001	Jul, 02 to Jun, 05.

Table 4.6 shows the final number of companies included in each of the four samples (A, B, C and D). It also summarises statistics for each of the 23 portfolio formations, e.g., the lowest, highest, and average numbers of firms being tested.

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[9] We use Advanced Excel and Matlab programming to deal with large quantitative data.

[10] Names of companies for each sample accompanied with their G1 number as given by LSPD is enclosed in Appendix 1.

TABLE 4.6

ACTUAL NUMBERS OF COMPANIES INCLUDED IN THE SAMPLES (A, B, C, and D) FOR THE 23 PORTFOLIO FORMATION PERIODS

This table shows the actual number of firms in each of the 23 portfolio formations (from columns: 1-23) for the samples (A, B, C, and D). It also shows the lowest, highest and average numbers of firms in the different formations as appears in columns 24, 25, and 26, respectively. Finally, we report total number of different companies and company-years tested in the samples in columns 27 and 28, respectively.

SAMPLE \ PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
SAMPLE (A)	128	155	154	140	217	209	210	181	154	139	122	116	124	120	122	117	119	119	119	129	148	148	140
SAMPLE (B)	157	181	177	173	274	272	247	219	205	185	168	156	179	177	174	173	191	202	192	216	227	218	215
SAMPLE (C)	161	188	189	175	285	277	285	241	211	192	169	159	165	162	164	160	165	168	166	186	210	211	203
SAMPLE (D)	210	244	237	231	364	362	325	295	276	248	227	213	241	233	230	230	250	262	251	281	295	290	284

Actual lowest number of firms in each sample over the 23 portfolio formations	Actual highest number of firms in each sample over the 23 portfolio formations	Actual average number of firms in each sample over the 23 portfolio formations	Actual number of different firms in each sample over the 23 portfolio formations	Actual number of firm-years included in each sample[1]
116	217	145	435	3330
156	274	199	599	4578
159	285	195	596	4492
210	364	264	788	6079

Where:

1 : These can be obtained by adding the numbers in each row for each sample separately over the 23 test periods.

4.5 The Four Samples' Market Indices

Adjusting sample portfolios' raw returns by suitable benchmark returns is the main approach used in this study to estimate any abnormal returns. For a major part of the tests conducted, market portfolio raw returns are used as the benchmark returns.

Since this study employs a significant portion of the shares listed on LSE and those quoted on AIM, but not all of the shares, creating its own market index in a manner similar to that employed constructing the samples has been seen to be essential.

To create its market portfolios this study employs the following procedure:

- All companies listed on LSE or quoted on AIM apart from banks, financial institutions and firms in regulated industries (e.g. utilities) are included in the market portfolios. Real estate companies are also excluded because of the distinct nature of their accruals and financial statements.
- Once a market portfolio has been formed at any specific sample's decile formation date to match its returns, no more shares (i.e., new listing shares) are allowed to join in the market portfolio within the same test period. As a result, this study creates a distinct *market* portfolio for each distinct *sample* portfolio within each distinct *sample* [i.e., samples: (A), (B), (C) and (D)]. More specifically, this study has 92 market portfolios formation dates (4 samples times 23 portfolio formation dates for each sample), each of them has the same formation date as that of the sample portfolio with which it is matched. At any of the 92 formation dates, shares with return records regardless of the length of these records (even if it is just one month) are included in the market portfolio formed at that formation date.

  And so, this methodological treatment regarding not accepting new listed companies to join existing market portfolios has imposed the need for a huge number of market portfolios (i.e., 92 market portfolios) since in every month some shares are likely to emerge while some others cease to continue. Not accepting new listing companies to join existing market portfolios has two advantages:

1. It leads to better comparability (i.e., consistency) with sample portfolios. This occurs since the sample portfolios themselves are created on that basis.
2. Avoids any *new listing* bias. The new listing bias arises if returns of companies that join the market after a sample portfolio formation date are different on average than that of the market before their listing, market return within the test period will be shifted. Ritter (1991, p. 3) argues that "*the underpricing of IPOs that has been widely documented appears to be a short-run phenomenon*". The researcher proposes that companies that go public underperform the market index benchmark, leading to positive bias.

- In a final step, shares with return records are considered as long as their market values (i.e., capitalisation) are available. Therefore, to *actually* include any share in any of the 92 market portfolios formation dates, that share's market value should be available as at the formation date of its intended market portfolio. Although this condition did not significantly affect the number of companies in different market portfolios, since in the majority of cases shares have both return and size data at the same time, it could not be avoided since shares' market capitalisations are required for market portfolios' value-weighted return calculations. As a matter of fact, this condition did not cause any limitations on selecting shares in sample portfolios because all the shares included by the four samples were found to have size data as at the different formation dates through the study period.

Table 4.7 summarises the number of company-years included in each market portfolio.

TABLE 4.7

ACTUAL NUMBERS OF COMPANIES INCLUDED IN THE SAMPLES' (A, B, C, and D) MARKET-INDICES OVER THE 23 PORTFOLIO FORMATION PERIODS

This table shows the actual number of firms in each of the 23 portfolio formations (from columns: 1-23) for the samples' (A, B, C, and D) market-indices. It also shows the lowest, highest and average numbers of firms in the different formations as appears in columns 24, 25, and 26, respectively. Finally, we report total number of different companies and company-years tested in the samples' market-indices in columns 27 and 28, respectively.

SAMPLE \ PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MARKET-INDEX (A)	1646	1634	1635	1610	1605	1594	1607	1561	1618	1671	1684	1664	1628	1587	1592	1682	1795	1871	1923	1865	1719	1789	1838
MARKET-INDEX (B)	1648	1642	1622	1603	1587	1595	1566	1602	1670	1694	1673	1636	1590	1591	1678	1739	1856	1934	1888	1745	1756	1842	1835
MARKET-INDEX (C)	1665	1632	1637	1604	1603	1587	1615	1587	1631	1679	1695	1659	1614	1585	1632	1725	1815	1907	1924	1833	1723	1827	1842
MARKET-INDEX (D)	1648	1642	1622	1603	1588	1595	1566	1602	1670	1694	1673	1636	1590	1591	1678	1739	1856	1934	1888	1745	1756	1842	1835

Actual lowest number of firms in each sample's market-index over the 23 portfolio formations	Actual highest number of firms in each sample's market-index over the 23 portfolio formations	Actual average number of firms in each sample's market-index over the 23 portfolio formations	Actual total number of different firms in each sample's market-index	Actual number of firm-years included in each sample's market-index[1]
1561	1923	1688	4053	38818
1566	1934	1695	4103	38992
1585	1924	1697	4084	39021
1591	1888	1695	4103	38993

Where:

[1] : These can be obtained by adding the numbers in each row for each sample separately over the 23 test periods.

Note (1) : The total number of different firms included in the four samples' market-indices is 4177 firms.

4.6 The Four Samples' Book-to-Market Control Portfolios

As was mentioned before, this study tends to estimate any abnormal returns for the different abnormal accruals deciles through adjusting their raw returns with suitable benchmark returns. While in the prior section samples' returns were adjusted using market portfolio returns, in this section they will be adjusted using book-to-market control portfolios' returns.

In a similar procedure to that used in creating 92 market portfolios, we create 92 book-to-market portfolios (for each of the 92 distinct sample portfolios). The same criteria for excluding in the last section were also used to exclude from the book-to-market control portfolios. Also, all new listing firms are not included in existing book-to-market control portfolios.

For a company to be included in a book-to-market benchmark portfolio, two kinds of data are required: (i) accounting data regarding its *book value*, and (ii) *return* data as at the formation date.

Unfortunately, LSPD does not provide book-to-market ratios or any relevant accounting information for the companies included in their database. On the other hand, Datastream does provide that kind of data, but just for small percentage of the overall number of companies quoted on LSE and AIM.

As a high proportion of the companies with available data on Datastream have been used in the samples (A, B, C, and D), *with limitation*, companies that are included in the book-to-market control portfolios in this study are the same companies included in the four samples (A, B, C, and D) together, i.e., a total of 1422 different companies.

Table 4.8 summarises the number of company-years included in each book-to-market control portfolio.

TABLE 4.8

ACTUAL NUMBERS OF COMPANIES INCLUDED IN THE SAMPLES' (A, B, C, and D) BOOK-TO-MARKET FORMATIONS FOR THE 23 TEST PERIODS

This table shows the actual number of firms in each of the 23 portfolio formations (from columns: 1-23) for the samples' (A, B, C, and D) market-indices. It also shows the lowest, highest and average number of firms in the different formations as appears in columns 24, 25, and 26, respectively. Finally, we report total number of different companies and company-years tested in the samples' market-indices in columns 27 and 28, respectively

SAMPLE \ PERIOD	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
** BOOK-TO-MARKET FORMATIONS-SAMPLE (A)*	292	867	912	898	887	867	869	814	804	880	919	923	906	876	855	832	811	785	754	697	630	557	510
BOOK-TO-MARKET FORMATIONS-SAMPLE (B)	850	913	900	891	865	867	820	797	861	911	930	916	882	861	840	816	792	768	709	646	574	519	482
BOOK-TO-MARKET FORMATIONS-SAMPLE (C)	390	865	907	894	879	857	862	806	813	881	915	921	896	870	851	831	801	785	739	684	610	538	501
BOOK-TO-MARKET FORMATIONS-SAMPLE (D)	850	913	900	891	865	867	820	797	861	911	930	916	882	861	840	816	792	768	709	646	574	519	482

Actual lowest number of firms in each sample's book-to-market formations	Actual highest number of firms in each sample's book-to-market formations	Actual average number of firms in each sample's book-to-market formations	Actual total number of different firms in each sample's book-to-market formations	Actual number of firm-years included in each sample's book-to-market formations[1]
292	923	789	1419	18145
482	930	800	1418	18410
390	921	787	1416	18096
482	930	800	1418	18410

* Note that reason for low number of observations being tested in the *first* formation period in sample (A) is due to the nature of this index. This index is formed from all different companies in the four samples (A, B, C, and D). With the earliest portfolio formation dates being for sample (A), this index includes firms only from sample (A) for the first formation in this sample.

Where:

1 : These can be obtained by adding the numbers in each row for each sample's book-to-market formations separately over the 23 test periods.

4.7 Method for Estimation of Abnormal Accruals. Model Used and Definitions of Variables

The firm-specific time-series Modified Jones Model suggested by Dechow et al (1995) is used to estimate a share's abnormal accruals over two stages. In the first stage (the estimation period) shares' total accruals as hypothesised being normal are regressed using the MJM on two proposed normal accruals drivers; these are revenues adjusted for receivables and property, plant and equipment. In the second stage (the event period), once coefficients for the two mentioned explanatory variables have been obtained, normal accruals are estimated using actual explanatory variables' data of the event period. A share's abnormal accruals in the event year is equal to the variance between actual and estimated accruals.

Mathematically, abnormal accruals in this study [as represented in Eq.(16) in section 3.3.4.1 of chapter three] are estimated by matching actual accruals [employing Eq.(1) that was first introduced in chapter three] with estimated normal accruals [employing the fitted regression of Eq.$^{/}$(15), mentioned in chapter three].

As was emphasised in chapter three, consistent with previous studies of earnings management [Healy (1985), Jones (1991) Dechow et al (1995), Sloan (1996), and Houge and Loughran (2000)], a share's total accruals are calculated as follows:

$$\mathbf{TA_{it}/A_{it-1} = (\Delta CA_{it} - \Delta CL_{it} - \Delta Cash_{it} + \Delta STD_{it} - Dep_{it})/(A_{it-1})} \qquad (1)$$

Where [11(next page)]:

TA = total accruals

ΔCA = change in current assets.

ΔCL = change in current liabilities.

Δcash = change in cash and cash equivalent.

ΔSTD = change in debt included in current liabilities.

Dep = depreciation and amortization expense.

A = total assets.

t = current year.

i = firm i.

As a matter of fact, total accruals are calculated as the change in non-cash working capital before income taxes payable less total depreciation expense. The change in non-cash working capital before taxes is defined as the change in non-cash and non-cash equivalent current assets less current liabilities other than current maturities of long-term liabilities and income taxes payable. This is a similar definition to that of Jones (1991).

Regarding the exclusion of short-term maturities of long-term (debt in current liabilities) and income taxes payable, Sloan (1996, p. 293) clarifies "*debt in current liabilities is excluded from accruals because it relates to financing transactions as opposed to operating transactions. Income taxes payable is also excluded from accruals for consistency with the definition of earnings employed in the empirical tests*".

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[11] Variable references as they presented in Datastream and used in this study:

- Current Assets (C.A): 376.
- Current Liabilities (C.L): 389.
- Cash and cash equivalent (Cash): 375.
- Short Term Debts (STD): 309 'borrowings repayable within 1 year' ,plus 318 'short-term loans'.
- Depreciation and amortisation expense (Dep): 136 'depreciation', plus 975 'amortisation of intangibles'.
- Total Assets (A):
    1. If the company is ALIVE: WC02999 'total assets'.
    2. If the company is DEAD it is calculated as follows: 376 'current assets', plus 330 'total fixed assets-gross', plus 344 'total intangibles', plus ' 356 'total investments (including associates)', plus 359 'other assets'.

To estimate any abnormal accruals for any of the 23 formation years the following procedure is employed for all of the four samples:

First: Actual total accruals are calculated through applying Eq.(1) at the firm level using time-series of observation for at least 11 years, starting with (1968-1978), the first formation year 1979, and ending with (1990-2000), the last formation year 2001.

By applying Eq.(1) to any of the samples, the following 32 equations will be calculated:

$$\mathbf{TA_{69/}A_{68} = (CA_{69\text{-}68} - CL_{69\text{-}68} - Cash_{69\text{-}68} + STD_{69\text{-}68} - Dep_{69})/\ (A_{68})} \quad (1\text{-}1)$$

$$\mathbf{TA_{70/}A_{69} = (CA_{70\text{-}69} - CL_{70\text{-}69} - Cash_{70\text{-}69} + STD_{70\text{-}69} - Dep_{70})/\ (A_{69})} \quad (1\text{-}2)$$

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$$\mathbf{TA_{99/}A_{98} = (CA_{99\text{-}98} - CL_{99\text{-}98} - Cash_{99\text{-}98} + STD_{99\text{-}98} - Dep_{99})/\ (A_{98})} \quad (1\text{-}31)$$

$$\mathbf{TA_{00/}A_{99} = (CA_{00\text{-}99} - CL_{00\text{-}99} - Cash_{00\text{-}99} + STD_{00\text{-}99} - Dep_{00})/\ (A_{99})} \quad (1\text{-}32)$$

Second: parameters of the normal accruals MJM equation, Eq.$^{/}$(15), are estimated according to the following regression:

$$\mathbf{TA_{it}/A_{it\text{-}1} = \alpha_i\ [1/A_{it\text{-}1}] + \beta_{1i}\ [(\Delta REV_{it} - \Delta REC_{it})/A_{it\text{-}1}] + \beta_{2i}\ [PPE_{it}/A_{it\text{-}1}] + \varepsilon_{it}} \quad {}^{/}(15)$$

Where [12+13]:

ΔREV_{it} = revenues in year t less revenues in year t_{-1} for firm i.

---

[12] Variable references as they presented in Datastream and used in this study:

- Revenues (Rev): 104 'total sales'.
- Receivables (Rec): 367 'debtors'.
- Gross Plant, Property and Equipment (PPE): 330 'total fixed assets'.

[13] Jones (1991, 211) clarifies that since that model is used to estimate normal accruals, therefore, "*levels of total accruals rather than the changes in total accruals is used in this equation*".

ΔREC_{it} = net receivables in year t less net receivables in year t_{-1} for firm i.

PPE_{it} = gross property, plant, and equipment in year t for firm i.

The rest of the variables in Eq. $'(15)$ are defined as in Eq.(1).

To estimate parameters in Eq$'(15)$ ordinary least squares is applied. A procedure by which the following equations according to the above mentioned year-intervals are observed:

$$TA_{69}/A_{68} = Eq.\ (1\text{-}1) = \alpha\,[1/A_{68}] + \beta_1\,[(REV_{69\text{-}68} - REC_{69\text{-}68})/A_{68}] + \beta_2\,[PPE_{69}/A_{68}] + \varepsilon_{69} \quad '(15\text{-}1)$$

$$TA_{70}/A_{69} = Eq.\ (1\text{-}2) = \alpha\,[1/A_{69}] + \beta_1\,[(REV_{70\text{-}69} - REC_{70\text{-}69})/A_{69}] + \beta_2\,[PPE_{70}/A_{69}] + \varepsilon_{70} \quad '(15\text{-}2)$$

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$$TA_{99}/A_{98} = Eq.\ (1\text{-}31) = \alpha\,[1/A_{98}] + \beta_1\,[(REV_{99\text{-}98} - REC_{99\text{-}98})/A_{98}] + \beta_2\,[PPE_{99}/A_{98}] + \varepsilon_{99} \quad '(15\text{-}31)$$

$$TA_{00}/A_{99} = Eq.\ (1\text{-}32) = \alpha\,[1/A_{99}] + \beta_1\,[(REV_{00\text{-}99} - REC_{00\text{-}99})/A_{99}] + \beta_2\,[PPE_{00}/A_{99}] + \varepsilon_{00} \quad '(15\text{-}32)$$

The values (TA_{it}/A_{it-1}) to the left-hand side are obtained by using Eq. (1) as has been shown in the first step. Using *historical* accounting data for each of $(\Delta REV_{it}, \Delta REC_{it}, PPE_{it})$ for parallel periods to those used to calculate the left hand side values (i.e., (TA_{it}/A_{it-1})), the above regressions can be evaluated to estimate the actual parameters $(\alpha_i, \beta_{1i}, \beta_{2i})$ in Eq. $'(15)$ through the values $(a_i, b_{1i}$, and $b_{2i})$, respectively. As a matter of fact, for each firm-year from 1979 to 2001 a specific *fitted* phase of Eq. $'(15)$ is estimated for purposes of this research.

Third: abnormal accruals for each firm-year as from 1979 to 2001 are estimated using Eq. (16) that was introduced in chapter three. Eq.(16) represents the corresponding MJM accruals prediction errors, and is defined in the same way as in section 3.3.4.1 of chapter three:

Eq (1) —————— fitted Eq (15) ——————

$$U_{it} = TA_{it}/A_{it-1} \quad - \quad (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}]) \tag{16}$$

Eq. (16) matches between Eq. (1) that calculates the *actual* total accruals and the fitted phase of Eq$'$(15) that estimates the *normal* accruals for a specific firm-year. As a result, the following 23 estimates of U_{it} (i.e., firm-years abnormal accruals) will be observed over the whole study test period:

$$U_{i79} = TA_{i79}/A_{i78}[Eq.\ (1\text{-}11)] - \{a_{i79}[1/A_{i78}] + b_{1i79}[(REV_{i79\text{-}78} - REC_{i79\text{-}78})/A_{i78}] + b_{2i79}[PPE_{i79}/A_{i78}]\} \tag{16-11}$$

$$U_{i80} = TA_{i80}/A_{i79}[Eq.\ (1\text{-}12)] - \{a_{i80}[1/A_{i79}] + b_{1i80}[(REV_{i80\text{-}79} - REC_{i80\text{-}79})/A_{i79}] + b_{2i80}[PPE_{i80}/A_{i79}]\} \tag{16-12}$$

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$$U_{i00} = TA_{i00}/A_{i99}[Eq.\ (1\text{-}32)] - \{a_{i00}[1/A_{i99}] + b_{1i00}[(REV_{i00\text{-}99} - REC_{i00\text{-}99})/A_{i99}] + b_{2i00}[PPE_{i00}/A_{i99}]\} \tag{16-32}$$

$$U_{i01} = TA_{i01}/A_{i00} \quad - \{a_{i01}[1/A_{i00}] + b_{1i01}[(REV_{i01\text{-}00} - REC_{i01\text{-}00})/A_{i00}] + b_{2i01}[PPE_{i01}/A_{i00}]\} \tag{16-33}$$

Equations (1), $'$(15) and (16) are deflated by the lagged total assets to ameliorate the problems associated with Heteroscedasticity, e.g., Wells (2002), Saleh and Ahmed (2005), and Zhong et al. (2007). Heteroscedasticity and the option of using TA (a measure of the firm size) to relax heteroscedasticity is discussed in the following chapter of methodology.

4.8 Summary

Focusing on a long period, from January 1968 to June 2005, to explore the profitability and consistency of the accrual anomaly in UK firms, this study uses a large and updated set of data.

Two data bases are employed by this research. Accounting data for purposes of estimating abnormal accruals are obtained from the Datastream data base, and share return data is obtained from LSPD.

The method used to form the sample including the procedure employed to match the data on Datastream with this on LSPD is clarified in this chapter.

The need for creating four minor samples (A, B, C, and D) instead of studying one main sample, and for forming four sample-related market indices instead of considering one market index, are also emphasised.

Finally, we address specifications and method of the MJM used to detect earnings management. i.e., abnormal accruals.

CHAPTER FIVE

RESEARCH METHODOLOGY "TWO"

5.1 Introduction

Six main steps are the focus of this chapter. All of them are either related to the sample portfolios' abnormal returns estimation process, or associated with return-related risk factors. These steps are:

- Introduction to return estimation.

- Defining the Buy-and-Hold Abnormal Returns (BHARs) equation, and (i) the *equally* and (ii) *value-weighted* methods used to calculate portfolios' returns. These two methods are commonly employed to weight shares' returns within portfolios.

  From another aspect, reinvesting money released by deleted companies (i.e., companies that ceased being quoted) for reasons such as mergers and takeovers which leave value in the shares is also clarified.

- Approaches for estimation of abnormal returns.

  Three main approaches to estimate abnormal returns are used:

  - The first estimates *benchmark returns* to adjust sample deciles' returns.
  - The second adjusts for *beta risk* through the Capital Assets Pricing Model (CAPM).
  - We also, apply the three-factor model of Fama and French (1993).

- Further risk analysis is conducted by calculating sample deciles'

  - Standard deviations.
  - A year-by-year reliability analysis, and
  - Deletion and liquidation rates.

- The merits and demerits of buy-and-hold abnormal returns BHAR versus cumulative abnormal returns (CAR) are discussed.

- The influence of 'heteroscedasticity' on statistical inferences and how it can be minimized is also discussed.

5.2 Introduction to Return Estimation

As has been mentioned sample portfolios' returns are adjusted in this study using three main approaches: the benchmark, the beta risk CAPM, and the Fama and French's three factor model (FF). Using a variety of methods to measure the abnormal accruals anomaly increases the robustness of conclusions as to whether the abnormal accruals anomaly persists. Under the *benchmark* approach sample portfolios' buy-and-hold adjusted returns are estimated using four different methods: (1) market-adjusted buy-and-hold returns, (2) size-adjusted buy-and-hold returns, (3) book-to-market-adjusted buy-and-hold returns, and (4) size-and-book-to-market-adjusted buy-and-hold returns.

Alternatively, under the *beta* risk approach, another three methods are used: (1) the monthly average raw returns of market portfolios are used to examine abnormal returns in the first method. In the related literature any abnormal returns obtained by this method are referred to as Jensen Alpha. In the second and third methods under the beta risk approach a methodology similar to that used in estimating the *standard* Jensen Alpha but, with modification is applied. So that, instead of using the market portfolios' returns (as in Jensen Alpha) in the second method monthly average raw returns of size control (matching) portfolios are considered to adjust for any abnormal returns, and in the third monthly average raw returns of book-to-market control (matching) portfolios are employed to adjust the sample portfolios' raw returns.

In the third approach for estimating abnormal returns, we apply the model introduced by Fama and French (1993, and 1996). According to their view a share portfolio's return premium (defined as the monthly average raw returns on the portfolio minus the corresponding monthly treasury bills rate of return) is a function of the monthly average raw returns on a broad market portfolio minus the corresponding monthly treasury bills rate of return and another two risk factors; the firm size and the book-to-market ratio. In their opinion these two factors signal financial distress.

For the first two approaches used to adjust sample portfolios' returns (i.e., the benchmark and CAPM), sample portfolios' raw returns are calculated in two ways: in the first; sample portfolios' returns are considered on an equally-weighted (E.W.) basis, while in the second they are considered on value-weighted (V.W.) basis.

When the *benchmark* approach is employed except for when we use the size-and-book-to-market method. an equally/value-weighted benchmark returns of all shares in the benchmark is used to adjust sample portfolios' returns that have been prepared on an equally/ value-weighted basis, respectively. In the same way, when the (CAPM) is used sample portfolios' returns are calculated on an equally/value-weighted basis, when returns of the adjusting factor (i.e., the market index / or the size-control portfolio/ or the book-to-market control portfolio) have been calculated on an equally/ value-weighted basis, too.

However, we only use the value-weighted method for calculating returns for both of the size-and-book-to-market test and the FF model. The reason for using only value-weighted basis is that we follow the same methodology first proposed by Fama and French (1993) as they introduced these two tests. Fama (1998) emphasises that the value weighting improves the ability to predict stock returns.

In summary, abnormal returns for each of the 92 sample portfolio formation dates are estimated using 14 main methods: the first *12* of them are as follows: [2 approaches (i.e., the benchmark & beta risk) times 3 methods for each approach (i.e., market portfolios, size-control portfolios, & book-to-market control portfolios) times 2 weighting methods (equally & value-weighted)]. In addition to applying the size-and-book-to-market control and the FF methods.

When the benchmark approach is used to estimate abnormal returns, sample portfolios' adjusted buy-and-hold returns are reported for periods of: (1) the first 12 months as from portfolios' formation dates, (2) the second 12 months as from portfolios' formation dates, (3) the third 12 months as from portfolios' formation dates, (4) the first 24 months as from portfolios' formation dates, and finally (5) the whole test period; 36 months as from portfolios' formation dates. On the other hand, when the *beta* risk adjusting approach or the FF three factor model are used, the results of samples' abnormal returns are presented for three distinct periods: (1) the first 12 months after the portfolios' formation dates, (2) the second 12 months after the portfolios' formation dates, and (3) the third 12 months after the portfolios' formation dates.

As was mentioned in chapter four, measurement of sample portfolio return starts at least six months after the financial year-end. Accordingly, this study deals with three different starting dates for the samples' return calculations:

- ❖ Returns of companies that are included in sample (A) are observed over 23 test periods [*each test period extends up to 36 months*] as from October for each of the years 1979 to 2001. Note: these companies have financial year-ends within the first quarter of the year that ends March of each year of the years included in the study period.
- ❖ Returns of companies that are included in sample (B) are observed over 23 test periods [*each test period extends up to 36 months*] as from July for each of the years 1980 to 2002. Note: these companies have financial year-ends within the fourth quarter of the year that ends December of each year of the years included in the study period.
- ❖ Returns of companies that are included in sample (C) are observed over 23 test periods [*each test period extends up to 36 months*] as from January for each of the years 1980 to 2002. Note: these companies have financial year-ends within the first half of the year that ends June of each year of the years included in the study period.
- ❖ Returns of companies that are included in sample (D) are observed over 23 test

periods [*each test period extends up to 36 months*] as from July for each of the years 1980 to 2002. Note: these companies have financial year-ends within the second half of the year that ends December of each year of the years included in the study period. And so, shares in samples (B) & (D) have the same return measuring staring dates.

For both the benchmark and the beta risk adjusting approaches, samples' estimated abnormal returns are presented averaged over 23 test periods as from the first test period: (([Oct 1, 1979 to Sep 30, 1982], [Jul 1, 1980 to Jun 30, 1983], [Jan 1, 1980 to Dec 31, 1982])), and ending by the last test period: (([Oct 1, 2001 to Sep 30, 2004], [Jul 1, 2002 to Jun 30, 2005], and [Jan 1, 2002 to Dec 31, 2004])), for each of the samples (A), (B & D), and (C), respectively.

As in Arnold and Baker (2007) and Barber and Lyon (1997), for each single period (month), returns are defined as the change in price plus dividends, allowing for stock splits and other capital changes, scaled by the beginning-of-period price.

Post-event shares with missing return data because of any type of death that leads to the loss of all share value are regarded as of no value in the test period delisting month[1]. By that Arnold and Baker (2007, p. 5) emphasise "*By including even those companies that delist during the test period, many of which show a –100% return, we avoid survivorship bias*".

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[1] Arnold and Baker (2007) and Arnold and Xiao (2007) reinvest any post liquidation proceeds in the remaining shares in portfolios. However, based on related analysis using Source File [D: Dividends (lspdD)_ Column 7/ LSPD (2005)], it has been found: (i) over the whole period covered by LSPD (2005), *1955-2005*, a total of 77 liquidated companies received liquidation distributions. (ii) In relation to our study, just 4 and 14 companies out of 1395 shares in the final sample and 4177 shares in market portfolios, respectively, had received *Liquidation Distribution* (Type of dividend code 10). Consequently, these distributions amount to a very small sum of money and, if included, would have an insignificant impact on the results.

Such shares can have any of the following codes that are given by the LSPD file lspdG under "type of death" column G10:

- Liquidation (usually valueless). Code (7).
- Quotation cancelled for reason unknown, and no dealings under rule 163(2) or (3). Code (14).
- Receiver appointed/liquidation. Probably valueless. Code (16).
- Unitisation of an investment or financial trust. Code (17).
- Enfranchisement. Code (19).
- In administration/administrative receivership. Code (20).
- Cancelled and assumed valueless. Code (21).

On the other hand, post-event sample shares with missing return data because of events of acquisition, going private, takeover, merger, voluntary liquidation that affects the continuity of a previously listed company and includes net positive proceeds are dealt with by considering the last share closing price (value) just before delisting as the amount received and therefore is reinvested in the remaining shares in the sample portfolios -(i.e., the remaining investments in the portfolio are scaled up)- on an equally/value-weighted basis when portfolios' returns are calculated on an equally/value basis, respectively.

A similar treatment is made for the amounts received from the following deletions –[as given by LSPD under "type of death" column G10]- :

- Acquisition/takeover/merger. Code (5).
- Suspension/cancellation with shares acquired later. Meanwhile, may be traded under rule 163(2). Code (6).
- Quotation cancelled as a company becomes a private company, or these is insufficient trading in the shares. Dealings continue under rule 163(2) or (3). Code (8).

- As for Code (8), but no dealings under rule 163. Code (9).
- Quotation suspended. Code (10).
- Voluntary liquidation. Code (11).
- Change to foreign registration. Code (12).
- Quotation cancelled for reason unknown. Dealings continue under rule 163(2) or (3). Code (13).
- Converted into an alternative security for the same company. Code (15).
- Nationalisation. Code (18).

B*uy-and-hold* returns rather than the *cumulated* returns are estimated for the sample and benchmark portfolios. This superiority of the buy-and-hold approach over the cumulative abnormal returns approach is supported by the findings of Blume and Stambaugh (1983), Barber and Lyon (1997), Loughran and Ritter (1996), and Conrad and Kaul (1993). [Buy-and-hold returns as opposed to the cumulated abnormal returns is discussed in section (5.6) of this chapter].

To avoid incurring high transaction costs, we do not satisfy the theoretical condition implicitly required by the equally-weighted benchmark method, regarding incurring periodic share-rebalancing to sustain equal weights for shares in a portfolio over the long-run, (i.e., we do not buy/sell those shares that underperform/outperform the market).

At each of the 92 sample formation dates we have in this study, a similar technique to that of Liu et al (2003) is used. They create ten deciles based on the magnitude of earnings surprises (standardized unpredicted earnings) to investigate the post-earnings announcement drift in the UK.

According to this approach firms (shares) at each formation date will be separately ranked relative to their abnormal accruals from the lowest to the highest. Shares' estimates of any abnormal accruals are obtained by employing the time-series (MJM) regressions as was described in chapter four.

Firms are then allocated to ten abnormal accruals portfolios (ten deciles). Abnormal accruals decile number one consists of the lowest 10 per cent of firms in terms of their abnormal accruals, and so on till abnormal accruals decile number ten which consists of the highest 10 per cent of firms in terms of their estimated abnormal accruals.

In summary, this study deals with 920 sample portfolios (deciles) tested over 92 formation periods.

5.3 Defining the Buy-and-Hold Abnormal Returns (BHARs) Equation, and the Equal and Value-weighted Methods Used to Calculate the Portfolios' Buy-and-Hold Raw Returns

Empirically the (BHARs) for security *i* can be defined as:

$$\mathbf{BHAR}_{i\tau} = \prod_{t=0}^{\tau} [1+ R_{it}] - \prod_{t=0}^{\tau} [1+ E(R_{it})] \qquad (17)$$

Where:

R_{it} = is the month *t* simple return on a sample firm *i*.

τ : is the number of months in the test period.

Share returns are obtained from the return file (lspdRts) in LSPD. Share returns in that file are presented in the form log-return (^{L}R) according to the following equation:

$$^{L}\mathbf{R}_{it} = \ln((p_{it} + d_{it}) / p_{it-1}) \qquad (18)$$

Where:

$^{L}R_{it}$: is the log-return in $month_t$ for stock i.

p_{it}: is price in month t for stock i.

d_{it}: is the dividend going ex dividend during month t for stock i.

p_{it-1}: is price in month t-1 for stock i.

Returns as presented by LSPD are monthly *continuously* compounded returns. These returns are used directly as presented (i.e., in the log_return-form) by some researchers, e.g., Beenstock and Chan (1986), Levis (1985, 1989), and Poon and Taylor (1991). However, Strong and Xu (1997) stress that; theoretically the *discretely* monthly returns were found more relevant in the US-asset pricing studies. In the UK context, Liu et al. (1999), and Shi (2005) use a discretely compounded return. The percentage compounded monthly stock return is also used in earnings management studies, e.g., Ashbaugh et. al. (2003), Frankel et. al. (2002), Moreover, more recent US studies in the earnings management area use returns directly as they are provided by the CRSP[2], e.g., Marquardt and Wiedman (2004), Pae (2005), Ball and Shivakumar (2006), and McVay (2006).

Accordingly, Log-returns are converted into returns in the normal percentage form (i.e., the discretely compounded returns_ R_{it}) by applying the following mathematical formula to the log-returns:

$$\mathbf{Exp\ ({}^{L}R_{it}) = R_{it} + 1} \quad (19)$$

Where:

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[2] Based on the definition provided by "Baker Library_Harvard Business School" on their website for stock return and method of return compounding adopted by CRSP. Stock returns (r_t) are presented using the percentage form, and compounded (accumulated) over n periods using the following formula:

$$r_{t,t+n} = \prod_{i=0}^{n}(1 + r_{t+i}) - 1$$

Exp: the Exponential (EXP) is the inverse of LN, the natural logarithm of number. Returns e raised to the power of number. The constant e equals 2.71828182845904, the base of the natural logarithm.

R_{it}: is the month$_t$ simple return in the percentage form as intended to be used in E.q.(17).

Note that: $R_{it} = (p_{it} + d_{it} - p_{it-1}) / p_{it-1}$

E(R_{it}) = is the month t expected simple return for the sample firm i. It is worth pointing out that the value $E(R_{it})$ in this study can be equal to any of:

- The market raw returns (R_{mt}) when samples' raw returns are adjusted using the benchmark approach in the case of the market index.
- The size-control raw returns when samples' raw returns are adjusted using the benchmark approach in the case of the size match control portfolio.
- The book-to-market-control raw returns when samples' raw returns are adjusted using the benchmark approach in the case of the book-to-market match control portfolio.
- The size-and-book-to-market-control raw returns when samples' raw returns are adjusted using the benchmark approach in the case of the size-and-book-to-market match control portfolio.

T = number of test periods

When portfolio returns are calculated using the equally-weighted method we only need the share return data that is obtained directly from LSPD. Shares' return data are converted from the monthly log-form to their monthly simple percentage return-form (R_i) using the formula (19).

Shares that cease to continue while considered valueless such as liquidation [reason of death code (7)] are assigned a return of -1 (i.e., -100%) in the month of their death.

Meanwhile, shares that cease to continue but have value such as following merger [reason of death code (5)] are assigned a return of zero in the month of their death. (In the months leading up to merger they would have contributed significantly to the overall portfolio returns).

During any of the 36 monthly test periods we have, the portfolio's equally-weighted monthly raw returns in its simple percentage form is equal to the arithmetic mean (average) of all the shares' returns outstanding in the month.

Under the value-weighted method for calculating portfolio returns, the situation is much more complicated.

Besides converting share returns from the log-form to their simple percentages form, three considerations add to the complexity of the process, these are:

A- The use of the shares' market capitalisations. Regarding that aspect we do not use shares' market capitalisations directly as they are presented by LSPD for whole test periods (i.e., 36 months). Market capitalisation provided by LSPD are used only for the initial amount of investment as at the beginning of the first month of each test period. A share's market capitalisations as at the beginning of each of the rest 35 months included in any of the test periods are then created based on the share's corresponding monthly rates of return. By this procedure we avoid the effect of transactions such as equity issues, mergers, acquisition, etc., on firm's values that are considered by LSPD while they should not according to our analysis.

B- Reinvesting market capitalisations of delisted companies because of reasons associated with value such as equity issues, mergers. According to the value-weighted method for reinvesting, the last market capitalisation of a share that ceased to be quoted in a specific month within a specific test period is reinvested on value weighted basis among the remaining shares. A share's weight of the remaining companies is equal to the company's market value divided by total market values of remaining companies all as at the beginning of the following month for the delisting. Once each remaining company's interest of the newly received reinvestments has been identified, as from the first month following the death event month, remaining companies' market capitalisations are scaled up after reflecting the effect of their specific raw returns on any newly received amounts during that month and over time as long as they exist[3+4].

C- After the reinvestment process has been finished we calculate the portfolios' monthly value-weighted test period raw returns based on the shares' monthly new market capitalisations. That is, within the one test period a share's market capitalisation as at the beginning of a specific month is used just once to reflect that share's proportion of the overall portfolio's market capitalisation. For example, we use the shares' market capitalisations as at the beginning of the first months to weight shares' returns for the first month within the test period, and so on, till we use the shares' market capitalisations as at the beginning of the last month within the same test period, to weight shares' returns for the month 36.

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[3] Regarding the portfolios' event period reinvesting process, it is worth stressing that reinvesting of dead companies proceeds has been applied to all of our portfolios including the market indices as long as the value-weighted method for calculating returns are used.

[4] Note that, deleted companies for reasons described as valueless by LSPD can not be reinvested and therefore are not. Such companies lose all their market values in the month of delisting.

Delisted individual shares under the value-weighted method are dealt with in the same manner to that under the equally-weighted method regarding assigning a return of -1 (i.e., -100%) to them in the month of delisting if they are to be considered valueless due to, say, liquidation [reason of death code (7)].

During any of the 36 monthly test periods for any of the 92 formation dates, a portfolio's value-weighted monthly raw returns in its simple percentage form is equal to the arithmetic sum of all the shares' weighted returns outstanding in the month.

Finally, the two-sided t-statistic is employed to test the statistical significance of mean abnormal returns over the samples' periods being equal to zero across different abnormal accruals deciles. The t-statistic (t) used is as:

$$t = \frac{A.R_p}{S_{A.R.P} / \sqrt{N}}$$

Where: $A.R_p$: is the mean abnormal return of the portfolio being tested 'p'.

$S_{A.R.P}$: is the standard deviation of portfolio's p estimated abnormal return over 'N' number of test periods.

Moreover, we apply a nonparametric Wilcoxon Signed Ranks Test for further evidence of the significance of the estimated abnormal returns. The Wilcoxon test accounts for the equality between medians of portfolios' estimated abnormal returns. This test has the advantage over the parametric t-test. It does not make the normality assumption (i.e., the normality assumption means that the population distribution is normal, the case in which a population's median and mean values are equal).

5.4 Approaches for Estimation of Abnormal Returns

Three main approaches for estimating buy-and-hold abnormal returns for the sample portfolios are used in this study. In the first approach benchmark buy-and hold raw returns are estimated to adjust sample deciles' buy-and-hold raw returns. In the second approach sample deciles' buy-and-hold abnormal returns are estimated after adjusting for beta risk through the Capital Asset Pricing Model CAPM. And in the third approach the Fama and French's three factor model FF is employed.

A separate discussion for each main approach follows.

5.4.1 The Benchmark Approach for Estimating Abnormal Returns

Two kinds of benchmarks are used. In the first, 92 market portfolios are created. Buy-and-hold raw returns for those 92 market indices are used to adjust the 920 sample deciles' buy-and-hold raw returns.

In the second, buy-and-hold raw returns for a similar 920 'size', 920 'book-to-market ratio', 920 'size-and-book-to-market ratio' control portfolios are used to adjust sample deciles' buy-and-hold raw returns.

Barber and Lyon (1997) refer to these two methods as the reference portfolio approach (when the market index is used to adjust for any abnormal returns), and the control firms approach (when a similar 'size', 'book-to-market ratio', or 'size-and-book-to-market' returns are used), respectively.

For both approaches, raw returns within sample portfolios are calculated using an equally/value-weighted basis when the benchmark returns are calculated using the equally/value-weighted basis, respectively. Fama (1998) considers that the value weighting improves the ability to predict stock returns. Arnold and Baker (2007) observe that by moving from equal to value weighting, the influence of the small firm effect is reduced.

We now consider specifications of each approach:

5.4.1.1 The Estimation of the Benchmark Returns Using a Reference Approach Returns, 'the Market Index Returns'

According to this approach, at the beginning of [(Oct. each year 1979 to 2001-for Sample(A)) / (Jul. each year 1980 to 2002-for Sample(B)) / (Jan. each year 1980 to 2002-for Sample(C)) / (Jul. each year 1980 to 2002-for Sample(D))] sample deciles' average market-adjusted buy-and-hold test period returns are estimated for periods of: (1) the first 12, (2) the second 12, (3) the third 12, (4) the first 24, and (5) the whole test period of 36 months.

For both methods used to calculate returns, we present each decile market adjusted buy-and-hold returns, averaged over 23 test periods, for each of the samples (A, B, C, and D).

Results are also summarised for: (i) both samples (A&B) together. These two samples are the main samples in this study. They are combined together on the basis of their annually market adjusted returns; that is, the deciles' annual market adjusted buy-and-hold returns are averaged over 46 test periods. (ii) In the same way we combine the annually abnormal returns observations (i.e. 23 for each sample) of samples (C&D) together. By considering these two samples together we include all the companies in main sample as if we were testing one sample instead of four.

5.4.1.2 The Estimation of the Benchmark Returns Using the 'Match-Control' Portfolio Returns Approach

5.4.1.2.1 The Estimation of the Benchmark Returns Using the 'Size-Control' Portfolio Approach

It is argued in the existing literature (see section 2.3.1) that small firms appear to be riskier, or at least require higher returns, than large firms.

Chopra et al. (1992) argue that concerning stock performance, the debate revolves around how much of the differences in returns (e.g. among different abnormal accruals deciles) is attributable to equilibrium compensation for risk differences, and how much is an abnormal return.

We control for size to overcome problems argued to be associated with well-known asset pricing models; such that of the CAPM regarding omitting some "risk" factors -(most importantly: size and book-to-market ratio)- that if to be included in the model stock returns may be estimated more accurately. In the same context, Daniel and Titman (1997, p. 30) point out that comparing the evaluated returns with matched portfolios created on basis of their characteristics such as capitalisation, book-to-market, and probably also past returns is better than using asset pricing models such as the CAPM and the Fama and French's (1993) three factor model (FF) [5]. Moreover, Cheng and Leung (2006) stress that they use the control firm approach to avoid the return estimation bias resulting from observation clustering.

To estimate a size control return, we follow a procedure similar to that of Chopra et al. (1992), and suggested by Barber and Lyon (1997). This approach is employed by many researchers, e.g., Lakonishok et. al. (1994), Sloan (1996), Cheng and Thomas (2006), Myers et. al. (2007), Barton and Simko (2002), and Cheng and Leung (2006).

This approach, in addition to creating ten abnormal accruals deciles, requires the creation of ten size control deciles. For each of the 92 test periods, starting from Sep. 30, each year 1979 to 2001-for Sample (A), Jun. 30, each year 1980 to 2002-for Sample (B), Dec. 31, each year 1979 to 2001-for Sample (C), Jun. 30, each year 1980 to 2002-for Sample (D) market shares are separately ranked according to their sizes from the lowest to the highest. A firm size is

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[5] The FF model will be introduced in section (5.4.3) of this chapter.

measured by the market value of its common equity as of at the date of portfolio formation. Then firms (shares) are allocated to ten market-size portfolios (ten deciles). Market-size decile number one consists of the smallest 10 per cent of firms, and so on till size decile number ten which consists of the largest 10 per cent of firms.

For each of the ten abnormal accruals decile portfolios, we create a sample-size control portfolio. This sample-size control portfolio is constructed to have the same size composition as its corresponding abnormal accruals decile.

Empirically, we achieve this by computing averages of the monthly raw returns for each market size-decile portfolio. For each share in the abnormal accruals deciles, the corresponding market-size-decile's average return is observed. We then recalculate the abnormal accruals deciles' buy-and-hold returns, after substituting the original monthly sample shares' raw returns by their corresponding market-size decile monthly averages. (We substitute returns on the sample share level, that is; we consider for each share how many months a share originally was tested. Accordingly, each firm in any of the control portfolios will have the same number of return observations as its corresponding abnormal accrual portfolio).

The method for calculating the size-control portfolios' buy-and-hold returns is identical to that of the original sample (abnormal accruals portfolios) in every aspect including the reinvesting of delisted companies in cases such as mergers when returns are calculated using value-weighted method.

Post-formation sample adjusted returns are reported in two ways. We use the equally/value-weighted sample-size control returns, when shares within the abnormal accruals decile portfolios are equally/value-weighted, respectively.

When we use the value weighting approach to calculate the monthly "sample-size control returns" / "abnormal accruals deciles' returns", each share during the test period is given a weight as a proportion of the total market capitalisation of all the firms in the "sample-size control portfolios" / "abnormal accruals deciles", respectively, as at the beginning of each of the 36 months in the test period.

For both methods used to calculate returns (i.e., the equally and value-weighted methods), we present each sample decile's "size-adjusted" buy-and-hold returns, averaged over 23 test periods, for each of the samples (A, B, C, and D).

Results are also summarised for: (i) both samples (A&B) together, and (ii) samples (C&D) together.

5.4.1.2.2 The Estimation of the Benchmark Returns Using the Book-to-Market Control Portfolio Approach

In section 2.3.2 of chapter two we showed that high book-to-market equity shares are documented to earn higher adjusted returns than those of the low book-to-market ratio shares. This value-glamour phenomenon, as believed by many researchers (e.g., Fama and French (1992 and 1993)), is the result of high book-to-market equity shares being more risky because of a high proportion of financially distressed firms.

To control for any book-to-market systematic relationships with sample deciles' abnormal returns, we adjust the sample portfolios' raw buy-and-hold returns by samples'-"book-to-market" raw returns.

To estimate the book-to-market control returns, we follow a procedure similar to that of estimating the size control returns.

This approach in addition to creating ten sample abnormal accruals deciles requires the creation of ten sample-"book-to-market" control deciles. For each of the 92 test periods, [starting Sep. 30, each year 1979 to 2001-for sample(A), Jun. 30, each year 1980 to 2002-for sample(B), Dec. 31, each year 1979 to 2001-for sample(C), and Jun. 30, each year 1980 to 2002-for sample(D)] market shares will be separately ranked according to their book-to-market ratios from the highest to the lowest. A share's book-to-market ratio is equal to its book value divided by its market value. A firm size is measured by market value of common equity (i.e., outstanding common shares) as of at the date of portfolio formation. As in Houge and Loughran (2000), book value for a share is considered equal to its common stockholders equity[6].

Firms (shares) are allocated to 25 book-to-market portfolios[7]. Book-to-market portfolio number one consists of the highest 4 per cent of book-to-market firm, and so on till book-to-market portfolio number 25 which consists of the lowest 4 per cent of book-to-market firm.

For each of the ten abnormal accruals decile portfolios, we create a book-to-market control portfolio. This book-to-market control portfolio is constructed to have the same book-to-market composition as its corresponding abnormal accruals decile.

Empirically, we achieve this by computing averages of the monthly raw returns for each of the 25 book-to-market portfolios. For each share in the abnormal accruals deciles, the corresponding book-to-market portfolio monthly average raw return is observed. We then recalculate the abnormal accruals deciles' buy-and-hold average returns for each of the 920 samples (i.e., abnormal accruals) decile portfolios after replacing the original sample shares' returns by their corresponding book-to-market portfolio average returns. Returns are replaced on the sample share level as in the size-control portfolios.

The method for calculating the book-to-market-control portfolios' buy-and-hold returns is identical to that of the original sample (abnormal accruals portfolios) in every aspect

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[6] A share's common stockholders equity is equal to the share equity capital and its reserves. Code (305) in Datastream.

[7] We choose to create 25 market-"book-to-market" portfolios –(rather than 10 deciles as in the size control portfolios test)- as we believe this can lead to more sensitive tests. Note that the ratio here contains both of the book and market values.

including the reinvesting of delisted companies in cases such as mergers when returns are calculated using value-weighted method.

Post-formation sample adjusted returns are reported in two ways. We use the equally/value-weighted book-to-market control returns, when shares within the abnormal accruals decile portfolios are equally/value-weighted, respectively.

When we use the value-weighting approach to calculate the monthly book-to-market control returns and abnormal accruals deciles' returns, each share during the test period is given weight as a proportion of the total market capitalisation of all the firms in the book-to-market control portfolio and abnormal accruals deciles, respectively, as at the beginning of each of the 36 months in the test period.

For both methods used to calculate returns (i.e., the equally and value weighed methods), we present each sample-decile's "book-to-market"-adjusted buy-and-hold returns, averaged over 23 test periods, for each of the samples (A, B, C, and D).

Results are also averaged for: (i) both samples (A&B) together, and (ii) samples (C&D) together.

5.4.1.2.3 The Estimation of the Benchmark Returns Using the Size-and-Book-to-Market Control Portfolio Approach

Whatever the explanation/s, many studies document positive premiums associated with buying small firms and high book-to-market equity firms, and selling big firms and low-book-to-market equities.

The empirical test in this section was emphasised by Fama and French (1993). It aims to jointly control for both the size and book-to-market equity as explanatory variables in stock returns.

As in the size and book-to-market control approaches, the test here requires the creation of ten size-and-book-to-market control deciles, but differs in that it requires an additional two steps. As a first step, for each of the 92 test periods [starting from Sep. 30, each year 1979 to 2001-for sample (A), Jun. 30, each year 1980 to 2002-for sample (B), Dec. 31, each year 1979 to 2001-for sample (C), and Jun. 30, each year 1980 to 2002-for sample (D)] market shares are separately ranked according to their book-to-market ratios from the highest to the lowest. Then firms (shares) are allocated to five book-to-market quintile portfolios. Book-to-market portfolio number one consists of the highest 20 per cent of book-to-market ratio firms, and so on until book-to-market portfolio number five which consists of the lowest 20 per cent of book-to-market ratio firms.

In the second step, at each of the mentioned formation dates market shares are independently sorted on the basis of size from the smallest to the biggest. Then shares are allocated to five size quintile portfolios. Size portfolio number one consists of the smallest 20 per cent of shares. Size portfolio number five which consists of the largest 20 per cent of shares.

We obtain 25 size-and-book-to-market portfolios as a result of the intersection between the five size and five book-to-market group-quintiles. Size-and-book-to-market portfolio number one consists of the smallest (in terms of size) and highest (in terms of book-to-market ratio) firms. And so on, size-and-book-to-market portfolio number 25, which consists of the biggest (in terms of size) and lowest (in terms of book-to-market ratio) shares.

For each of the ten abnormal accruals decile portfolios, we create a size-and-book-to-market control portfolio. This size-and-book-to-market control portfolio is constructed to have the same size-and-book-to-market composition as its corresponding abnormal accruals decile. Empirically, we achieve this by computing averages of the monthly raw returns for each of the 25 size-and-book-to-market portfolios. For each share in the abnormal accruals deciles, the corresponding size-and-book-to-market portfolio monthly average raw return is observed.

We then recalculate the abnormal accruals deciles' buy-and-hold returns for the 920 sample (i.e., abnormal accruals) decile portfolios after replacing the original sample shares' returns by their corresponding size-and-book-to-market portfolio average returns. Returns are replaced at the sample share level as in both of the size and book-to-market control tests.

We use the value-weighted size-and-book-to-market control returns, when shares within the abnormal accruals decile portfolios are also value-weighted. According to this method, each share during the test period is given a weight as a proportion of the total market capitalisation of all the firms in the size-and-book-to-market control portfolio as at the beginning of each of the 36 months in the test period.

Any reinvestments in the size-and-book-to-market control portfolios are considered exactly as in the original sample portfolios.

We present each sample-decile's size-and-book-to-market-adjusted buy-and-hold returns, averaged over 23 test periods, for each of the samples (A, B, C, and D).

Results are also averaged for: (i) both samples (A&B) together, and (ii) samples (C&D) together.

5.4.2 The Estimation of the Sample Deciles' Abnormal Returns Using the CAPM, Betas and Standard Errors

Markowitz (1952) is one of the pioneers who introduced a model that combines risky assets (based on their return variances) into portfolios through quantifying the benefits of diversification, showing all the possible risk/return combinations resulting from mixing the total stock of shares in varying proportion. These possible combinations are called efficient portfolios and they all constitute the efficient frontier.

Sharpe (1964), Lintner (1965), and Black (1972) build on the foundation of Markowitz (1952) by introducing the risk-free asset to the analysis and therefore giving birth to the Capital Asset Pricing Model (CAPM). By incorporating the riskless asset into the analysis a more efficient frontier was created[8].

Under this approach to estimate the samples' abnormal returns, three distinct methods are used:

(1) Jensen alpha is estimated using the procedure first proposed by Ibbotson (1975). This procedure requires estimating the following time-series regression separately for each abnormal accruals decile:

$$\mathbf{R}_{pt} - \mathbf{R}_{rf} = \alpha_p + \beta_p (\mathbf{R}_{mt} - \mathbf{R}_{rf}) + \varepsilon_p \qquad (20)$$

Where:

R_{pt} = average sample portfolio (p) raw returns in month t.

R_{rf} = monthly riskless (risk-free) rate of return in month t[9].

R_{mt} = average market raw returns in month t.

α_p = Jensen alpha measure of abnormal returns, estimated on monthly basis.

β_p = the portfolio measure of beta risk, defined as:

$$\beta_p = Cov(R_p, R_m) / Var(R_m)$$

Where:

[8] The CAPM is based on a number of assumptions that are not likely to reflect a realistic financial environment and therefore can be taken as arguments against the model. These assumptions are, for example: investors are rational and risk-averse individuals, there are no taxes or transaction costs, and there is a risk-free asset.

[9] Based on LSPD (2005) file lspdlts, buy-and-hold risk-free interest rate is noted using the 90-day treasury rate which is annualised. To change these annualised rates into monthly rates we apply the following buy-and-hold conversion equation: Monthly rate= $(1+ \text{annual rate}/100)^{1/12} - 1$.

$Cov(R_p, R_m)$: is the covariance between the return on portfolio p and the return on the market portfolio m.

$Var(R_m)$: the variance of return on the market portfolio m.

ε_p = the portfolio (p) regression prediction error or 'stochastic' or 'random error'.

For each sample (A, B, C, and D) this regression is estimated at the sample-decile level, that is; based on all firm observations in the one decile category for the 23 test periods. 276 monthly observations -(12 month times 23 test periods)- are used in each sample-decile regression for each of the distinct periods: (1) the first 12 months, the (2) second 12 months, and the (3) third 12 months, all as from decile formation date. Of the 276 monthly observations, the first 12 observations come from the first formation date, and so on, till the last 12 observations that come from the last formation period[10].

(2) In the second method, the same regression Eq.(20) is employed with just one modification; instead of using the average market raw returns in month t (i.e., R_{mt}) we use the average size-control raw returns in month t. Then we follow an identical approach to that used to obtain Jensen Alpha.

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[10] Reported results for the distinct periods (i.e., the first 12, second 12, third 12 months as from portfolios' formation dates), respectively, are based on the monthly observations of the periods:

- Sample (A): (Oct. 1979 to Sep. 2002), (Oct. 1980 to Sep. 2003), and (Oct. 1981 to Sep. 2004).
- Samples (B & D): (Jul. 1980 to Jun. 2003), (Jul. 1981 to Jun. 2004), and (Jul. 1982 to June 2005).
- Sample (C): (Jan. 1980-Dec. 2002), (Jan. 1981-Dec. 2003), and (Jan. 1982-Dec. 2004).

(3) The third method still uses Eq.(20) but with another modification. Average market raw returns in month t (i.e., R_{mt}) are replaced by the average book-to-market control raw returns in month t. Then we follow an identical approach to that used to obtain Jensen Alpha.

Regarding the "CAPM" approach to estimate abnormal returns, three "*notes*" are important:

- ✓ For purposes of consistency with other performed tests, we report results of deciles' abnormal returns and betas in two ways. In the first/second: [R_{pt}] is measured as the monthly equally/value-weighted raw returns when [R_{mt}, or alternatively any of: the size control, or the book-to-market control] is measured as the monthly equally/ value-weighted raw returns, respectively.
- ✓ Specifications of notes in sections [(5.4.1.2.1) and (5.4.1.2.2)] of this chapter regarding the reinvesting of funds from delisted companies in remaining companies are considered for the CAPM tests to estimate all of: the monthly market average raw returns, the monthly size control average raw returns, and the monthly book-to-market average raw returns.
- ✓ Using the size control and book-to-market control monthly raw returns to adjust for abnormal returns creates more complications compared with the method used in Jensen Alpha. Whereas the same market index raw returns is used for each of the 10 sample deciles formed in any of the 23 test periods, there must be specific size control and specific book-to-market control raw returns for each specific sample decile in each specific test period.

And so, 60 regressions (10 sample deciles for each of the 23 test periods times 3 distinct periods of 12 months each times 2 methods used to weight returns) are estimated for each sample (A, B, C, and D), each of them contains 276 monthly observations.

We also test samples (A&B) together. Regressions here include 285 observations instead of 276 as in previous tests. The increase in number of observation is due to the differences in the dates we start measuring returns for different samples. Considering reporting results of the first distinct 12 months; of these 285 observations: the first 9 sample-decile (R_{pt}) observations [from Oct. 1979 to June 1980] come from sample (A) entirely; the next 267 observations [from Jul. 1980 to Sep. 2002] are averages for both samples (A&B). And the last 9 observations [from Oct. 2002 to June. 2003] come entirely from sample (B). We also, do the same for the sample- "market", "size control" and –"book-to-market control" returns when we combine these two data for the two samples.

On the other hand, when we test samples (C&D) together regressions include 282 observations. Considering reporting results of the first distinct 12 months; of these 282 observations: the first 6 sample-decile (R_{pt}) observations [from Jan. 1980 to June 1980] come from sample (C) entirely; the next 270 observations [from Jul. 1980 to Dec. 2002] are averages for both samples (C&D). And the last 6 observations [from Jan. 2003 to June. 2003] come entirely from sample (D). We also, do the same for the sample-"market", "size control" and "book-to-market control" returns when we combine these two data for the two samples[11].

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[11] For these two tests [i.e., samples (A&B) together and (C&D) together] the same procedures employed for the one sample tests are employed:

- Three different methods are used to adjust for any abnormal returns using the CAPM: (i) market portfolio returns, (ii) size control returns, and (iii) book-to-market control returns.
- The three "*notes*" mentioned in this section on page 181 regarding using the CAPM –(the case of one sample)- are also applied when combining samples (A&B) and (C&D) together.

Finally, for all the tests that estimate deciles' abnormal returns using the CAPM when the adjusting factor in the model is specifically the average market raw returns (i.e., through computing Jensen Alpha), we estimate the arbitrage portfolio.

Theoretically, the arbitrage portfolio can be achieved by taking a long position in the lowest abnormal accruals decile and going short in the highest abnormal accruals decile. If such an investment composition manages to sustain positive abnormal returns over time [more than what can be expected under the normal distribution, i.e., randomly] then an investment strategy can be constructed and the market can be said to be inefficient relative to the related set of data, which in our context, is the publicly available accounting information.

Before moving to the CAPM-arbitrage portfolio equation, we address a very important issue regarding the extent to which a strategy based on the arbitrage portfolio can be implemented in practice:

The whole idea of the arbitrage portfolio is based on selling shares now while you do not own them and simultaneously buying shares now while you do not pay for them until later. The final result of such a strategy can be segmented into two minor results:

The first stems from selling the shares that you do not own. Prices of these shares are expected to go down in future.

For example, an investor (A) borrows share (x) from investor (C) and sells it directly to investor (B) for £10. Investor (A) has to buy the same share after three months now to return it to (C). An advantage for investor (A) is gained if at the time he has to return share (x), i.e. after three months, the market value for share (x) was for example £9. At that time investor (A) will gain a net of £1 supposing there is no related financing costs to buying share (x) before giving it to investor (C).

The second minor advantage stems from buying long in the shares that are expected to go up in their values (at least relative to the shares that are shorted). And the situation is opposite to that of selling share (x) in the previous example. In fact, if for example, investor (A) takes such a position in share (y) with investor (D). Then investor (A) in that case is facing the same situation as of investor (B) in the proceeding example. The advantage for investor (A) can only happen if the price of share (y) goes up.

However, the question arises is to what extent it is true that investors can finance such transaction at the time they like and without any, or with very low, costs (in terms of any associated risks or capital outflows) to justify such a strategy?

Shleifer and Vishny (1997) answer this question. They argue that the way arbitrage is described in textbooks does not describe realistic arbitrage trades. They show that a realistic arbitrage trade: (a) needs capital, and (b) in most cases includes risk.

According to this study, stock exchanges require arbitragers to deposit some amount of capital against their trades. Such deposits are called *good faith money*[12].

Arbitrage trades can also be very risky. Shleifer and Vishny (1997) give an example of two similar bund futures contracts to deliver a specific amount in face value of German bonds at time *T*. They also suppose that the two contracts are being traded at time *t* in another two different exchanges at two different prices. An arbitrager in such a case will buy the cheaper contract and sell the other. If the price of the sold contract goes up –(and therefore prices of the two arbitraged contracts diverged)- at some point between time *t* and *T*, then the arbitrager is immediately required to pay the resulting difference in the price to his counterparty in the other market where the contract is intended to be sold. And so, for the arbitrager to make profit of the trade at time *T*, his pockets must be *deep* enough during the period *t* and *T* to withstand adverse movements.

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[12] The good faith money is approximately 3% of the original trade as appears from their explanatory example.

Moreover, the researchers point out that, in real arbitrage, different trading hours, settlement dates, and delivery terms impose more risk and complexity to the trade, e.g., they consider the situation where because of differences in trading hours an arbitrager may need to find money to buy the contract he is selling. In sum, according to Shleifer and Vishny (1997, p. 36) in reality there is risk arbitrageur where "*an arbitrager does not make money with a probability one, and may need substantial amounts of capital to both execute his trades and cover losses*".

Based on the CAPM model Eq.(20), the arbitrage portfolio is modelled as:

$$\mathbf{R}_{Lt} - \mathbf{R}_{Ht} = \alpha_{L\text{-}H} + \beta_{L\text{-}H} (\mathbf{R}_{mt} - \mathbf{R}_{ft}) + \mathbf{e}. \tag{21}$$

Where:

R_{Lt} = average raw returns in month t for the lowest abnormal accruals decile.

R_{Ht} = average raw returns in month t for the highest abnormal accruals decile.

$\alpha_{L\text{-}H}$ = the arbitrage portfolio Jensen alpha measure of abnormal returns, estimated on monthly basis.

$\beta_{L\text{-}H}$ = the arbitrage portfolio measure of risk Beta.

L = the lowest abnormal accruals decile.

H = the highest abnormal accruals decile.

The rest of the variables in Eq.(21) are defined as in Eq.(20).

Abnormal returns of the arbitrage portfolio are estimated for three distinct periods; the first 12, second 12, and third 12 months as from portfolios formation dates[13].

[13] We stress that all specifications of the original tests (i.e., using the CAPM) are considered for this test in a way that facilitates comparability between the lowest and highest deciles.

The CAPM has received considerable amount of criticism as not being able to explain the cross-section of average stock returns. Examples are:

Banz (1981), and Reinganum (1981) point out the evidence regarding the size effect can be directly taken against the CAPM. Reinganum (1981) adds that the persistence of the small firms' higher performance for periods extending to more than two years suggests that the market is inefficient in favour of the CAPM being misspecified.

Regarding the size effect, although Berk (1997) restricts his comparisons between the different portfolios to the portfolios' raw returns –[rather than using any of the other adjusting methods (e.g., the CAPM) to estimate abnormal returns]- if such a model like the CAPM was included, it would be considered as misspecified.

In UK research, Strong and Xu (1997) find evidence that over the period 1973-1992 when they include either market or any accounting based variables along with β, the latter becomes insignificant.

Kothari et al. (1995) conclude that stocks' cross-section average returns are proved to reflect substantial compensation for beta risk, provided that betas are measured at the annual –(rather than the monthly)- interval. They also they emphasise that beta alone is not sufficient to account for all the cross-sectional variation in expected returns, as implied by the CAPM.

Furthermore, Fama and French (1992, 1993) claim that for recent years, beta alone is not enough to explain the cross-section of average stock returns. They add; two simple firm characteristics (size and book-to-market equity) along with the market return can fully explain the cross-section variation of stock returns.

5.4.3 The Fama and French Three Factor Model (FF)

FF propose that the CAPM omits two important variables that if were included in the model, in addition to market returns, can explain the observed abnormal returns.

FF argue that while beta loads on the market premium to determine portfolios' expected returns, there are another two measures of sensitivity that load on portfolios returns reducing the margins for any abnormal returns. The first of these two sensitivity measures is described by them as the slope or loading on a size factor (a share's size or market value is equal to stock price times the number of shares outstanding), and the second is the slope or loading on book-to-market equity factor [a share's book-to-market equity is equal to the ratio of the book value of a firm's common stock to its market value. They also define a share's book value as the book value of stockholder's equity, plus balance sheet deferred taxes and investment tax credit (if available) minus the book value of preferred stock] [14].

FF claim that for US firms when monthly returns on stocks (calculated on value-weighted basis) are regressed on the three factors hypothesised as being able to explain the cross-section of stocks average returns the intercept in their regression that refers to the estimated abnormal performance will shrink to levels that are not statistically different than zero.

In order to perform their regression, FF in addition to observing the monthly market premium on the broad market portfolio of stocks as the first explanatory return variable for shares' expected returns, they also observe the monthly returns to mimicking portfolios for size- and book-to-market ratio as a second and third explanatory return variables in their regression.

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[14] For purposes of consistency with previous UK tests, we define the share's book value as in Miles and Timmermann (1996) where a share's book value is considered equal to its common stockholders equity. Accordingly, a share's book value is equal to the share equity capital and its reserves. Code (305) in Datastream. Also, in the UK context Strong and Xu (1997) points out that balance-sheet deferred taxes are not included in their study as a part of shares' book value. Moreover they refer to a study by Rajan and Zingales (1995) who suggest that the method of accounting for deferred taxes in the UK arguably makes them more debt-like. They also add that adjusting for these deferred taxes would not change the results qualitatively, (p. 21).

Empirically, they construct the size- and book-to-market portfolios as follows:

At the end of June each year t (1963-1993), New York Stock Exchange (NYSE), American Stock Exchange (AMEX) and Nasdaq stocks are allocated to two groups (small or big, S or B) based on whether their June market equity is below or above the median market equity for NYSE. NYSE, AMEX and Nasdaq stocks are allocated in an independent sort to three book-to-market equity groups (low, medium, or high; L, M, or H) based on the breakpoints for the bottom 30%, middle 40%, and top 30% of the values of book-to-market ratio for NYSE shares. Six size-and-book-to-market portfolios (S/L, S/M, S/H, B/L, B/M, B/H) are defined as the intersection of the two size and book-to-market groups. Value-weighted monthly returns on the portfolios are calculated from July to the following June. SMB is the difference, each month, between the average of the returns on the three small-stock portfolios and the average of returns on the three big portfolios. HML is the difference between the average of the returns on the two high book-to-market portfolios and the average of the returns on the two low book-to-market portfolios. FF do not use negative book-to-market equities in their analysis.

The three factor model (FF) requires estimating the following time-series regression separately for each abnormal accruals decile:

$$\mathbf{R}_{pt} - \mathbf{R}_{ft} = \alpha_p + \mathbf{b}_p\,(\mathbf{R}_{mt} - \mathbf{R}_{ft}) + \mathbf{s}_p(\mathbf{SMB}_t) + \mathbf{h}_p(\mathbf{HML}_t) + \mathbf{e}_p. \qquad (22)$$

Where:

R_{pt} : is the return on the decile portfolio p in month t.

R_{ft} : is the risk-free rate of return in month t.

α_p : is the estimated monthly abnormal return (performance) for portfolio p.

b_p : the systematic risk measure.

$R_{mt} - R_{ft}$: is the month t return premium on the market portfolio m.

SMB_t : is the month t difference between the return on a portfolio of small shares and the return on a portfolio of big market capitalization shares. FF define it as the month t return on the factor-mimicking portfolio for size factor.

HML_t : is the month t difference between the return on a portfolio of high-book-to-market shares and the return on a portfolio of low-book-to-market shares. It is defined by FF as the month t return on the factor-mimicking portfolio for book-to-market ratio.

The parameters -(i.e., factor sensitivities or factor loadings): b_p , s_p , and h_p are the slopes in the time series-regressions.

The FF regressions are estimated using the test period monthly value-weighted portfolio returns.

As a matter of fact, the Fama and French's three factor test we conduct is the same as that performed by FF apart from considering the book-to-market ratio breakpoints: 32% for the bottom, middle 36%, and top 32%, instead of 30%, 40% and 30%, respectively. We also differ from FF by tracing (calculating) all of the market, size, and book-to-market premiums over the whole 36 months included in each test period, while FF do that for just 12 months. Results are presented for three periods: the first, the second and the third 12 months as from the formation date. Monthly returns on sample, market, small, big, high and low book-to-market portfolios are calculated using value weighted method.

Based on the FF model Eq.(22), the arbitrage portfolio is modelled using the following time-series regression:

$$\mathbf{R}_{Lt} - \mathbf{R}_{Ht} = \alpha_{L\text{-}H} + \mathbf{b}_{L\text{-}H}(\mathbf{R}_{mt} - \mathbf{R}_{ft}) + \mathbf{s}_{L\text{-}H}(\mathbf{SMB}) + \mathbf{h}_{L\text{-}H}(\mathbf{HML}) + \mathbf{e}_p. \quad (23)$$

Where:

(L)/(H): refer to the lowest/highest abnormal accruals deciles, respectively.

The rest of the variables are defined as in equation (22).

5.5 A Further Look at Risk

For a better assessment of the relation between abnormal accruals and abnormal returns, we continue considering any possible systematic reason behind abnormal returns before we affirmatively recognise such a relation, and therefore, judge a market by describing it simply as inefficient.

Standard deviations, "deletions and liquidations" and "the year by year reliability" are of the concern in this section.

5.5.1 Deciles Standard Deviation

Deciles' standard deviations are computed for each sample-decile based on the raw return data for all the observations in the sample-decile [i.e., 276 observations for each decile in any of the samples (A, B, C, and D), 285 observations for samples (A&B) together, and 282 observations for samples (C&D) together].

5.5.2 The Deletions and Liquidations Test

Fama and French (1995) hypothesize that size and book-to-market equity ratios proxy for sensitivity to risk factors that strongly affect stock returns variations. Their evidence suggests that those variables are related to profitability (distress). They believe that a rational market should not/should be so influenced by short/long-term profitability variations, respectively. They stress that "*firms with high BE/ME (a low stock price relative to book value) tend to be persistently distressed. They have low ratios of earnings to book equity for at least 11 years* *around portfolio formation. Conversely, low BE/ME (a high stock price relative to book value) is associated with sustained strong profitability*", (p. 154).

In this section we try to show if there is any relation between abnormal accruals and percentages of firms' deletions and liquidations. If this is the case, then abnormal accruals at the date of portfolio formation can be said to proxy of firms' deletions and liquidations, an omitted variable from the analysis so far. And so, one can argue that any observed abnormal "accruals-returns" can be attributed to such omitted variables instead of/or in addition to abnormal accruals.

For each of the samples [A, B, C, D, (A&B) together, and (C&D) together] we explore three kinds of data for each abnormal accruals decile, over three years: the first, the second and the third year as from the portfolios formation dates. The three kinds of data are:

- ❖ Total number of all shares in the decile and their total market values as at the beginning of year in the test period.
- ❖ Total number of all shares that stopped being quoted during the year with reasons allowing for reinvesting their proceeds in remaining companies (main reasons are mergers and takeovers) in the decile, accompanied by their total market values.
- ❖ Total number of all shares that that have been liquidated during the year, accompanied with their total market values.

In a similar test to that in this study, Arnold and Baker (2007) evaluate how much risk-distress is related to different deciles created on the basis of their five-year rank period returns.

Regarding the deletion and liquidation tests, two notes are important:

- ✓ Data is presented based on equal-weights.
- ✓ Data for different deciles in different samples is accumulated over the 23 test periods.

5.5.3 The Year by Year Reliability test

In our final risk related analysis, we investigate the validity and reliability of our results. For all the tests performed by this study -(except for those related to the CAPM and FF)- we explore whether a trading strategy of buying long/short in shares with negative/positive abnormal accruals yields positive excess returns over a sustained period intervals of: the first 12, the second 12, the third 12, the first 24, and the whole test periods of 36 months, all as from portfolio formation date. We do this test by examining each portfolio formation individually rather than averaging over the 23 formations.

5.6 Why We Employ the Buy-and-Hold Abnormal Returns (BHARs) and not the Cumulated Abnormal Returns (CARs)?

In this section, we explore four of the important studies that have touched this area of research so far. These studies conclude that for long term study researchers should prefer using the BHARs approach rather than CARs.

Blume and Stambaugh (1983) attribute the documented 'size' related long-run abnormal returns primarily to a 'bid-ask' effect. They differentiate between two main stock prices: the true price (referring to that price at which a share can be both bought and sold) and the closing price (referring to the price at which the last transaction just prior the close of trading takes place). As a matter of fact, the last price will be higher/lower than the true price if at the time of the last transaction the situation prevailed is one of higher/lower demand than supply, respectively.

Accordingly, the bid-ask bias affects computing abnormal returns since we usually observe computed returns (i.e., those returns incorporating closing prices, and therefore, are distorted by the bid-ask effect), and not the true or actual returns (those incorporating true prices).

The researchers employ U.S data, over a period of 19 years starting from 1963 to 1980. They observe that significant/insignificant portion of the small/large stock returns, respectively, may reflect a positive (upward) bid-ask bias (p. 391). [Notice that a positive bid-ask bias, is equivalent to saying that the observed closing prices for small stocks are less than the true ones; and accordingly, those stocks can be described as low priced (i.e., undervalued)].
They also find that these abnormal returns for the small size portfolios are only observed under the arithmetic averaging strategy for measuring portfolio returns; a strategy that theoretically (i.e., not actually) considers sustaining equal weights to securities included in portfolios by implicitly carrying continuous rebalancing of those securities (the theoretical rebalance happens through buying/selling those securities which underperformed/outperformed the market, respectively). The bid-ask bias, under the absence of actual security rebalancing, leads to a significant overestimation of abnormal returns. Blume and Stambaugh add that under a strategy of buy-and-hold (where returns are compounded rather than arithmetically averaged), the induced closing prices bid-ask bias almost evaporates.

Barber and Lyon (1997) discriminate between: the cumulated abnormal returns (CARs) and the buy-and-hold abnormal returns (BHARs) approaches. They employ three/two different benchmark methods to estimate the expected return under the CARs/BHARs approaches, respectively. These benchmark methods are: (1) the reference portfolios [such as the equally-weighted market index], (2) the control firms or match firms [these include: size-match firms, book-to-market match firms, and size-and-book-to-market match firms], and finally, (3) the Fama-French three-factor model [applicable only for the CARs approach].

To distinguish between the CARs and BHARs, Barber and Lyon investigate the two approaches and their alternative benchmark methods on the basis of observing specifications and power of test-statistics, under the maintained hypothesis 'abnormal returns are zero'.

To assess how much a test-statistics for a specific approach and benchmark method is specified, the researchers study a randomly selected sample of 1000 portfolios. For such portfolios, a well-specified/misspecified test-statistics for a combination of abnormal return approach and its benchmark method (e.g. CARs and the equally-weighted market index) is one that produces type *I* error significantly equal or less/higher than the specified by researcher level of significance (α), respectively.

On the other hand, they evaluate the power of a test-statistics after artificially inducing abnormal returns to the same randomly selected 1000 portfolios by observing the frequency with which each combination of abnormal return approach and its benchmark method generate type *II* errors.

Needless to say that, a model with less type *I* and *II* errors is statistically preferred to another with higher frequencies.

The findings of their study are:

For both the BHARs as well as the CARs approaches, the test-statistics are misspecified [i.e., produces higher than accepted (expected) levels of type *I* errors] when employing the reference portfolios benchmark method, mainly if the benchmark portfolio returns are equally-weighted when calculated. This misspecification occurs as result of three biases when adopting the BHARs approach, these are: rebalancing, new listing, and skewness biases. On the other hand, it occurs because of: measurement, new listing, and skewness biases when employing the CARs approach. The rebalancing bias (motivated by the compounding BHARs approach) results from the theoretical but not actual buying/selling of losers/winners at the end of each period, respectively. The researchers stress "*the rebalancing will lead to a bias in the population mean for buy-and-hold abnormal returns if the consecutive monthly returns for individual securities are correlated. As it turns out, this monthly rebalancing leads to an inflated return on the market index and a negative bias in buy-and-hold abnormal returns*" (p. 348). The new listing bias, is induced by new companies listing their stocks after the date for the sample firms under investigation (i.e., after the event period has started). This happens if those firms' average return is different (higher or lower) than that of the benchmark before their listing. Referring to Ritter (1991, p. 3) who argues that "*the underpricing of IPOs that has been widely documented appears to be a short-run phenomenon*", the researchers propose that companies that go public underperform the market index benchmark, leading to positive bias. In regarding the skewness bias, it is found that the long-run buy-and-hold abnormal returns using the reference portfolios benchmark method is positively skewed with negative mean. A positively skewed BHARs distribution is one that has median value less than the mean value. According to them, this happens since it is always possible to observe very high/moderate average returns for individual stocks/market, respectively.

Concerning the measurement bias, it is found that CARs are found to be higher than those of BHARs when the latter is less than or equal to zero. Opposite findings are observed when BHARs are remarkably higher than zero. And in general, it was identified that CARs represent a biased predictor of BHARs when regressing CARs on BHARs for randomly selected portfolios, (p. 346).

In their study, they also find that the CARs are positively biased, on the long-run, mainly because of the new listing bias. (p. 361).

Regarding this bias, which will lead the CARs to represent a biased estimate of the BHARs, in addition to the latter's ability to produce an economically understood measures of performance for different financial investments, Barber and Lyon prefer the use of the

BHARs approach to the CARs.

Similar results are found by Conrad and Kaul (1993). These researchers note that abnormal returns that are calculated using the CARs approach are spuriously inflated/deflated for losers/winners in the typical long-term contrarian strategy, respectively. As Blume and Stambaugh (1983), and Barber and Lyon (1997), Conrad and Kaul consider the effect of the bid-ask bias on the observed stock prices and returns. As a result, they believe that the long-run past period losers/winners are low-/highly-priced relative to the market, respectively. They also stress that cumulating short-term single period (e.g., the monthly basis) returns over long periods "*cumulate not only the 'true' short-term returns but also the upward bias in each of the single period returns*" (p. 40).Under the hypothesized condition of rebalancing stocks in portfolios which is implicitly required by the CARs (and does not actually take place), the observed low/highly priced loser/winner stocks will incur spuriously upward/downward event time abnormal returns, respectively. On the other hand, they stress that while the BHARs approach has the advantage of minimizing transaction costs since it does not imply rebalancing stocks inside portfolios compared by the CARs approach, it also has another advantage regarding handling the bias that may result from the bid-ask spread as constant regardless the length of the measurement interval, (since this approach compounds returns rather than cumulates them).

Loughran and Ritter (1996), comment on Conrad and Kaul (1993) finding regarding the problems associated with using the CARs if the observed (computed) returns are not equal to the true ones as a result of say the bid-ask bias, they clarify: "*we do not have any disagreements with this important part of their study*" (p. 1959).

5.7 The Concept of Heteroscedasticity

Heteroscedasticity is a term opposite to homoscedasticity. Homoscedasticity is the case when the observations in the population under investigation have constant or equal variances, the factor that leads when carrying out the regression through using the Classical Linear Regression Model (CLRM), the Ordinary Least Squares (OLS) estimators to be unbiased linear estimators with minimum variance, they are then (BLUE), Best Linear Unbiased Estimators,) Gujarati (1992).

Heteroscedasticity is when the population's observations variances have systematic relation with one or more specific variables, (this may include input variable(s) and as a consequence the output variable).

Because of heteroscedasticity a situation of biased variances appears to occur regarding both the dependent variable and the related explanatory variable(s), (i.e., the coefficients for these variables can be overestimated as well as underestimated). And this will affect the accuracy of any hypothesis tests like those based on (*t*) and/or (*F*) distributions. "*In short, in the presence of heteroscedasticity, the used hypothesis-testing routine is not reliable, raising the possibility of drawing misleading conclusions.*" Gujarati (1992, p. 325).

Heteroscedasticity is more common in cross-sectional data than in time-series data. Studies that investigate variable(s) like income, prices, interest rates and the alike, especially when they are tested as being allocated to different firm-size categories, are expected (the variables in that study) to follow with the error term a heteroscedastic pattern, and that is because different levels of these variables in such a research are believed to contain different levels of discretionary errors in a systematic manner.

In our study for example, different levels of total assets are expected to have systematically different levels of total accruals [levels of total accruals are represented in both equations: Eq.(1), and Eq.$^{/}$(15)]. If this is the actual prevailing relation between total accruals and total assets, and it is believed to be, then different levels of total assets are expected to have systematically different levels of the accruals prediction errors [i.e, Eq.(16)].

One of the methods for handling the phenomena and therefore ease its possible negative effects on (OLS) estimators, is to regress the squared residuals (e_i^2) that resulted from a certain regression on the variables included in that regression; variable by variable, till one can notice the variable with the most significant relation with (e_i^2). Then, after tracing the nature of that relation, the researcher can deflate the whole equation by a specific form of that variable before carrying out the (OLS) regression. This method gives weights to the estimated individual e_i^2 to minimize the variance of the equation as a whole, as well as the variance(s) of the related variable(s), which adds directly and significantly to the credibility of inferences made about the population behaviour.

5.8 Summary

This chapter considers two main methodology approaches for estimating abnormal returns along with risk analysis for decile portfolios formed on the basis of abnormal accruals, namely, the benchmark approach for estimating abnormal returns, and the regression approach on the potential explanatory factors.

Under the benchmark approach, two methods are employed, specifically, the reference benchmark approach through using returns on the market-index, and the matching approach implying using returns on any of size control, book-to-market control, or size-and-book-to-market control portfolios.

Similarly, two types of regression are estimated under the regression approach; the first is the CAPM and the second is the FF three factor model.

CHAPTER SIX

RESULTS: THE PROFITABILITY AND CONSISTENCY OF THE ABNORMAL ACCRUALS ANOMALY

6.1 Introduction

As was discussed in the literature review chapter, since Sloan's (1996) work, many empirical studies have been conducted to assess the role of accounting accruals in stock prices. Moreover, recent research has split total accruals into its two main parts: the normal and abnormal accruals and documented market failure to adjust efficiently to information contained in abnormal accruals, e.g., Xie (2001).

In the UK, surprisingly we could not find any published work investigating how the LSE capitalises information in abnormal accruals.

The aim of this chapter and the subsequent one is to assess the hypotheses of this study mentioned in chapter four: (1) whether LSE shares with the *highest 10%* of abnormal accruals experience on average abnormal returns less than zero. (2) Whether LSE shares with the *lowest 10%* of abnormal accruals experience on average abnormal returns higher than zero, and finally, (3) whether the arbitrage portfolio defined as buying *long/going short* in shares with the *lowest /highest* 10% of abnormal accruals is profitable.

In this chapter sample abnormal accruals deciles' returns are adjusted using four main methods. These methods include (1) using returns on the market-indices, (2) using returns on "size" control portfolios, (3) using returns on "book-to-market" control portfolios and (4) using returns on "size-and-book-to-market" control portfolios.

The consistency of the abnormal accruals anomaly is also investigated in a separate analysis which shows the number of positive abnormal returns obtained by the different abnormal accruals deciles. Moreover, abnormal returns for the lowest, highest and the hedge portfolio (the lowest minus the highest abnormal accruals deciles) are plotted for each of the 23 portfolio formations for all samples (A, B, C, and D) and their combinations (A+B) and (C+D).

In the next chapter, a further risk analysis is conducted considering another two important methods to estimate the sample deciles' abnormal performance. The first method uses the CAPM, and the second employs the FF three factor model.

The reminder of this chapter is organised as follows. Section 6.2 includes descriptive analysis for the MJM estimated regressions. Section 6.3 evaluates the profitability of the abnormal accruals. Section 6.4 conducts analysis of the consistency of the abnormal accruals anomaly. Finally, section 6.5 summarises the chapter.

6.2 Descriptive Analysis Concerning the "MJM" Regressions Estimated by this Study

The descriptive analysis that has been prepared in this section is essentially based on pooling all the companies in the one abnormal accruals decile level together over the 23 test periods for each of the samples (A B, C, and D), as if they were all within a single *pooled*-"abnormal accruals" decile that is tested just for one period. Then, statistics regarding the MJM are observed based on all company-years in the one abnormal accruals-pooled decile[1].

Two main issues are considered in this section: (i) average number of years included in the MJM regressions to estimate abnormal accruals, and (ii) number of times these regressions generate positive and negative abnormal accruals for each decile within each sample (A, B, C, and D).

6.2.1 Average Number of Observations Used in this Study to Estimate the Shares' Abnormal Accruals Using the MJM Regression

Table 4.5 in chapter four shows that 435, 599, 596, and 788 distinct companies were actually tested over 23 portfolio formations for the samples (A, B, C and D), respectively. In total 3330, 4578, 4492 and 6079 company formations were established. On average, a share is tested: 7.7, 7.6, 7.5, and 7.7 times, respectively. And therefore, the *average* number of observations included in the MJM regressions to estimate abnormal accruals is 16.7, 16.6,

[1] So, we distinguish between abnormal accruals deciles, and pooled-"abnormal accruals" deciles. Each pooled-"abnormal accruals" decile for any of the samples (A, B, C, and D), is formed based on combining data for 23 (equal to the number of test periods available for each sample over the study period) abnormal accruals deciles of the same level of abnormal accruals (e.g., the pooled-"abnormal accruals" decile number one for a specific sample contains data of the shares in all the deciles number one over the 23 test periods). By this procedure, 10 pooled-"abnormal accruals" deciles instead of 230 (single abnormal accruals decile) are tested for each sample.

16.5 and 16.7 observations, respectively[2].

Table 6.1 shows numbers of firms tested against different periods of years used to estimate the time-series MJM for the samples (A, B, C, and D). The lowest/highest number of years used in the MJM regressions is 10/32 years, respectively.

6.2.2 Number of Positive and Negative Abnormal Accruals Estimated by the MJM Regressions over the Study Period

Table 6.2 summarises: (i) total number of the estimated MJM regressions, and (ii) how many of the estimated abnormal accruals have a positive sign and (iii) how many are negative. Information is given for each of the 23 portfolio formations included in the samples (A, B, C, and D) as well as for all the samples together.

This table indicates higher numbers of negative abnormal accruals relative to those of the positive abnormal accruals. In percentages: 42.8%, 44%, 43%, and 44% of the 3330, 4578, 4492, 6079 abnormal accruals estimations for the samples (A, B, C, and D), respectively, were accompanied with positive sign.

The higher number of negative abnormal accruals cases may be explained by the possibility that in practice a positive abnormal accruals decision in one year needs more than one year to be offset through adopting offsetting negative abnormal accruals decisions.

[2] These can be obtained by dividing each sample's total number of company-years by its number of different companies plus 9. Adding 9 is due to: 9 = [10 (where 10 is the minimum number of year-intervals accepted by this study to run the MJM regressions) minus 1. Deduction of 1 is to allow for the base year; one is the maximum number of regressions that can be estimated from the 10 year-interval observations].

TABLE 6.1

NUMBER OF FIRMS TESTED IN EACH SAMPLE (A, B, C, and D), CLASSIFIED IN TERMS OF THE TIME-SERIES OBSERVATIONS (i.e. YEAR-INTERVALS) INCLUDED IN THE M.J.M REGRESSIONS.

(A SUMMARY FOR ALL SAMPLES HAS ALSO BEEN CONDUCTED)

NUMBER of	SAMPLE (A)			SAMPLE (B)			SAMPLE (C)			SAMPLE (D)			ALL SAMPLES		
YEARS[1]	N[2]	P[3]	C.P[4]	N	P	C.P	N	P	C.P	N	P	C.P	N	P	C.P
10-YEAR REG.	435	13%	13%	599	13%	13%	596	13%	13%	788	13%	13%	1384	13%	13%
11-YEAR REG.	398	12%	25%	546	12%	25%	546	12%	25%	717	12%	25%	1263	12%	25%
12-YEAR REG.	352	11%	36%	484	11%	36%	491	11%	36%	635	10%	35%	1126	11%	36%
13-YEAR REG.	286	9%	44%	417	9%	45%	401	9%	45%	554	9%	44%	955	9%	45%
14-YEAR REG.	247	7%	52%	348	8%	52%	338	8%	53%	464	8%	52%	802	8%	52%
15-YEAR REG.	219	7%	58%	318	7%	59%	296	7%	59%	416	7%	59%	712	7%	59%
16-YEAR REG.	194	6%	64%	278	6%	65%	252	6%	65%	364	6%	65%	616	6%	65%
17-YEAR REG.	172	5%	69%	238	5%	71%	216	5%	70%	313	5%	70%	529	5%	70%
18-YEAR REG.	154	5%	74%	211	5%	75%	194	4%	74%	276	5%	74%	470	4%	74%
19-YEAR REG.	139	4%	78%	184	4%	79%	181	4%	78%	242	4%	78%	423	4%	78%
20-YEAR REG.	124	4%	82%	167	4%	83%	165	4%	82%	224	4%	82%	389	4%	82%
21-YEAR REG.	99	3%	85%	119	3%	85%	134	3%	85%	165	3%	85%	299	3%	85%
22-YEAR REG.	90	3%	87%	107	2%	88%	124	3%	88%	151	2%	87%	275	3%	87%
23-YEAR REG.	84	3%	90%	101	2%	90%	113	3%	90%	140	2%	90%	253	2%	90%
24-YEAR REG.	75	2%	92%	92	2%	92%	99	2%	92%	129	2%	92%	228	2%	92%
25-YEAR REG.	70	2%	94%	83	2%	94%	90	2%	94%	116	2%	94%	206	2%	94%
26-YEAR REG.	53	2%	96%	73	2%	95%	71	2%	96%	104	2%	95%	175	2%	96%
27-YEAR REG.	41	1%	97%	65	1%	97%	59	1%	97%	94	2%	97%	153	1%	97%
28-YEAR REG.	40	1%	98%	55	1%	98%	52	1%	98%	77	1%	98%	129	1%	98%
29-YEAR REG.	25	1%	99%	37	1%	99%	33	1%	99%	49	1%	99%	82	1%	99%
30-YEAR REG.	19	1%	100%	27	1%	99%	23	1%	100%	34	1%	99%	57	1%	100%
31-YEAR REG.	10	0%	100%	18	0%	100%	13	0%	100%	21	0%	100%	34	0%	100%
32-YEAR REG.	4	0%	100%	11	0%	100%	5	0%	100%	13	0%	100%	18	0%	100%
TOTALS	3330			4578			4492			6086			10578		

Where:

1 : This column shows the number of year-intervals (observations) included in the M.J.M regressions. A 10 year-interval (i.e., 11 years) is the minimum period, and a 32 year-interval (i.e., 33 years) is the maximum period.

N[2] : This column shows number of tested firms against different periods.

P[3] : This column shows percentages of tested firms employing the different lengths of periods relative to total number of all the firms within the sample.

C.P[4] : This column shows the cumulative percentages of tested firms moving from the lowest number of years included in the regressions to the highest.

TABLE 6.2

TOTAL NUMBERS (T.N.) OF THE ESTIMATED M.J.M REGRESSIONS FOR EACH OF THE FOUR SAMPLES (A, B, C, AND D) OVER THE 23 TEST PERIODS. NUMBERS OF POSITIVE (P.(+)) AND NEGATIVE (N.(-)) ESTIMATED ABNORMAL ACCRUALS

	SAMPLE (A)			SAMPLE (B)			SAMPLE (C)			SAMPLE (D)			SAMPLES (C & D) [4]		
	T.N.	P.(+)	N.(-)	T.N.	P.(+)	N.(-)	T.N.	P.(+)	N.(-)	T.N.	P.(+)	N.(-)	T.N.	P.(+)	N.(-)
[1] 1	128	66	62	157	95	62	161	85	76	210	123	87	***371***	***208***	***163***
2	155	81	74	181	67	114	188	101	87	244	97	147	***432***	***198***	***234***
3	154	52	102	177	63	114	189	58	131	237	78	159	***426***	***136***	***290***
4	140	53	87	173	58	115	175	66	109	231	87	144	***406***	***153***	***253***
5	217	78	139	274	113	161	285	103	182	364	148	216	***649***	***251***	***398***
6	209	91	118	272	133	139	277	122	155	362	178	184	***639***	***300***	***339***
7	210	97	113	247	104	143	285	124	161	325	131	194	***610***	***255***	***355***
8	181	70	111	219	89	130	241	94	147	295	117	178	***536***	***211***	***325***
9	154	64	90	205	77	128	211	87	124	276	108	168	***487***	***195***	***292***
10	139	51	88	185	80	105	192	69	123	248	102	146	***440***	***171***	***269***
11	122	58	64	168	79	89	169	81	88	227	104	123	***396***	***185***	***211***
12	116	54	62	156	62	94	159	69	90	213	88	125	***372***	***157***	***215***
13	124	56	68	179	71	108	165	72	93	241	93	148	***406***	***165***	***241***
14	120	48	72	177	89	88	162	59	103	233	115	118	***395***	***174***	***221***
15	122	50	72	174	58	116	164	66	98	230	84	146	***394***	***150***	***244***
16	117	38	79	173	68	105	160	61	99	230	86	144	***390***	***147***	***243***
17	119	54	65	191	97	94	165	82	83	250	124	126	***415***	***206***	***209***
18	119	67	52	202	86	116	168	92	76	262	113	149	***430***	***205***	***225***
19	119	56	63	192	82	110	166	67	99	251	110	141	***417***	***177***	***240***
20	129	50	79	216	114	102	186	77	109	281	146	135	***467***	***223***	***244***
21	148	60	88	227	124	103	210	99	111	295	164	131	***505***	***263***	***242***
22	148	62	86	218	101	117	211	96	115	290	136	154	***501***	***232***	***269***
23	140	68	72	215	95	120	203	96	107	284	125	159	***487***	***221***	***266***
Total	**3330**	**1424**	**1906**	**4578**	**2005**	**2573**	**4492**	**1926**	**2566**	**6079**	**2657**	**3422**	**10571**	**4583**	**5988**
%	100%	[2] 42.8%	[3] 57.2%	100%	44%	56%	100%	43%	57%	100%	44%	56%	100%	43%	57%

Where:

1 : This column shows the samples' formation years. Year (1) is the first, and year (23) is the last formation period.

2 : This percentage is equal to the number of positive abnormal accruals to total number of abnormal accruals estimations

3 : This percentage is equal to the number of negative abnormal accruals to total number of abnormal accruals estimations

4 : Represents a summary for all the company-years included in the study without any duplication. This is facilitated by taking just samples (C) and (D). This summary shows the total number of the regressions estimated in this study. And how many of these were accompanied with positive and negative signs.

6.3 Performance of Sample Deciles Created on the Basis of Abnormal Accruals

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares which publish their accounting data during the first quarter, the fourth quarter, the first half, and the second half of the year, respectively. Then, a share's abnormal accruals are estimated using the MJM (1995) for the four samples, each for 23 test periods.

Each year, samples' shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accuals shares. Abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares.

Returns of the abnormal accuals deciles are estimated for 36 months starting 6 months after the end of the financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively.

In this chapter, four main methods are used for the purpose of assessing the performance of a sample portfolio. In the first, deciles' returns are adjusted using returns on broad market portfolios. In the second sample returns are adjusted using returns on matching portfolios created on the basis of size. In the third and fourth, deciles' returns are adjusted using returns on matching portfolios created on the basis of "book-to-market ratio" and "size-and-book-to-market ratio", respectively. The second, third and fourth methods aim to compensate for any size, book-to-market ratio, and size-and-book-to-market ratio return-premiums, respectively.

Sample deciles' adjusted returns are estimated twice; once using an equally-weighting basis and another using value-weighting. When returns of a sample abnormal accruals decile is estimated on an equally/value weighted basis, returns on the adjusting factor are estimated on an equally/value weighted basis, respectively.

The analysis has been simultaneously conducted for samples (A, B, C, and D) and their combination samples (A+B) and (C+D), although we may be particularly interested in the results of sample (C+D) as this sample has the merit of including all the sample shares (i.e., 1395 different shares) through combining two *semi*-annual samples[3+4].

Sample (A+B) is also of major importance as it combines the two main quarterly samples (i.e., A & B) in this work, besides it reasonably overcomes a possible limitation concerning interpreting results of individual samples based on low number of observations, mainly sample (A) that includes the lowest number of 435 different firms and 3330 firm-years over the 23 test periods.

Another important related issue is that although results are presented for ten abnormal accruals deciles in accordance with hypothesises of this study, we would prefer to think about deciles 1 and 2 together as the lowest abnormal accruals quintile and deciles 9 and 10 as the highest abnormal accruals quintile as this may resolve mistaken interpretations for results based on low number of observation within the deciles, mainly for sample (A).

Finally, samples' adjusted returns are presented averaged for all 23 portfolio formations. Results are presented for 5 distinct periods: the first 12-months, the second 12-months, the third 12-months, the first 24-months, and finally the whole 36 month-test period.

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[3] The reasons for creating four minor samples (A, B, C, and D) instead of testing one major sample were discussed in chapter four.

[4] Adjusted returns for the sample combinations (A+B), and (C+D) are obtained by averaging 46 annually adjusted returns for each of them. Note that 23 annually adjusted observations come from each individual sample.

6.3.1 Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Returns of a specific sample decile are adjusted by returns of a specific market portfolio. A market portfolio that has been constructed to adjust returns of a specific sample decile will include all the LSE shares existing as at the sample portfolio's formation date except those classified as banks, financial institutions, insurance companies etc. Therefore, 92 different market portfolios have been constructed to match the 92 different sample formation dates included in this study.

Sample market-adjusted returns are estimated in two ways. First, equally-weighted returns on market indices are used to adjust sample portfolios' equally-weighted returns. Second, value-weighted returns on market indices are used to adjust value-weighted sample portfolios' returns.

Deciles' numbers of positive market-adjusted returns are recorded on the right hand-side of both panels. The maximum possible occurrence of positive market-adjusted returns for all samples is 23, including (A+B), and (C+D) [5].

We start with the equally weighted market adjusted returns.

6.3.1.1 Equally-Weighted Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (A) of tables 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, and 6.3.6 show the equally-weighted market-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively.

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[5] Note that the sign of abnormal returns on any of the sample combinations (A+B) and (C+D) in a specific year is determined by the sign on average abnormal returns for both related samples computed as in the same year.

TABLE 6.3

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED FOR EACH SAMPLE AVERAGED FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, a share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively. Deciles' returns are adjusted using returns calculated on broad market portfolios. Returns of a specific sample decile are adjusted by returns of specific market portfolio to avoid *new listing bias. A market* portfolio that has been constructed to adjust returns of a specific sample decile will include all the LSE shares existing as at the sample decile formation date. And therefore, 92 different market portfolios have been constructed to match the 92 different sample formation dates included in this study. Sample market- adjusted returns are estimated in two ways. First, equally-weighted market indices are used to adjust equally-weighted sample deciles' returns. Second, value-weighted market indices are used to adjust value-weighted sample deciles' returns. All numbers presented are averages over the 23 test periods computed for corresponding sample portfolios. Tables 6.3.1, 6.3.2, 6.3.3, and 6.3.4 present the above samples' market-adjusted returns, respectively. Results of samples (A+B), and (C+D) are also presented on the basis of combining their annual market-adjusted returns in tables 6.3.5, and 6.3.6.

The tables are prepared as follows:

The number of positive market-adjusted returns is recorded on the right hand-side of both panels (A) and (B). The highest possible positive occurrence is 23, i.e., number of test periods. The last line of both panels (A) and (B), shows the difference in market-adjusted returns between decile number 1 (i.e., the lowest abnormal accruals decile) and decile number 10 (i.e., the highest abnormal accruals decile). *For both the equally- and value-weighted tests, the estimated market-adjusted returns are presented accompanied with t-statistic (t-) and the non-parametric Wilcoxon Signed-Rank Test (W.t-), where:*

- *Shows significant negative-adjusted returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red this shows significant negative-adjusted returns at 1% two-tailed (critical t- is -2.8).*
- *Shows significant positive-excess returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue this shows significant positive-excess returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 6.3.1

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.08	-2.19	0.04	-0.03	-0.67	0.19	-0.03	-0.95	0.60	-0.11	-1.88	0.04	-0.15	-1.72	0.08	7	7	12	6	7
DEC. 2	0.01	0.21	0.56	-0.05	-2.00	0.10	-0.01	-0.10	0.76	-0.06	-1.19	0.21	-0.08	-1.04	0.36	14	7	11	8	11
DEC. 3	-0.02	-0.47	0.73	-0.04	-1.16	0.38	-0.01	-0.40	0.57	-0.05	-0.78	0.31	-0.01	-0.11	0.44	13	11	9	10	10
DEC. 4	0.01	0.30	0.77	-0.01	-0.38	0.71	-0.07	-1.77	0.06	0.01	0.16	0.78	-0.06	-0.60	0.39	13	9	9	9	10
DEC. 5	0.02	0.53	0.43	0.00	-0.09	0.99	-0.07	-1.56	0.17	0.05	0.69	0.73	-0.01	-0.13	0.65	14	10	9	10	8
DEC. 6	0.04	1.11	0.12	-0.02	-0.48	0.74	-0.02	-0.79	0.41	0.02	0.30	0.58	0.04	0.56	0.86	17	12	8	14	11
DEC. 7	-0.04	-1.11	0.30	0.00	-0.11	0.99	-0.02	-0.67	0.65	-0.02	-0.25	0.84	-0.02	-0.19	0.92	10	12	11	13	13
DEC. 8	-0.03	-0.73	0.71	-0.04	-1.05	0.21	0.04	1.18	0.34	-0.05	-0.84	0.60	0.06	0.57	0.76	12	10	14	11	12
DEC. 9	-0.04	-1.49	0.22	-0.09	-1.98	0.07	-0.07	-2.49	0.05	-0.15	-2.40	0.03	-0.24	-3.58	0.00	9	6	6	6	6
DEC. 10	-0.09	-3.68	0.00	-0.01	-0.17	0.77	-0.04	-1.14	0.29	-0.12	-1.62	0.09	-0.15	-1.70	0.04	5	12	8	7	7
DEC(1-10)	0.01	0.29	0.56	-0.02	-0.40	0.56	0.01	0.19	0.80	0.01	0.12	0.88	0.01	0.08	0.93	14	9	14	11	13

* Note: a figure of, say, M.A.R = -0.08 should be interpreted as Market-Adjusted Returns of -8% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.03	-0.51	0.36	-0.01	-0.14	0.47	0.05	0.71	0.65	-0.05	-0.58	0.41	0.02	0.11	0.40	9	8	13	10	8
DEC. 2	-0.04	-0.65	0.34	-0.05	-1.10	0.37	-0.01	-0.26	0.76	-0.07	-0.78	0.29	-0.09	-0.54	0.13	10	9	11	7	7
DEC. 3	-0.01	-0.28	0.80	0.10	1.98	0.07	-0.01	-0.29	0.69	0.13	1.50	0.22	0.15	1.23	0.22	10	16	8	12	13
DEC. 4	0.06	1.21	0.27	-0.05	-1.13	0.27	0.05	0.95	0.96	0.01	0.20	0.96	0.11	0.99	0.67	14	8	10	10	10
DEC. 5	0.03	0.60	0.81	0.04	0.83	0.48	-0.05	-1.08	0.24	0.10	1.09	0.41	0.11	0.76	0.82	12	12	9	12	14
DEC. 6	-0.01	-0.39	0.55	0.04	0.94	0.51	-0.04	-1.10	0.19	0.00	-0.02	0.83	-0.06	-0.68	0.24	11	13	9	10	9
DEC. 7	-0.08	-1.98	0.02	-0.03	-0.95	0.37	0.01	0.10	0.78	-0.15	-2.98	0.01	-0.18	-2.15	0.05	6	9	12	6	8
DEC. 8	-0.05	-1.24	0.20	0.00	0.02	0.85	0.07	1.34	0.24	-0.03	-0.57	0.34	0.08	0.72	0.81	9	9	12	10	11
DEC. 9	-0.02	-0.37	0.64	-0.07	-1.49	0.09	-0.06	-1.63	0.17	-0.11	-1.88	0.09	-0.21	-2.73	0.03	10	10	7	9	8
DEC. 10	-0.04	-0.81	0.16	-0.09	-2.11	0.09	-0.05	-1.27	0.09	-0.16	-2.16	0.05	-0.26	-2.82	0.01	8	7	7	8	5
DEC(1-10)	0.01	0.14	0.95	0.08	1.14	0.44	0.10	1.43	0.17	0.11	0.86	0.46	0.28	1.29	0.21	10	14	12	13	15

* Note: a figure of, say, M.A.R = -0.03 should be interpreted as Market-Adjusted Returns of -3% calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 6.3.2

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.01	0.26	0.72	-0.04	-0.90	0.50	-0.03	-0.59	0.25	-0.02	-0.29	0.52	0.00	-0.02	0.36	8	10	7	12	8
DEC. 2	0.01	0.39	0.63	-0.01	-0.24	0.48	-0.03	-0.74	0.39	0.01	0.14	0.95	-0.03	-0.36	0.78	12	11	9	10	13
DEC. 3	0.03	0.83	0.52	-0.02	-0.54	0.81	-0.05	-1.29	0.26	0.01	0.27	0.76	-0.03	-0.40	0.61	12	12	10	12	9
DEC. 4	-0.01	-0.30	0.63	-0.02	-0.49	0.76	-0.03	-1.04	0.27	-0.01	-0.22	0.86	-0.06	-0.75	0.39	10	11	10	12	10
DEC. 5	-0.03	-0.91	0.47	0.00	0.07	0.95	0.02	0.72	0.63	-0.02	-0.32	0.67	0.01	0.15	0.98	12	12	11	11	9
DEC. 6	0.00	0.02	0.98	-0.04	-1.19	0.19	-0.03	-1.01	0.24	-0.05	-0.86	0.35	-0.09	-1.33	0.25	12	8	6	8	9
DEC. 7	-0.02	-0.58	0.81	-0.01	-0.48	0.45	0.00	-0.13	0.90	-0.03	-0.66	0.58	-0.03	-0.37	0.67	12	10	10	11	10
DEC. 8	0.04	1.77	0.13	-0.02	-0.65	0.72	-0.01	-0.25	0.83	0.02	0.45	0.83	0.01	0.09	0.83	13	13	12	13	11
DEC. 9	-0.06	-1.63	0.10	-0.02	-0.43	0.76	0.00	0.00	0.86	-0.06	-1.06	0.12	-0.10	-1.45	0.15	8	10	12	8	8
DEC. 10	-0.07	-2.40	0.04	-0.03	-0.96	0.50	-0.06	-1.91	0.04	-0.11	-2.23	0.05	-0.19	-3.13	0.01	8	13	8	7	5
DEC(1-10)	0.08	2.03	0.09	0.00	-0.11	0.56	0.03	0.66	0.90	0.09	1.31	0.29	0.19	1.37	0.38	12	9	11	12	14

* Note: a figure of, say, M.A.R = 0.01 should be interpreted as Market-Adjusted Returns of 1% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.11	0.74	-0.10	-2.31	0.02	-0.01	-0.21	0.69	-0.13	-1.76	0.07	-0.15	-1.55	0.09	13	5	13	7	10
DEC. 2	-0.02	-0.51	0.56	0.01	0.21	0.83	-0.01	-0.37	0.61	-0.01	-0.26	0.72	-0.03	-0.34	0.76	10	11	10	11	10
DEC. 3	-0.03	-1.06	0.72	0.03	0.98	0.30	-0.02	-0.69	0.48	-0.01	-0.16	0.98	-0.03	-0.52	0.88	12	13	9	13	12
DEC. 4	0.00	0.10	0.67	-0.02	-0.72	0.48	0.02	0.57	0.67	-0.01	-0.11	0.76	0.03	0.36	0.78	13	10	12	9	11
DEC. 5	-0.03	-0.82	0.54	0.02	0.63	0.74	0.03	1.07	0.27	0.00	-0.07	0.93	0.05	0.54	0.38	11	12	15	13	13
DEC. 6	0.03	0.99	0.26	0.07	1.82	0.13	-0.06	-1.74	0.16	0.11	2.07	0.09	0.03	0.45	0.90	15	15	10	14	11
DEC. 7	0.02	0.97	0.38	0.02	0.52	0.95	0.06	1.73	0.22	0.03	0.78	0.86	0.12	1.74	0.14	16	10	14	11	13
DEC. 8	0.00	0.10	0.88	0.00	-0.04	0.86	-0.02	-0.71	0.58	0.00	0.09	0.98	0.00	0.02	0.98	12	11	10	11	12
DEC. 9	-0.07	-2.27	0.04	-0.06	-2.03	0.05	0.00	-0.06	0.69	-0.14	-2.78	0.01	-0.18	-2.44	0.01	5	6	11	6	7
DEC. 10	0.01	0.26	0.95	-0.07	-2.43	0.04	-0.08	-2.00	0.04	-0.07	-1.26	0.20	-0.18	-2.33	0.04	11	8	7	10	8
DEC(1-10)	-0.01	-0.28	0.81	-0.03	-0.69	0.43	0.07	1.32	0.10	-0.06	-0.88	0.36	0.03	0.24	0.95	11	9	15	9	10

* Note: a figure of, say, M.A.R = -0.01 should be interpreted as Market-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 6.3.3

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-
DEC. 1	-0.07	-3.06	0.01	-0.03	-0.72	0.18	0.00	0.08	0.50	-0.12	-2.31	0.04	-0.11	-1.21	0.11
DEC. 2	0.01	0.41	0.63	-0.08	-3.50	0.00	-0.02	-0.63	0.41	-0.08	-1.82	0.04	-0.12	-1.61	0.11
DEC. 3	-0.01	-0.16	0.76	-0.02	-0.71	0.61	0.00	0.09	0.98	-0.02	-0.42	0.74	0.00	0.02	0.88
DEC. 4	0.01	0.40	0.65	-0.01	-0.24	0.86	-0.04	-1.08	0.24	0.01	0.18	0.95	-0.03	-0.38	0.26
DEC. 5	0.02	0.66	0.58	-0.01	-0.23	0.88	-0.05	-1.21	0.11	0.01	0.19	0.83	-0.01	-0.10	0.81
DEC. 6	0.04	0.94	0.36	-0.03	-0.90	0.36	-0.03	-1.10	0.56	0.01	0.10	0.90	-0.02	-0.21	0.83
DEC. 7	-0.04	-1.12	0.43	0.03	0.73	0.52	0.00	-0.04	0.72	0.01	0.07	0.76	0.04	0.42	0.63
DEC. 8	-0.01	-0.24	0.98	0.00	0.00	0.78	-0.02	-0.56	0.69	0.00	0.01	0.95	0.00	0.01	0.86
DEC. 9	-0.03	-1.01	0.38	-0.06	-1.96	0.09	-0.06	-1.86	0.08	-0.11	-2.32	0.01	-0.21	-2.73	0.01
DEC. 10	-0.09	-3.16	0.00	-0.01	-0.20	0.78	-0.06	-1.93	0.05	-0.11	-1.90	0.06	-0.20	-2.74	0.01
DEC(1-10)	0.02	0.55	0.61	-0.03	-0.43	0.48	0.06	1.62	0.17	0.00	-0.04	0.98	0.09	0.88	0.36

* Note: a figure of, say, M.A.R = -0.07 should be interpreted as Market-Adjusted Returns of -7% calculated over the first 12 months as from portfolio formation.

No. of (+) M.A.R

	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	6	8	9	6	7
DEC. 2	13	6	7	6	8
DEC. 3	10	11	11	11	9
DEC. 4	12	10	10	11	9
DEC. 5	11	13	6	11	9
DEC. 6	12	9	12	11	12
DEC. 7	11	13	14	13	13
DEC. 8	10	14	11	11	11
DEC. 9	8	7	7	5	6
DEC. 10	4	12	8	6	6
DEC(1-10)	13	10	16	11	14

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-
DEC. 1	-0.06	-1.13	0.06	-0.06	-1.31	0.15	-0.02	-0.34	0.86	-0.12	-1.33	0.04	-0.22	-2.53	0.00
DEC. 2	-0.08	-1.62	0.15	0.03	0.65	0.58	-0.01	-0.28	0.90	-0.06	-1.09	0.30	-0.06	-0.57	0.45
DEC. 3	0.02	0.80	0.27	0.06	1.50	0.08	-0.05	-1.17	0.07	0.13	1.89	0.11	0.14	1.07	0.65
DEC. 4	0.01	0.35	0.93	-0.04	-0.90	0.47	0.00	-0.11	0.88	-0.01	-0.09	0.90	0.01	0.09	0.65
DEC. 5	0.05	1.12	0.38	0.05	1.10	0.50	-0.03	-0.67	0.32	0.13	1.53	0.21	0.14	1.01	0.86
DEC. 6	0.01	0.33	0.56	-0.05	-1.71	0.11	0.01	0.28	0.95	-0.05	-0.93	0.39	-0.04	-0.56	0.35
DEC. 7	-0.06	-1.92	0.08	-0.02	-0.52	0.25	-0.01	-0.27	0.90	-0.10	-2.00	0.07	-0.14	-2.39	0.04
DEC. 8	-0.01	-0.28	0.61	0.00	-0.08	0.93	0.03	0.84	0.56	-0.02	-0.37	0.69	0.03	0.32	0.95
DEC. 9	0.00	0.09	0.76	-0.09	-2.18	0.03	-0.01	-0.19	1.00	-0.10	-1.63	0.12	-0.13	-1.40	0.14
DEC. 10	-0.07	-1.43	0.21	-0.06	-1.16	0.22	-0.05	-1.26	0.22	-0.16	-2.53	0.02	-0.27	-3.25	0.01
DEC(1-10)	0.01	0.12	0.86	0.00	0.01	0.98	0.04	0.67	0.58	0.04	0.32	0.81	0.05	0.34	0.69

* Note: a figure of, say, M.A.R = -0.06 should be interpreted as Market-Adjusted Returns of -6% calculated over the first 12 months as from portfolio formation.

No. of (+) M.A.R

	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	7	8	12	6	4
DEC. 2	9	10	13	9	10
DEC. 3	14	15	7	16	12
DEC. 4	11	9	12	12	10
DEC. 5	13	10	8	13	11
DEC. 6	14	7	10	9	9
DEC. 7	7	8	11	6	9
DEC. 8	9	11	10	11	11
DEC. 9	13	6	11	7	8
DEC. 10	9	9	9	6	7
DEC(1-10)	11	10	12	12	12

SAMPLE (D):

TABLE 6.3.4

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECONI 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.48	0.47	-0.05	-1.22	0.24	-0.02	-0.71	0.52	-0.05	-0.83	0.14	-0.06	-0.58	0.17	8	9	10	7	7
DEC. 2	0.07	3.02	0.01	0.01	0.41	0.58	-0.03	-1.15	0.52	0.10	3.72	0.00	0.09	1.62	0.14	18	14	11	16	14
DEC. 3	-0.01	-0.19	0.81	-0.03	-0.79	0.48	-0.03	-0.98	0.47	-0.04	-0.79	0.48	-0.08	-1.05	0.33	11	9	9	8	9
DEC. 4	0.00	0.03	0.86	-0.02	-0.76	0.58	-0.05	-1.49	0.11	-0.01	-0.24	0.95	-0.06	-0.77	0.58	12	10	8	12	10
DEC. 5	0.00	-0.11	0.90	0.02	0.81	0.21	0.04	1.81	0.11	0.04	0.77	0.65	0.11	1.67	0.38	10	15	13	12	11
DEC. 6	-0.01	-0.17	0.98	-0.01	-0.22	0.83	-0.03	-1.30	0.16	-0.02	-0.36	0.63	-0.05	-0.81	0.54	12	12	9	11	8
DEC. 7	-0.01	-0.28	0.90	-0.01	-0.19	0.93	0.01	0.52	0.54	-0.01	-0.19	0.83	0.01	0.20	0.93	12	13	13	12	11
DEC. 8	0.02	0.68	0.61	-0.02	-0.69	0.88	-0.03	-1.07	0.50	0.00	-0.11	0.63	-0.06	-1.03	0.30	13	11	10	10	9
DEC. 9	-0.04	-1.45	0.27	-0.03	-0.95	0.63	0.00	-0.18	0.61	-0.06	-1.43	0.11	-0.08	-1.38	0.21	12	12	9	8	8
DEC. 10	-0.06	-1.99	0.06	-0.02	-0.98	0.39	-0.05	-1.54	0.17	-0.08	-2.20	0.03	-0.12	-2.22	0.05	8	8	10	6	9
DEC(1-10)	0.04	1.06	0.88	-0.03	-0.65	0.56	0.03	0.74	0.98	0.03	0.39	0.90	0.06	0.64	0.67	10	10	12	9	12

* Note: a figure of, say, M.A.R = -0.01 should be interpreted as Market-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECONI 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.04	-1.12	0.38	-0.06	-1.42	0.21	0.02	0.75	0.43	-0.11	-1.76	0.06	-0.09	-0.94	0.20	11	10	14	8	11
DEC. 2	0.01	0.32	0.69	0.02	0.54	0.74	-0.03	-1.06	0.22	0.02	0.46	1.00	-0.03	-0.41	0.52	12	11	8	12	9
DEC. 3	-0.04	-1.33	0.47	-0.03	-0.93	0.47	-0.03	-1.27	0.16	-0.08	-2.02	0.10	-0.12	-2.01	0.12	11	11	8	7	9
DEC. 4	0.01	0.49	1.00	-0.04	-1.20	0.27	0.00	-0.04	0.78	-0.02	-0.33	0.52	-0.01	-0.08	0.61	10	10	12	9	10
DEC. 5	-0.02	-0.76	0.52	0.03	1.28	0.17	0.03	1.35	0.10	0.02	0.32	0.76	0.06	0.78	0.27	12	15	15	14	13
DEC. 6	0.01	0.39	0.86	0.02	0.62	0.63	0.00	0.00	0.98	0.03	0.69	0.72	0.04	0.60	0.83	12	14	14	12	12
DEC. 7	0.00	-0.09	0.98	0.04	1.32	0.25	0.03	1.06	0.45	0.04	0.96	0.52	0.08	1.47	0.14	11	14	13	12	13
DEC. 8	-0.01	-0.36	0.72	0.00	-0.20	0.83	-0.05	-1.64	0.04	-0.02	-0.41	0.56	-0.07	-1.06	0.20	11	10	7	9	10
DEC. 9	-0.06	-2.53	0.04	-0.08	-2.30	0.04	-0.03	-0.91	0.32	-0.16	-3.33	0.01	-0.23	-3.50	0.00	7	6	9	7	4
DEC. 10	0.02	0.59	0.69	-0.04	-1.59	0.17	-0.08	-1.94	0.13	-0.02	-0.55	0.52	-0.13	-1.75	0.11	13	9	10	11	10
DEC(1-10)	-0.06	-1.29	0.24	-0.02	-0.37	0.72	0.11	1.86	0.06	-0.09	-1.18	0.26	0.04	0.37	0.78	8	9	16	9	14

* Note: a figure of, say, M.A.R = -0.04 should be interpreted as Market-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 6.3.5

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.04	-1.43	0.09	-0.03	-1.12	0.17	-0.03	-1.04	0.16	-0.06	-1.45	0.05	-0.07	-0.98	0.07	10	7	7	7	6
DEC. 2	0.01	0.42	0.42	-0.03	-1.52	0.06	-0.02	-0.50	0.43	-0.02	-0.67	0.30	-0.05	-1.03	0.42	12	7	10	10	8
DEC. 3	0.01	0.20	0.87	-0.03	-1.22	0.45	-0.03	-1.26	0.27	-0.02	-0.45	0.63	-0.02	-0.33	0.36	13	11	10	12	11
DEC. 4	0.00	0.01	0.97	-0.02	-0.62	0.49	-0.05	-2.04	0.04	0.00	-0.03	0.81	-0.06	-0.95	0.30	11	11	9	11	10
DEC. 5	0.00	-0.12	0.98	0.00	-0.02	0.92	-0.03	-1.01	0.42	0.02	0.37	0.95	0.00	-0.02	0.75	10	11	8	11	10
DEC. 6	0.02	0.76	0.22	-0.03	-1.14	0.27	-0.02	-1.29	0.14	-0.02	-0.36	0.74	-0.03	-0.51	0.44	15	9	8	10	9
DEC. 7	-0.03	-1.22	0.34	-0.01	-0.37	0.59	-0.01	-0.59	0.76	-0.02	-0.58	0.81	-0.02	-0.38	0.66	8	9	9	11	10
DEC. 8	0.01	0.38	0.44	-0.03	-1.22	0.25	0.02	0.73	0.61	-0.02	-0.41	0.81	0.03	0.54	0.85	13	8	12	11	11
DEC. 9	-0.05	-2.23	0.05	-0.05	-1.78	0.09	-0.03	-1.52	0.21	-0.11	-2.47	0.01	-0.17	-3.49	0.00	8	8	13	6	5
DEC. 10	-0.08	-4.21	0.00	-0.02	-0.74	0.85	-0.05	-2.13	0.03	-0.11	-2.63	0.01	-0.17	-3.18	0.00	3	11	7	9	6
DEC(1-10)	0.05	1.64	0.12	-0.01	-0.38	0.40	0.02	0.62	0.72	0.05	0.96	0.54	0.10	1.14	0.36	16	11	10	10	14

* Note: a figure of, say, M.A.R = -0.04 should be interpreted as Market-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.02	-0.47	0.59	-0.06	-1.40	0.03	0.02	0.50	0.80	-0.09	-1.54	0.08	-0.07	-0.64	0.07	10	5	10	7	7
DEC. 2	-0.03	-0.82	0.29	-0.02	-0.80	0.45	-0.01	-0.43	0.63	-0.04	-0.82	0.22	-0.06	-0.65	0.15	10	12	10	10	9
DEC. 3	-0.02	-0.85	0.52	0.06	2.19	0.04	-0.02	-0.65	0.39	0.06	1.30	0.37	0.06	0.87	0.43	11	15	10	14	13
DEC. 4	0.03	0.98	0.29	-0.04	-1.34	0.21	0.03	1.11	0.76	0.00	0.07	0.81	0.07	1.01	0.62	13	7	9	10	13
DEC. 5	0.00	0.10	0.78	0.03	1.05	0.49	-0.01	-0.34	0.85	0.05	0.88	0.57	0.08	0.94	0.50	10	11	9	12	12
DEC. 6	0.01	0.30	0.71	0.06	1.90	0.12	-0.05	-2.03	0.06	0.06	1.34	0.32	-0.01	-0.27	0.42	12	15	7	15	10
DEC. 7	-0.03	-1.42	0.14	-0.01	-0.32	0.55	0.03	1.02	0.30	-0.06	-1.67	0.05	-0.03	-0.52	0.63	9	9	15	9	9
DEC. 8	-0.02	-0.90	0.47	0.00	-0.01	0.86	0.02	0.89	0.57	-0.01	-0.40	0.52	0.04	0.63	0.98	11	12	11	8	10
DEC. 9	-0.04	-1.55	0.10	-0.07	-2.41	0.02	-0.03	-1.12	0.20	-0.13	-3.27	0.00	-0.20	-3.69	0.00	8	8	9	6	6
DEC. 10	-0.02	-0.54	0.29	-0.08	-3.15	0.01	-0.07	-2.35	0.01	-0.11	-2.49	0.02	-0.22	-3.68	0.00	9	8	7	6	3
DEC(1-10)	0.00	-0.03	0.89	0.03	0.60	0.95	0.09	1.96	0.04	0.02	0.33	0.94	0.15	1.26	0.33	14	13	15	12	14

* Note: a figure of, say, M.A.R = -0.02 should be interpreted as Market-Adjusted Returns of -2% calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D):

TABLE 6.3.6

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED MARKET-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Market-Adjusted Returns (M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.04	-2.37	0.02	-0.04	-1.36	0.09	-0.01	-0.39	0.32	-0.08	-2.09	0.01	-0.08	-1.27	0.04	7	9	10	5	8
DEC. 2	0.04	2.17	0.02	-0.04	-2.14	0.06	-0.03	-1.17	0.24	0.01	0.25	0.83	-0.01	-0.28	0.80	16	6	7	11	12
DEC. 3	-0.01	-0.25	0.73	-0.02	-1.06	0.34	-0.02	-0.67	0.60	-0.03	-0.89	0.35	-0.04	-0.86	0.39	12	10	11	10	9
DEC. 4	0.01	0.30	0.68	-0.01	-0.70	0.62	-0.04	-1.80	0.06	0.00	-0.04	1.00	-0.05	-0.80	0.22	10	12	8	11	10
DEC. 5	0.01	0.39	0.75	0.01	0.28	0.47	0.00	-0.21	0.79	0.02	0.63	0.63	0.05	0.81	0.64	10	12	11	15	13
DEC. 6	0.02	0.61	0.44	-0.02	-0.82	0.44	-0.03	-1.72	0.13	-0.01	-0.15	0.82	-0.03	-0.68	0.60	13	10	10	10	8
DEC. 7	-0.02	-1.04	0.64	0.01	0.46	0.71	0.01	0.32	0.43	0.00	-0.04	0.94	0.02	0.46	0.71	11	13	12	11	13
DEC. 8	0.00	0.25	0.78	-0.01	-0.49	0.93	-0.03	-1.18	0.47	0.00	-0.05	0.86	-0.03	-0.65	0.57	15	12	10	12	10
DEC. 9	-0.04	-1.76	0.13	-0.05	-2.11	0.10	-0.03	-1.60	0.12	-0.09	-2.70	0.00	-0.14	-2.97	0.01	9	9	9	6	7
DEC. 10	-0.07	-3.65	0.00	-0.01	-0.73	0.46	-0.06	-2.47	0.02	-0.10	-2.81	0.00	-0.16	-3.53	0.00	7	11	7	5	5
DEC(1-10)	0.03	1.20	0.65	-0.03	-0.73	0.36	0.05	1.70	0.32	0.01	0.25	0.99	0.08	1.08	0.37	13	8	10	12	13

* Note: a figure of, say, M.A.R = -0.04 should be interpreted as Market-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Market-Adjusted Returns (M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) M.A.R				
DECILE	M.A.R*	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.05	-1.58	0.03	-0.06	-1.94	0.05	0.00	0.15	0.71	-0.12	-2.11	0.00	-0.16	-2.43	0.00	5	9	10	6	5
DEC. 2	-0.03	-1.18	0.37	0.02	0.85	0.57	-0.02	-0.86	0.48	-0.02	-0.55	0.45	-0.05	-0.71	0.36	7	13	11	12	11
DEC. 3	-0.01	-0.44	0.90	0.02	0.63	0.47	-0.04	-1.67	0.02	0.02	0.54	0.83	0.01	0.15	0.49	12	13	7	12	10
DEC. 4	0.01	0.59	0.89	-0.04	-1.44	0.21	0.00	-0.10	0.78	-0.01	-0.29	0.58	0.00	0.00	0.52	13	8	11	12	12
DEC. 5	0.02	0.51	0.79	0.04	1.63	0.26	0.00	-0.03	0.87	0.07	1.45	0.25	0.10	1.27	0.39	9	13	11	13	15
DEC. 6	0.01	0.49	0.60	-0.02	-0.80	0.43	0.00	0.22	0.89	-0.01	-0.25	0.76	0.00	-0.01	0.61	12	11	10	9	10
DEC. 7	-0.03	-1.68	0.16	0.01	0.37	0.99	0.01	0.38	0.67	-0.03	-0.78	0.36	-0.03	-0.73	0.60	10	9	11	10	12
DEC. 8	-0.01	-0.45	0.58	0.00	-0.18	0.91	-0.01	-0.31	0.37	-0.02	-0.55	0.49	-0.02	-0.38	0.46	9	13	8	8	9
DEC. 9	-0.03	-1.26	0.31	-0.09	-3.18	0.00	-0.02	-0.76	0.51	-0.13	-3.31	0.00	-0.18	-3.17	0.00	11	4	12	6	6
DEC. 10	-0.03	-0.91	0.45	-0.05	-1.75	0.06	-0.07	-2.29	0.05	-0.09	-2.33	0.04	-0.20	-3.58	0.00	7	8	9	6	5
DEC(1-10)	-0.03	-0.60	0.57	-0.01	-0.18	0.84	0.07	1.81	0.08	-0.02	-0.31	0.52	0.04	0.50	0.69	13	12	13	12	13

* Note: a figure of, say, M.A.R = -0.05 should be interpreted as Market-Adjusted Returns of -5% calculated over the first 12 months as from portfolio formation.

Results for all samples –(averaged over the 36 month-test periods)- indicate materially negative abnormal returns for deciles 9 or/and 10 (i.e., the highest abnormal accruals deciles). Returns of at least one of these two deciles are statistically significant at the 95% level of confidence and sometimes at the 99% level of confidence using the two-tailed test [6].

E.g., deciles 9, and 10 for sample (A+B) produces equally-weighted market-adjusted returns of -17% (t-stat. -3.49, Wilc. 0.002) and -17% (t-stat. -3.18, Wilc. 0.001), respectively, and deciles 9 and 10 of sample (C+D) produces equally-weighted market-adjusted returns of -14% (t-stat. -2.97, Wilc. 0.005) and -16% (t-stat. -3.53, Wilc. 0.001), respectively.

The test provides evidence to support the acceptance of the first *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns.

Contrary to what was expected, we find that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero.

The arbitrage portfolio (the third hypothesis of this study) produces statistically insignificant positive abnormal returns for all six samples. The highest immaterial positive adjusted return is 19% (t-stat. 1.37, Wilc. 0.378) for sample (B). Also, samples (A+B) and (C+D) produce adjusted returns of 10% (t-stat. 1.14, Wilc. 0.356) and 8% (t-stat. 1.08, Wilc. 0.367), respectively, leading to accepting that investing in the arbitrage portfolio produces equally-weighted market-adjusted returns undifferentiated from zero.

This finding contrasts with that of Houge and Loughran (2000) who employ the equally-weighted method to US data for the period 1963-1994 and provide evidence that the hedge portfolio defined as buying long the lowest accruals decile and selling the highest produces

[6] The t-statistic critical values are 2.00 and 2.8 at the 5% and 1% two-tailed tests, respectively. Confirming 'p' values of the non-parametric Wilcoxon Signed Rank Test (w.t-) are also reported.

average market-adjusted returns of 8.2%, 4.2%, and 4.2% annually for the first, second, and third year following portfolio formations, respectively. *(Unfortunately, Houge and Loughran (2000) report these results for the hedge portfolio on page 167 of their study without being tested statistically).*

We also note that for all six samples there are more negative than positive market-adjusted returns. We suggest, as will be shown in section 6.3.1.3 of this chapter that the greater number of negatives can be attributed to a sample selection bias related to the firm-size phenomenon. In chapter three we discussed the merits and demerits of the time-series MJM against its counterpart cross-sectional application, and it has been shown that a possible limitation of the time-series application is the focus on a specific type of firms (i.e., the selection bias). In relation with this study, for a company to be included in a sample it has a minimum of 12 years of data. Companies with longer history are likely to be well established companies with larger sizes. Larger firms are documented on the extended time periods to earn less return than smaller firms.

It also can be noticed that deciles' adjusted returns do not fit into a pattern for any of the six samples other than a negative market-adjusted performance for the two highest abnormal accrual deciles over 36 months.

6.3.1.2 Value-Weighted Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (B) of tables 6.3.1, 6.3.2, 6.3.3, 6.3.4, 6.3.5, and 6.3.6 presents the value-weighted market-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively. Results of the value-weighted market-adjusted returns are very similar to those of the equally-weighted for deciles 9 and 10, while indicating more negative adjusted returns for deciles 1 and 2.

Accumulated over 36 months, significant negative abnormal returns are observed for deciles 9 or/and 10 (i.e., the highest abnormal accruals deciles) at the 95% level of confidence and sometimes at the 99% level of confidence using the two-tailed test.

E.g., deciles 9, and 10 for sample (A+B) produces value-weighted market-adjusted returns of -20% (t-stat. -3.69, Wilc. 0.001) and -22% (t-stat. -3.68, Wilc. 0.001), respectively, and deciles 9 and 10 of sample (C+D) produces value-weighted market-adjusted returns of -18% (t-stat. -3.17, Wilc. 0.003) and -20% (t-stat. -3.58, Wilc. 0.002), respectively.

As in the equally-weighted market-adjusting test, the value-weighted test statistically suggests accepting the first *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns.

On the other hand, under the value-weighted approach, deciles 1 and 2 produce more negative adjusted returns than the equally-weighted approach. Statistically, significant negative value-weighted adjusted returns are observed for samples (C) and (C+D). Over three years from portfolio formations, deciles 1 for samples (C) and (C+D) produce value-weighted market-adjusted returns of -22% (t-stat. -2.53, Wilc. 0.004) and -16% (t-stat. -2.43, Wilc. 0.003), respectively.

And so, as in the equally-weighted test the *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted.

Regarding the arbitrage portfolio hypothesis, all arbitrage portfolios for all six samples produce insignificant positive value-weighted market-adjusted returns; the highest is 28% (t-stat. 1.29, Wilc. 0.207) for sample (A). Samples (A+B) and (C+D) produce adjusted returns of 15% (t-stat. 1.26, Wilc. 0.334) and 4% (t-stat. 0.50, Wilc. 0.690), respectively. That is we accept the *hypothesis* that investing in the arbitrage portfolio produces value-weighted market-adjusted returns indistinguishable from zero.

6.3.1.3 A Comment on the Equally- and Value-Weighted Market-Adjusted Results

Both the equally- and value-weighted approaches essentially produce the same overall results. Abnormal accruals deciles 9 and 10 were found to produce significant negative market-adjusted returns (the first hypothesis).

On the other hand, contrary to producing positive abnormal returns, deciles number 1 and 2 were found to produce negative and sometimes statistically negative market-adjusted returns (the second hypothesis). Producing negative abnormal returns for the lowest abnormal accruals deciles 1 and 2 made investing in the arbitrage portfolio unprofitable, although the arbitrage portfolio managed to earn positive market-adjusted returns for all the equally- as well as value-adjusting tests for all six samples.

The high occurrences of negative market-adjusted returns with the equally-weighted method were diminished by moving to the value-weighted method, possibly reflecting in part a small firm effect.

The final effect on deciles' market-adjusted returns resulting from moving from equally- to value-weighted method depends on the sub-effects on each of the 10 sample deciles' and related market-indices' raw returns. Generally speaking, both returns are expected to decrease as a result of putting higher/ lower weights on larger firms (with lower returns)/ smaller firms (with higher returns), respectively.

As proposed in the previous section the samples in this study include a higher proportion of large firms compared with the market-indices. And so, all else equal, one would expect that raw returns on the market portfolios will decrease more than the decrease in raw returns on the samples, increasing the possibility of observing *positive* market-adjusted returns for the sample deciles. However, the existence of few extremely large firms in a specific sample (*decile*) could widen the distance between returns on the sample and on the market index by moving from the equally to value-weighted approach as the effect of such firms on a sample decile consists of few shares is much more than on the broad market.

In this section we provide evidence that the samples disproportionately include large firms by recognising the size-composition for all the firm-years in a sample. At each of the 23 formation dates, shares in a market portfolio are sorted according to their market values and assigned to ten size deciles. Market-size decile 1 contains the smallest 10% of shares, and so on, till market-size decile number 10 that contains the largest 10% of shares. Then, sample shares distributed over the 10 abnormal accruals deciles are traced each to its corresponding market size-decile producing ten size-decile sources (i.e., columns), as appears in table 6.4, e.g., from the 340 firm-years in abnormal accrual decile number 1 in sample (A) 29 firms come from the smallest 10% of firms in the market, and so on.

By the end of this procedure we calculate percentages of all the observations in the one column -(as these relate to the same market size-decile)- to all the observations in all the columns. E.g., 8% and 13% of the firm-years in sample (A) and 5% and 15% of the firms in sample (B) are from the smallest and largest market size-deciles, respectively.

Table 6.4 presents descriptive analysis for the samples' (A, B, C, and D) corresponding market-share sizes, and confirms that all samples include small/large firms less/more than the market, respectively.

For a better evaluation of the effect of moving from the equally- to the value-weighted market-adjusting basis, we calculate the equally- and value-weighted buy-and-hold returns for a sample as a whole and for its related market indices. Return results are drawn on 23 portfolio formations and presented for five periods, as appears in table 6.5. By moving from

TABLE 6.4

SAMPLE DECILES ARE TRACED TO THE MARKET-INDEX SIZE-DECILE THEY BELONG TO.

Shares are sorted according to their market values as at the samples' (A, B, C, and D) formation dates. Market size decile number one/ten contains the smallest/biggest 10% of shares, respectively. Shares in a sample are traced each to its market-size decile. Results of sample shares' size-sources for samples are shown accumulated over all 23 test periods; i.e., reported results below are based on 3330, 4578, 4492, and 6079 observations for the samples, respectively.

SAMPLE (A) — *Abnormal Accruals Deciles*

	MARKET-INDEX SIZE DECILES										Total
	1	2	3	4	5	6	7	8	9	10	S-firms
1	29	32	41	30	28	46	36	33	36	29	340
2	34	30	30	30	37	34	37	35	33	37	337
3	30	26	30	29	20	37	38	31	47	45	333
4	32	24	30	31	30	30	35	30	39	51	332
5	31	23	32	21	22	39	38	25	44	53	328
6	24	26	23	19	27	32	50	36	45	48	330
7	22	19	25	28	26	31	37	32	52	55	327
8	26	31	35	19	33	27	40	33	36	53	333
9	21	23	30	31	35	35	32	42	54	30	333
10	21	26	33	41	38	32	34	51	34	27	337
Total											3330
%	8%	8%	9%	8%	9%	10%	11%	10%	13%	13%	100%

SAMPLE (B) — *Abnormal Accruals Deciles*

	MARKET-INDEX SIZE DECILES										Total
	1	2	3	4	5	6	7	8	9	10	S-firms
1	40	43	40	32	38	43	66	59	58	45	464
2	33	41	31	43	36	51	44	57	79	46	461
3	12	37	35	30	32	44	44	69	90	66	459
4	19	36	36	37	40	40	37	52	84	75	456
5	23	30	36	36	34	36	55	64	65	73	452
6	16	35	25	25	37	46	34	62	88	84	452
7	21	30	26	20	34	39	46	60	91	85	452
8	17	36	26	27	31	54	51	51	77	88	458
9	21	32	32	30	34	52	51	61	76	71	460
10	26	36	36	48	44	49	50	60	66	49	464
Total											4578
%	5%	8%	7%	7%	8%	10%	10%	13%	17%	15%	100%

SAMPLE (C) — *Abnormal Accruals Deciles*

1	37	47	53	50	46	56	44	42	40	39	454
2	33	42	50	57	35	48	48	50	39	51	453
3	34	52	35	34	29	54	50	53	52	55	448
4	29	43	49	37	33	36	48	47	68	54	444
5	29	51	45	41	34	47	47	45	46	61	446
6	26	33	34	29	32	48	49	60	60	74	445
7	29	36	45	47	29	35	52	57	51	69	450
8	32	39	39	37	43	48	55	46	54	58	451
9	28	37	35	57	42	46	45	63	58	37	448
10	31	31	51	54	53	41	53	57	49	33	453
Total											4492
%	7%	9%	10%	10%	8%	10%	11%	12%	12%	12%	100%

SAMPLE (D) — *Abnormal Accruals Deciles*

1	54	58	55	46	48	65	80	72	82	51	611
2	53	55	37	50	50	63	73	80	89	60	610
3	15	45	49	47	44	64	60	88	113	86	611
4	31	43	45	45	51	59	65	70	91	105	605
5	30	43	47	47	44	54	66	76	97	102	606
6	25	38	41	32	48	65	56	74	111	115	605
7	33	46	30	37	48	50	63	84	106	108	605
8	20	45	27	32	44	68	64	83	103	119	605
9	23	50	40	41	53	63	68	70	106	96	610
10	34	51	45	55	54	72	79	78	84	59	611
Total											6079
%	5%	8%	7%	7%	8%	10%	11%	13%	16%	15%	100%

Note that a figure of, say, 29 should be interpreted as 29 firms from all the firms in the lowest abnormal accruals decile in sample (A), i.e., 340 firms, are from the smallest market-size decile.
Also, a percentage of, say, 8% should be interpreted as 8% of all the shares in sample (A), i.e., 3330 shares, are from the smallest market-size decile.

the equally- to the value-weighted basis, samples (A, and C) suffer dramatic reductions in their returns [i.e., from 70.5% to 43.5% for sample (A), and from 65.4% to 44.8% for sample (C), all accumulated over three years].

Although table 6.4 predicted that samples (A, and C) could suffer more by switching to the value-weighted basis as they contain more small and less large firms than samples (B, and D), respectively, we continue investigating the possibility of some other reason behind the massive reduction in samples' (A, and C) returns compared with those of samples' (B, and D), under the value-weighted basis.

Basically, under a value-weighted basis, the relative influence of a share within a portfolio in determining portfolio's returns is positively correlated with the share's returns and size. Consequently, we note market values for all the shares in a sample as at each of the 23 formation dates, and sort the values to see if the samples (A, and C) from one side and (B, and D) from another side can be distinguished according to their shares' market values. We find three key companies –[in fact, these are the largest three companies in all the samples: British Petroleum (BP plc), Vodafone Group plc, and British Telecom (BT Group)]- significantly influence the samples' value-weighted returns. BP is tested in samples (B, and D) within 11 portfolio formations from 1992 to 2002 (i.e., over 13 years since a test period is 3 years). This company alone has a total capitalisation of £7.07e^{+11} aggregated over the 11 formations with a percentage of 24.2% and 20.1% of the total market values for all the shares in samples (B), and (D) over the 23 portfolio formations, respectively. The annual buy-and-hold returns for BP over the period (Jul/1992- Jun/2005) is positive 18.057%.

On the other hand, Vodafone and BT are tested in samples (A, and C) within 2 and 7 portfolio formations from (2000 to 2001) and (1995 to 2001), respectively, (i.e., over 4 and 9 years since a test period is 3 years).). BT suffered from bad performance over the last 4 out of 7

TABLE 6.5

EQUALLY- AND VALUE-WEIGHTED AVERAGES OF BUY-AND-HOLD RETURNS FOR THE SAMPLES (A, B, C, and D) AND THEIR RELATED MARKET INDICES.
(A SAMPLE RELATED MARKET-INDEX CONTAINS ALL THE MARKET SHARES WITH AVAILABLE RETURN RECORDS AS AT THE SAMPLE FORMATION DATES. AVERAGES OF RETURNS ARE DRAWN ON ALL 23 FORMATION PERIODS, AND PRESENTED FOR FIVE PERIODS: FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS AS FROM PORTFOLIO FORMATIONS).

DESCRIPTION	EQUALLY WEIGHTED AVERAGE BUY-AND-HOLD TEST PERIOD RETURNS FOR FIVE PERIODS AS FROM FORMATION					VALUE WEIGHTED AVERAGE BUY-AND-HOLD TEST PERIOD RETURNS FOR FIVE PERIODS AS FROM FORMATION				
	1st. 12M	2nd. 12M	3rd. 12M	1st. 24M	1st. 36M	1st. 12M	2nd. 12M	3rd. 12M	1st. 24M	1st. 36M
SAMPLE (A)	18.0%	19.2%	19.5%	40.8%	70.5%	12.0%	13.1%	14.7%	25.3%	43.5%
RELATED MARKET-INDEX	20.2%	22.1%	22.7%	45.6%	77.2%	15.8%	15.9%	16.7%	33.2%	55.7%
SAMPLE (B)	18.3%	18.0%	18.3%	41.1%	69.7%	14.1%	14.3%	15.0%	31.0%	51.3%
RELATED MARKET-INDEX	19.1%	20.0%	20.4%	43.9%	74.7%	15.0%	15.1%	15.7%	32.8%	54.6%
SAMPLE (C)	16.9%	18.3%	17.8%	38.8%	65.4%	12.2%	12.9%	13.1%	27.1%	44.8%
RELATED MARKET-INDEX	18.6%	20.6%	20.6%	43.1%	72.3%	15.6%	15.3%	15.5%	33.5%	54.9%
SAMPLE (D)	18.6%	18.4%	18.4%	42.2%	71.3%	13.9%	14.0%	14.5%	30.4%	50.2%
RELATED MARKET-INDEX	19.1%	20.0%	20.4%	43.9%	74.7%	15.0%	15.1%	15.7%	32.8%	54.6%

Note that a figure of, say, 18.0% should be interpreted as a buy-and-hold return of 18.0% over the first 12 months as from portfolio formations.

portfolio formations. Concerning sample (A) these two companies have a total capitalisation of £2.58e^{+11} and £1.87e^{+11} and concerning sample (C) £2.81e^{+11} and £2.16e^{+11}, all aggregated over the 2 and 4 formations, respectively. Vodafone represents a percentage of 13.526% and 12.273% and BT represents a percentage of 9.811% and 9.453% of the total market value for all the shares in samples (A), and (C) over the 23 portfolio formations, respectively. Regarding sample (A), the annual buy-and-hold returns for Vodafone over the period (Oct/2000- Sep/2004) is -13.854% (negative), and for BT over the period (Oct/1998- Sep/2004) is -15.051%. Regarding sample (C) the annual buy-and-hold returns for Vodafone over the period (Jan/2001- Dec/2004) is -11.574%, and for BT over the period (Jan/1999- Dec/2004) is -14.996% .

Finally, it is also important to note that we find deciles 1, 2, 9, and 10 disproportionately include higher percentages of smaller firms compared with the rest of the deciles as appears in table 6.6.

In table 6.6 we calculate mean and median values of shares' market capitalisations within the ten abnormal accruals deciles for the sample (A, B, C, and D). Shares' market capitalisations are considered as at portfolios' formation dates.

Regarding the mean values, we provide information on two levels. The first when all the shares within the sample are included, e.g., 3330 firms for sample (A). The second is based on all the observations in a sample after excluding the biggest 1% of shares (e.g., the biggest 30 out of 3330 firms tested for sample (A) are excluded). The reason for exclusion is that we notice a few very extreme large values in some of the sample, mainly sample (A).

Figure 6.1 plots three values for each abnormal accruals decile for the samples (A, B, C, and D). The first and second values are the share's mean with and without exclusion of the biggest

TABLE 6.6

MEANS AND MEDIANS OF COMPANY'S MARKET VALUES FOR SAMPLE DECILES CREATED ON THE BASIS OF SHARES' ABNORMAL ACCRUALS.
(RESULTS ARE PRESENTED FOR THE FOUR SAMPLES (A, B, C, and D) DRAWING ON ALL 23 PORTFOLIO FORMATIONS).

Panel (A): Firms' mean market values for different abnormal accruals deciles.

DESCRIPTION AND NUMBER OF FIRMS INCLUDED		THE MEAN FIRM'S MARKET VALUE IN £10000 FOR DIFFERENT DECILES: 1	2	3	4	5	6	7	8	9	10
SAMPLE (A) BEFORE EXCLUSION.	3330	100245	34932	64000	57206	80319	59668	60025	56176	26769	32560
AFTER EXCLUDING BIGGEST 1% (BIGGEST 30 FIRM-YEARS)	3300	16939	24219	36374	33393	41279	44217	48787	40279	26769	17414
SAMPLE (B) BEFORE EXCLUSION.	4578	39349	31397	48390	81636	81210	83861	69467	119165	58545	27472
AFTER EXCLUDING BIGGEST 1% (BIGGEST 50 FIRM-YEARS)	4528	22299	23074	40666	39434	39979	47294	46130	41404	40179	22669
SAMPLE (C) BEFORE EXCLUSION.	4492	86201	31993	57147	46104	77315	69489	49466	39427	23952	28688
AFTER EXCLUDING BIGGEST 1% (BIGGEST 50 FIRM-YEARS)	4442	15967	22584	24978	31405	32174	42460	39303	27915	22028	12078
SAMPLE (D) BEFORE EXCLUSION.	6079	35071	29282	45613	78611	84537	63849	56998	102011	58613	25434
AFTER EXCLUDING BIGGEST 1% (BIGGEST 60 FIRM-YEARS)	6019	22122	22992	36542	40778	44405	45835	42113	36197	41225	21784

* The biggest 1% of firm years for each decile -(3, 5, 5, and 6 firm-years for the samples, respectively)- are excluded to avoid distotions resulting from extremely large firms.
Note that a figure of, say, 100245 should be interpreted as a share's mean market value of £1,002,450,000.

Panel (B): Firms' median market values for different abnormal accruals deciles.

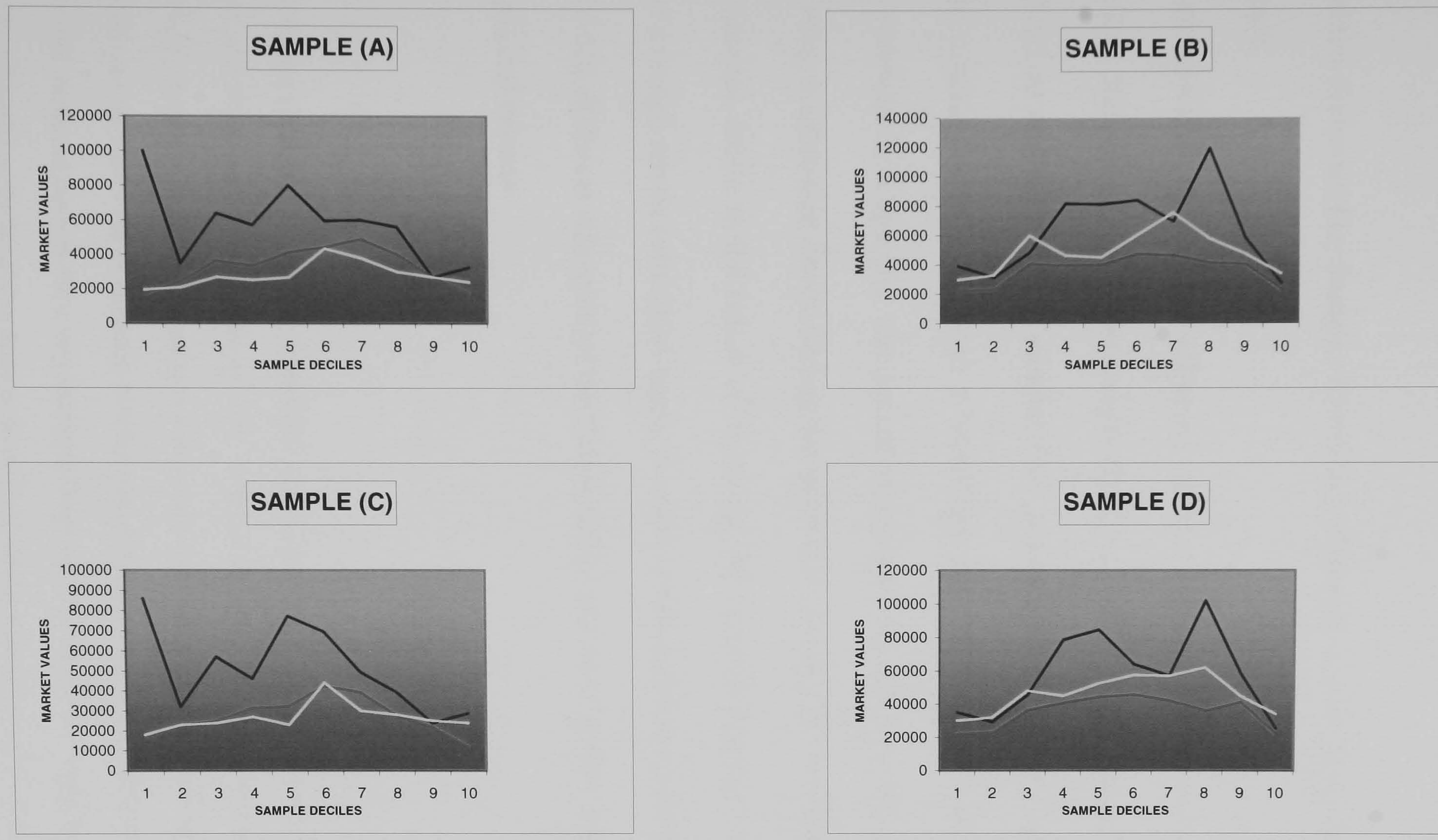
DESCRIPTION AND NUMBER OF FIRMS INCLUDED		MEDIANS OF FIRMS' MARKET VALUES IN £1000 FOR DIFFERENT DECILES: 1	2	3	4	5	6	7	8	9	10
SAMPLE (A)	3330	19500	21000	27000	25283	26855	43500	38000	30000	27000	23927
SAMPLE (B)	4578	30000	33000	60000	46500	45000	60248	75500	58000	47500	34000
SAMPLE (C)	4492	18000	23000	24000	27000	23000	44000	30000	28000	25000	24000
SAMPLE (D)	6079	30000	31935	48000	45000	52500	57496	57000	62000	45000	34000

Note that a figure of, say, 19500 should be interpreted as a share's median market value of £19,500,000.

FIGURE 6.1

MEAN AND MEDIAN MARKET VALUES OF SHARES WITHIN DIFFERENT ABNORMAL ACCRUALS DECILES.

(PLOTTED VALUES FOR EACH SAMPLE ARE BASED ON ALL THE SHARES IN THE SAME DECILE LEVEL OVER ALL 23 PORTFOLIO FORMATIONS).



The average (mean) share's market value in £10,000 based on all the observations in the one sample.
The average (mean) share's market value in £10,000 based on the observations in the one sample after excluding the largest 1% of the shares.
The median share's market value in £1,000 based on all the observations in the one sample.

1% of firms. The third value is the share's median (without exclusions).

The effect of smaller firms disproportionately populating the extreme deciles gave higher chances to observe lower adjusted returns for these deciles moving from the equally to the value-weighted adjusting method [7].

6.3.2 Size-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

In this test, sample deciles' returns are adjusted using returns calculated on size-control (matching) portfolios. Returns of a specific sample decile are adjusted by returns of a specific size-control portfolio, as was described in chapter five. A size-control portfolio consists of the same shares in the sample portfolio but with different returns. The original return on a share within a sample portfolio in a specific test period is replaced by the average return on the share's corresponding market-size decile during the same test period. The size-adjusted return for an abnormal accrual decile is the result of matching the original average returns on the decile and its new average return calculated using the new corresponding market-size returns. And so, returns on 920 different size-control portfolios have been estimated to adjust the same sample deciles' original returns.

[7] Note that the only exception is decile 1 in sample (A) that plays contradictory trend moving from the equally-weighted market-adjusted returns of -15% to the value-weighted of +2%. However, because of (i) the relatively low number of observations in sample's (A) deciles, in addition to (ii) some of these observations are of extreme values as appears in figure 6.1, such unexpected behaviour for returns can be expected. A closer look at decile number 1 in sample (A) revealed that the years 1983, 1984, and 1985 contained mergers for a very extremely large firms in that decile. Under the value-weighted method such firms will be reinvested on the remaining firms in the decile according to their values. As a matter of fact, most of the reinvested wealth in the three years, and mainly 1984, went to a very successful small firms leading to observing extraordinary high profits for decile 1.

Sample size-adjusted returns are estimated in two ways. First, equally-weighted size-control returns are used to adjust equally-weighted sample deciles' returns. Second, value-weighted size-control returns are used to adjust value-weighted sample deciles' returns.

Results of the equally- and value-weighted size-adjusted returns are combined together in one table for each sample. Panel (A) and (B) of each table contains results of the equally- and value-weighted size-adjusted returns respectively.

On the right hand-side for both panels the number of positive size-adjusted returns for each decile is recorded. The maximum possible occurrence of positive size-adjusted returns for all samples including (A+B). and (C+D) is 23.

We start with the equally-weighted size-adjusted returns.

6.3.2.1 Equally-Weighted Size-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (A) of tables 6.7.1, 6.7.2, 6.7.3, 6.7.4, 6.7.5, and 6.7.6 show the equally-weighted size-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively.

Results of this test accumulated over three years as from portfolio formations show the following main features. (i) In general, abnormal accruals deciles 9 and 10 produce insignificant negative equally-weighted size-adjusted returns. (ii) Abnormal accruals deciles 1 and 2 tend to produce insignificant positive equally-weighted size-adjusted returns (exceptions are decile 1 in sample (A) produces -10% (t-stat. -1.6, Wilc. 0.068), decile 2 in sample (D) produces 19% (t-stat. 3.54, Wilc. 0.002), and in sample (C+D) produces 9% (t-stat 2.15, Wilc. 0.052). (iii) A few some middle deciles produce statistically significant positive equally-weighted size-adjusted returns, e.g., decile 8 in sample (B) produces significant abnormal returns of 14%, deciles 2, 5, and 7 in sample (D) produces 19%, 21%, and 12%. Also, decile 8 in sample (A+B) produces 12%, and finally, deciles 2, 7 and 8 in sample (C+D)

TABLE 6.7

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED FOR EACH SAMPLE AVERAGED FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, a share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively. Deciles' returns are adjusted using returns calculated on size-control (match) portfolios. Returns of a specific sample decile are adjusted by returns of specific size-control portfolio. At each sample decile's formation date all LSE shares are sorted according to their market values and assigned to ten market-size deciles. Monthly returns are calculated and averaged for each market-size decile. Sample shares' original monthly returns are replaced each by its corresponding market-size decile's return. Sample deciles' buy-and-hold returns are then recalculated to obtain the sample deciles' size-control returns. Size-adjusted returns for a sample decile are then estimated by matching the sample's original returns with their corresponding size-control returns. Sample size-adjusted returns are estimated in two ways. First, equally-weighted size-control portfolios are used to adjust equally-weighted sample deciles' returns. Second, value-weighted size-control portfolios are used to adjust value-weighted sample deciles' returns. All numbers presented are averages over the 23 test periods computed for corresponding sample-portfolios. Results are presented for 5 distinct periods: the first 12-Months, the second 12-Months, the third 12-Months, the first 24-months, and finally the whole 36 month-test period.

Tables 6.7.1, 6.7.2, 6.7.3, 6.7.4 present the above samples' size-adjusted returns, respectively. Results of samples (A+B), and (C+D) are also presented on the basis of combining their annual size-adjusted returns in tables 6.7.5, and 6.7.6.

The tables are prepared as follows:

The number of positive size-adjusted returns is recorded on the right hand-side of both panels (A) and (B). The highest possible positive occurrence is 23, i.e., number of test periods. The last line of both panels (A) and (B), shows the difference in size-adjusted returns between decile number 1 (i.e., the lowest abnormal accruals decile) and decile number 10 (i.e., the highest abnormal accruals decile). *For both the equally- and value-weighted tests, the estimated size-adjusted returns are presented accompanied with t-statistic (t-) and the non-parametric Wilcoxon Signed-Rank Test (W.t-), where:*

- *Shows significant negative-adjusted returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red this shows significant negative-adjusted returns at 1% two-tailed (critical t- is -2.8).*
- *Shows significant positive-excess returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue this shows significant positive-excess returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 6.7.1

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	**-0.06**	-1.84	0.09	**-0.02**	-0.39	0.47	**-0.01**	-0.45	0.90	**-0.08**	-1.54	0.08	**-0.10**	-1.60	0.07	8	9	14	7	7
DEC. 2	**0.02**	0.42	0.48	**-0.04**	-1.31	0.24	**0.02**	0.39	0.88	**-0.03**	-0.55	0.52	**0.01**	0.12	0.88	14	8	12	9	12
DEC. 3	**0.00**	0.03	1.00	**-0.02**	-0.75	0.76	**0.00**	0.16	0.69	**0.00**	-0.08	0.76	**0.06**	0.71	0.90	12	10	13	10	11
DEC. 4	**0.03**	1.00	0.22	**-0.01**	-0.27	0.72	**-0.03**	-0.97	0.24	**0.03**	0.50	0.88	**0.03**	0.32	0.95	13	9	10	10	10
DEC. 5	**0.02**	0.62	0.47	**0.01**	0.34	0.38	**-0.07**	-1.41	0.25	**0.06**	0.80	0.33	**0.00**	-0.03	0.72	14	14	9	14	8
DEC. 6	**0.05**	1.38	0.02	**-0.01**	-0.14	0.81	**0.00**	0.17	0.78	**0.05**	0.76	0.24	**0.12**	1.57	0.14	18	11	10	15	14
DEC. 7	**-0.02**	-0.74	0.47	**0.02**	0.49	0.54	**-0.01**	-0.34	0.78	**0.03**	0.46	0.52	**0.04**	0.59	0.67	11	12	11	14	12
DEC. 8	**-0.02**	-0.65	0.83	**-0.01**	-0.26	0.69	**0.05**	1.46	0.15	**-0.01**	-0.31	1.00	**0.10**	1.28	0.30	13	11	16	14	12
DEC. 9	**-0.03**	-0.83	0.65	**-0.03**	-0.81	0.56	**-0.04**	-1.31	0.15	**-0.06**	-1.12	0.21	**-0.10**	-1.75	0.09	12	10	8	9	7
DEC. 10	**-0.06**	-2.44	0.02	**0.01**	0.33	0.61	**-0.01**	-0.38	0.69	**-0.06**	-0.84	0.43	**-0.06**	-0.67	0.30	6	12	10	11	9
DEC(1-10)	**0.00**	-0.05	0.81	**-0.03**	-0.58	0.39	**0.00**	0.05	1.00	**-0.02**	-0.32	0.67	**-0.04**	-0.46	0.67	12	8	13	10	11

* Note: a figure of, say, S.A.R = -0.06 should be interpreted as Size-Adjusted Returns of -6% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	**-0.04**	-0.65	0.24	**-0.01**	-0.26	0.48	**0.04**	0.78	0.41	**-0.07**	-0.93	0.26	**-0.01**	-0.05	0.43	9	9	13	8	8
DEC. 2	**-0.04**	-0.75	0.27	**-0.04**	-1.08	0.41	**0.01**	0.16	0.86	**-0.08**	-0.97	0.19	**-0.07**	-0.45	0.08	9	10	12	7	7
DEC. 3	**-0.01**	-0.29	0.90	**0.10**	1.92	0.11	**-0.01**	-0.27	0.76	**0.12**	1.48	0.18	**0.14**	1.20	0.22	10	14	10	13	13
DEC. 4	**0.04**	0.96	0.48	**-0.06**	-1.51	0.18	**0.05**	0.85	0.93	**-0.02**	-0.38	0.50	**0.08**	0.73	0.86	14	8	10	8	9
DEC. 5	**0.03**	0.53	0.86	**0.03**	0.70	0.69	**-0.06**	-1.28	0.11	**0.08**	0.94	0.61	**0.09**	0.72	0.78	12	12	7	12	14
DEC. 6	**0.00**	-0.13	0.81	**0.04**	0.86	0.52	**-0.04**	-1.22	0.38	**0.00**	0.03	0.90	**-0.05**	-0.55	0.48	11	13	9	10	10
DEC. 7	**-0.07**	-1.72	0.04	**-0.02**	-0.76	0.47	**0.01**	0.27	0.58	**-0.12**	-2.66	0.01	**-0.15**	-1.83	0.10	7	9	12	5	8
DEC. 8	**-0.04**	-1.25	0.26	**-0.02**	-0.41	0.67	**0.05**	1.30	0.22	**-0.06**	-1.16	0.32	**0.04**	0.46	0.86	8	8	15	10	11
DEC. 9	**-0.01**	-0.28	0.86	**-0.04**	-0.85	0.32	**-0.04**	-0.89	0.50	**-0.07**	-1.27	0.29	**-0.13**	-1.85	0.17	10	9	11	10	10
DEC. 10	**-0.04**	-0.88	0.12	**-0.09**	-2.15	0.08	**-0.04**	-1.37	0.11	**-0.16**	-2.29	0.02	**-0.24**	-2.85	0.01	7	8	7	5	6
DEC(1-10)	**0.00**	0.03	0.98	**0.08**	1.12	0.35	**0.09**	1.49	0.14	**0.08**	0.71	0.47	**0.23**	1.24	0.17	12	14	13	12	16

* Note: a figure of, say, S.A.R = -0.04 should be interpreted as Size-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 6.7.2

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
																FIRST	SECOND	THIRD	FIRST	FIRST
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	12/M	12/M	12/M	24/M	36/M
DEC. 1	0.04	1.40	0.63	-0.01	-0.14	0.86	0.01	0.17	0.50	0.06	0.90	0.63	0.13	1.11	0.61	12	11	7	13	12
DEC. 2	0.03	0.89	0.45	0.02	0.90	0.93	0.02	0.60	0.67	0.06	1.21	0.47	0.10	1.54	0.22	14	12	12	11	15
DEC. 3	0.07	2.03	0.10	0.01	0.53	0.63	-0.02	-0.73	0.50	0.09	1.72	0.12	0.09	1.27	0.26	13	12	10	14	13
DEC. 4	0.02	0.86	0.69	0.03	1.17	0.18	-0.01	-0.50	0.50	0.08	1.54	0.20	0.09	1.44	0.19	13	16	9	14	14
DEC. 5	0.00	-0.04	1.00	0.03	1.30	0.24	0.04	1.58	0.13	0.05	1.03	0.41	0.12	1.84	0.11	12	14	15	13	15
DEC. 6	0.02	0.66	0.63	0.01	0.30	0.83	-0.01	-0.30	0.86	0.03	0.62	0.61	0.02	0.37	0.83	11	11	11	10	10
DEC. 7	0.01	0.50	0.63	0.02	0.88	0.74	0.03	1.24	0.22	0.04	1.00	0.47	0.11	1.64	0.14	12	12	15	14	14
DEC. 8	0.07	3.07	0.01	0.02	0.64	0.50	0.01	0.50	0.56	0.10	2.37	0.03	0.14	2.39	0.04	18	12	14	17	14
DEC. 9	-0.02	-0.69	0.50	0.02	0.90	0.47	0.03	0.98	0.45	0.02	0.40	0.95	0.04	0.73	0.47	10	12	12	10	14
DEC. 10	-0.04	-1.61	0.16	0.00	-0.10	0.67	-0.02	-0.78	0.41	-0.03	-0.80	0.52	-0.05	-0.99	0.39	11	13	12	9	11
DEC(1-10)	0.08	2.15	0.07	0.00	-0.05	0.61	0.03	0.58	0.72	0.09	1.34	0.35	0.18	1.37	0.36	13	9	13	11	13

* Note: a figure of, say, S.A.R = 0.04 should be interpreted as Size-Adjusted Returns of 4% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
																FIRST	SECOND	THIRD	FIRST	FIRST
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	12/M	12/M	12/M	24/M	36/M
DEC. 1	0.02	0.76	0.50	-0.10	-2.30	0.03	0.00	-0.08	0.76	-0.09	-1.50	0.09	-0.11	-1.27	0.16	14	6	12	8	10
DEC. 2	-0.01	-0.47	0.65	0.00	0.03	0.54	-0.02	-0.45	0.48	-0.02	-0.37	0.69	-0.05	-0.49	0.61	10	9	9	13	11
DEC. 3	-0.03	-1.01	0.78	0.02	0.87	0.38	-0.02	-0.64	0.65	-0.01	-0.27	0.93	-0.03	-0.60	0.78	12	13	9	11	12
DEC. 4	0.00	0.04	0.76	-0.03	-0.83	0.36	0.01	0.37	0.86	-0.01	-0.21	0.72	0.01	0.16	0.98	13	9	11	9	10
DEC. 5	-0.02	-0.78	0.52	0.01	0.46	0.83	0.03	1.13	0.26	-0.01	-0.14	1.00	0.04	0.50	0.39	11	13	15	12	13
DEC. 6	0.03	0.93	0.35	0.07	1.92	0.11	-0.06	-1.90	0.12	0.11	2.11	0.07	0.02	0.32	0.98	13	14	10	15	12
DEC. 7	0.01	0.69	0.47	0.02	0.67	0.88	0.06	1.84	0.15	0.03	0.76	0.67	0.12	1.86	0.11	15	11	13	10	14
DEC. 8	0.00	0.16	0.81	0.00	-0.06	0.83	-0.02	-0.85	0.48	0.01	0.12	0.86	0.00	-0.03	0.93	12	11	10	12	12
DEC. 9	-0.07	-2.44	0.03	-0.07	-2.07	0.04	-0.01	-0.15	0.76	-0.15	-3.02	0.01	-0.19	-2.74	0.01	5	7	11	6	7
DEC. 10	0.01	0.27	0.95	-0.06	-2.05	0.04	-0.04	-1.07	0.26	-0.05	-1.10	0.35	-0.12	-1.79	0.11	13	7	9	11	9
DEC(1-10)	0.01	0.35	0.78	-0.04	-0.79	0.33	0.04	0.65	0.41	-0.04	-0.54	0.58	0.01	0.08	0.95	11	9	14	10	10

* Note: a figure of, say, S.A.R = 0.02 should be interpreted as Size-Adjusted Returns of 2% calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 6.7.3

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
																FIRST	SECOND	THIRD	FIRST	FIRST
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	12/M	12/M	12/M	24/M	36/M
DEC. 1	-0.03	-1.42	0.14	-0.01	-0.24	0.48	0.02	0.50	0.93	-0.05	-1.12	0.14	-0.03	-0.42	0.35	8	8	11	7	8
DEC. 2	0.03	0.93	0.29	-0.05	-2.03	0.06	0.01	0.25	0.95	-0.02	-0.45	0.39	0.00	0.00	0.54	14	7	11	8	10
DEC. 3	0.00	0.10	1.00	0.00	0.00	0.93	0.02	0.61	0.61	0.01	0.34	0.67	0.06	1.23	0.26	11	13	12	12	14
DEC. 4	0.02	0.86	0.43	0.02	0.70	0.72	-0.01	-0.19	0.61	0.05	1.02	0.58	0.06	0.75	0.95	12	10	12	12	10
DEC. 5	0.01	0.48	0.76	0.01	0.39	0.83	-0.04	-0.99	0.22	0.03	0.46	0.65	0.02	0.16	0.74	12	11	9	12	9
DEC. 6	0.06	1.77	0.10	0.01	0.47	0.81	0.00	-0.07	0.86	0.07	1.58	0.15	0.09	1.45	0.19	13	12	13	14	15
DEC. 7	-0.02	-0.60	0.65	0.05	1.44	0.22	0.02	0.61	0.39	0.06	0.87	0.43	0.11	1.47	0.33	12	14	14	14	14
DEC. 8	0.01	0.25	0.72	0.03	1.28	0.15	0.01	0.30	0.67	0.05	1.29	0.15	0.08	1.48	0.14	11	17	13	14	15
DEC. 9	0.00	-0.12	0.86	-0.03	-1.01	0.36	-0.03	-1.13	0.21	-0.05	-0.98	0.12	-0.09	-1.31	0.19	10	9	9	8	8
DEC. 10	-0.06	-2.34	0.02	0.01	0.43	0.61	-0.03	-1.05	0.25	-0.06	-1.06	0.17	-0.10	-1.58	0.04	8	14	8	7	6
DEC(1-10)	0.02	0.74	0.54	-0.02	-0.42	0.58	0.05	1.22	0.38	0.01	0.09	0.98	0.07	0.81	0.41	13	10	14	11	14

* Note: a figure of, say, S.A.R = -0.03 should be interpreted as Size-Adjusted Returns of -3% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S.A.R				
																FIRST	SECOND	THIRD	FIRST	FIRST
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	12/M	12/M	12/M	24/M	36/M
DEC. 1	-0.06	-1.09	0.09	-0.06	-1.43	0.20	-0.01	-0.16	0.90	-0.12	-1.41	0.03	-0.21	-2.59	0.02	8	10	12	7	6
DEC. 2	-0.08	-1.76	0.14	0.03	0.68	0.74	0.00	-0.07	0.88	-0.07	-1.20	0.22	-0.06	-0.54	0.39	9	10	13	9	10
DEC. 3	0.02	0.72	0.33	0.06	1.57	0.12	-0.04	-0.93	0.11	0.12	1.91	0.07	0.15	1.14	0.58	15	14	6	17	14
DEC. 4	0.01	0.26	1.00	-0.05	-1.28	0.24	0.00	-0.06	0.93	-0.02	-0.41	0.61	-0.01	-0.15	0.45	10	8	13	9	10
DEC. 5	0.04	0.93	0.39	0.04	0.91	0.65	-0.03	-0.80	0.25	0.10	1.26	0.38	0.10	0.81	0.93	12	10	8	11	10
DEC. 6	0.02	0.47	0.41	-0.03	-1.13	0.19	0.01	0.33	1.00	-0.02	-0.38	0.76	-0.02	-0.19	0.76	16	7	11	10	10
DEC. 7	-0.06	-1.84	0.09	-0.02	-0.50	0.36	-0.02	-0.43	0.74	-0.09	-1.92	0.07	-0.15	-2.53	0.02	7	8	11	7	7
DEC. 8	-0.01	-0.38	0.43	0.00	-0.03	0.98	0.03	0.86	0.61	-0.02	-0.43	0.63	0.03	0.32	0.95	8	12	10	11	11
DEC. 9	0.02	0.57	0.50	-0.07	-1.71	0.10	0.00	-0.13	0.90	-0.06	-1.04	0.32	-0.08	-0.86	0.43	14	7	10	10	9
DEC. 10	-0.06	-1.47	0.18	-0.06	-1.14	0.25	-0.06	-1.67	0.09	-0.16	-2.72	0.01	-0.26	-3.54	0.00	9	10	10	6	5
DEC(1-10)	0.01	0.10	1.00	0.00	-0.02	0.93	0.05	0.88	0.47	0.03	0.28	0.90	0.05	0.38	0.61	12	10	11	11	13

* Note: a figure of, say, S.A.R = -0.06 should be interpreted as Size-Adjusted Returns of -6% calculated over the first 12 months as from portfolio formation.

SAMPLE (D):

TABLE 6.7.4

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-
DEC. 1	0.02	0.71	0.72	-0.02	-0.51	0.67	0.01	0.36	0.90	0.01	0.21	0.83	0.06	0.77	0.98
DEC. 2	0.09	3.51	0.00	0.03	1.50	0.19	0.01	0.41	0.67	0.13	4.80	0.00	0.19	3.54	0.00
DEC. 3	0.02	0.72	0.86	0.01	0.34	0.88	-0.01	-0.30	0.88	0.03	0.62	0.61	0.04	0.59	0.58
DEC. 4	0.03	1.18	0.38	0.02	0.94	0.32	-0.03	-1.04	0.45	0.07	1.54	0.18	0.08	1.16	0.30
DEC. 5	0.02	0.88	0.36	0.05	2.25	0.04	0.06	2.56	0.02	0.10	2.18	0.08	0.21	3.22	0.01
DEC. 6	0.02	0.63	0.69	0.03	1.31	0.24	0.00	-0.22	0.78	0.05	1.26	0.39	0.07	1.15	0.52
DEC. 7	0.02	0.87	0.27	0.02	0.83	0.65	0.04	1.64	0.07	0.05	1.35	0.30	0.12	1.99	0.12
DEC. 8	0.04	2.30	0.04	0.02	0.95	0.11	0.00	-0.11	0.93	0.08	2.27	0.02	0.09	1.83	0.07
DEC. 9	-0.01	-0.46	0.86	0.00	0.20	0.29	0.02	0.92	0.47	0.01	0.14	0.72	0.03	0.60	0.78
DEC. 10	-0.02	-1.15	0.39	0.00	0.22	0.81	-0.01	-0.24	0.83	-0.01	-0.48	0.47	0.01	0.18	1.00
DEC(1-10)	0.04	1.26	0.83	-0.02	-0.61	0.54	0.02	0.46	0.98	0.03	0.40	0.90	0.06	0.62	0.65

* Note: a figure of, say, S.A.R = 0.02 should be interpreted as Size-Adjusted Returns of 2% calculated over the first 12 months as from portfolio formation.

No. of (+) S.A.R

FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
12	10	10	12	9
20	13	12	19	18
10	12	10	11	13
14	13	12	14	12
14	14	16	16	17
11	14	11	13	11
15	14	18	13	13
15	17	11	16	17
13	16	11	13	12
8	11	11	9	11
10	10	11	10	13

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
DECILE	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-
DEC. 1	-0.02	-0.88	0.26	-0.05	-1.48	0.38	0.04	1.13	0.17	-0.09	-1.68	0.03	-0.05	-0.61	0.26
DEC. 2	0.01	0.17	0.74	0.01	0.28	0.88	-0.04	-1.20	0.17	0.01	0.16	0.93	-0.05	-0.75	0.38
DEC. 3	-0.04	-1.35	0.39	-0.03	-0.96	0.48	-0.03	-1.35	0.14	-0.08	-2.11	0.08	-0.13	-2.23	0.04
DEC. 4	0.01	0.47	0.98	-0.04	-1.24	0.26	0.00	-0.12	0.63	-0.02	-0.37	0.48	-0.01	-0.16	0.63
DEC. 5	-0.02	-0.79	0.50	0.03	1.17	0.22	0.02	0.99	0.21	0.01	0.24	0.74	0.04	0.57	0.36
DEC. 6	0.01	0.36	0.90	0.02	0.67	0.61	0.00	-0.06	0.98	0.03	0.69	0.58	0.04	0.56	0.67
DEC. 7	0.00	-0.26	0.81	0.03	1.20	0.33	0.03	1.00	0.50	0.03	0.77	0.69	0.07	1.32	0.19
DEC. 8	-0.01	-0.28	0.88	0.00	-0.13	0.83	-0.05	-1.66	0.04	-0.01	-0.31	0.63	-0.06	-1.01	0.24
DEC. 9	-0.07	-2.79	0.02	-0.08	-2.41	0.02	-0.03	-1.04	0.32	-0.16	-3.70	0.00	-0.24	-3.88	0.00
DEC. 10	0.01	0.47	0.93	-0.04	-1.74	0.10	-0.05	-1.05	0.39	-0.03	-0.67	0.41	-0.09	-1.45	0.20
DEC(1-10)	-0.04	-0.98	0.36	-0.01	-0.34	0.72	0.08	1.34	0.19	-0.06	-1.02	0.25	0.04	0.37	0.72

* Note: a figure of, say, S.A.R = -0.02 should be interpreted as Size-Adjusted Returns of -2% calculated over the first 12 months as from portfolio formation.

No. of (+) S.A.R

FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
10	11	15	8	11
12	10	10	11	9
11	11	7	7	9
10	10	15	9	9
11	14	15	14	13
12	14	14	13	13
11	12	14	11	12
11	10	7	10	10
8	5	9	6	4
12	9	10	10	11
10	9	15	8	13

SAMPLE (A+B):

TABLE 6.7.5

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS S.A.R*	t-	W.t-	SECOND 12 MONTHS S.A.R	t-	W.t-	THIRD 12 MONTHS S.A.R	t-	W.t-	FIRST 24 MONTHS S.A.R	t-	W.t-	FIRST 36 MONTHS S.A.R	t-	W.t-	No. of (+) S.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.36	0.39	-0.01	-0.38	0.49	0.00	-0.07	0.59	-0.01	-0.28	0.42	0.01	0.20	0.43	10	7	13	8	9
DEC. 2	0.02	0.92	0.28	-0.01	-0.41	0.49	0.02	0.66	0.70	0.01	0.35	0.98	0.06	1.12	0.32	12	8	13	12	14
DEC. 3	0.04	1.36	0.24	0.00	-0.10	0.95	-0.01	-0.44	0.80	0.04	1.14	0.39	0.08	1.39	0.28	15	10	12	15	16
DEC. 4	0.03	1.34	0.24	0.01	0.46	0.69	-0.02	-1.10	0.18	0.06	1.35	0.29	0.06	1.10	0.36	12	12	8	12	13
DEC. 5	0.01	0.49	0.57	0.02	1.03	0.13	-0.01	-0.45	0.93	0.06	1.25	0.18	0.06	0.99	0.48	11	12	10	13	11
DEC. 6	0.04	1.47	0.06	0.00	0.03	0.76	0.00	-0.13	0.82	0.04	0.99	0.20	0.07	1.44	0.23	15	12	11	11	12
DEC. 7	-0.01	-0.27	0.84	0.02	0.92	0.47	0.01	0.52	0.55	0.04	0.96	0.32	0.08	1.56	0.18	9	13	12	14	13
DEC. 8	0.02	1.07	0.09	0.01	0.24	0.81	0.03	1.44	0.16	0.04	1.36	0.14	0.12	2.48	0.04	12	11	14	14	15
DEC. 9	-0.02	-1.09	0.45	0.00	-0.09	0.97	0.00	-0.18	0.73	-0.02	-0.49	0.34	-0.03	-0.67	0.46	11	10	13	9	10
DEC. 10	-0.05	-2.89	0.01	0.00	0.19	0.49	-0.02	-0.79	0.37	-0.04	-1.15	0.31	-0.05	-1.08	0.16	8	13	9	10	7
DEC(1-10)	0.04	1.42	0.14	-0.02	-0.48	0.34	0.02	0.49	0.73	0.03	0.66	0.76	0.07	0.82	0.63	15	10	10	11	13

* Note: a figure of, say, S.A.R = -0.01 should be interpreted as Size-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS S.A.R*	t-	W.t-	SECOND 12 MONTHS S.A.R	t-	W.t-	THIRD 12 MONTHS S.A.R	t-	W.t-	FIRST 24 MONTHS S.A.R	t-	W.t-	FIRST 36 MONTHS S.A.R	t-	W.t-	No. of (+) S.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.19	0.60	-0.06	-1.59	0.04	0.02	0.56	0.56	-0.08	-1.68	0.05	-0.06	-0.70	0.09	10	5	11	6	8
DEC. 2	-0.03	-0.89	0.25	-0.02	-0.88	0.43	0.00	-0.12	0.85	-0.05	-1.03	0.16	-0.06	-0.64	0.11	11	10	10	9	8
DEC. 3	-0.02	-0.85	0.63	0.06	2.09	0.07	-0.02	-0.61	0.48	0.05	1.21	0.37	0.05	0.80	0.49	12	14	9	15	13
DEC. 4	0.02	0.73	0.46	-0.04	-1.72	0.11	0.03	0.92	0.98	-0.02	-0.41	0.47	0.05	0.68	0.87	13	7	9	7	11
DEC. 5	0.00	0.07	0.71	0.02	0.85	0.72	-0.01	-0.47	0.71	0.04	0.73	0.72	0.07	0.89	0.43	10	11	9	11	12
DEC. 6	0.01	0.45	0.66	0.06	1.87	0.13	-0.05	-2.25	0.07	0.06	1.26	0.21	-0.01	-0.27	0.63	12	15	7	16	12
DEC. 7	-0.03	-1.29	0.17	0.00	-0.04	0.69	0.04	1.20	0.18	-0.05	-1.41	0.07	-0.01	-0.24	0.90	10	8	16	10	9
DEC. 8	-0.02	-0.87	0.57	-0.01	-0.37	0.81	0.02	0.73	0.58	-0.03	-0.78	0.53	0.02	0.36	0.99	10	10	11	8	10
DEC. 9	-0.04	-1.62	0.12	-0.05	-1.87	0.04	-0.02	-0.77	0.51	-0.11	-2.96	0.01	-0.16	-3.26	0.00	8	9	12	6	6
DEC. 10	-0.01	-0.54	0.29	-0.08	-2.97	0.01	-0.04	-1.70	0.06	-0.11	-2.48	0.02	-0.18	-3.33	0.00	8	8	9	5	4
DEC(1-10)	0.01	0.20	0.83	0.02	0.49	0.92	0.06	1.52	0.10	0.02	0.35	0.89	0.12	1.12	0.36	12	13	15	13	13

* Note: a figure of, say, S.A.R = -0.01 should be interpreted as Size-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D):

TABLE 6.7.6

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED SIZE-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Size-Adjusted Returns (S.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-
DEC. 1	-0.01	-0.50	0.45	-0.01	-0.54	0.43	0.01	0.62	0.88	-0.02	-0.53	0.25	0.02	0.33	0.55
DEC. 2	0.06	2.89	0.00	-0.01	-0.48	0.67	0.01	0.44	0.63	0.06	2.19	0.05	0.09	2.15	0.05
DEC. 3	0.01	0.58	0.87	0.00	0.26	0.88	0.01	0.25	0.80	0.02	0.71	0.60	0.05	1.22	0.23
DEC. 4	0.02	1.46	0.21	0.02	1.16	0.34	-0.02	-0.77	0.37	0.06	1.81	0.16	0.07	1.34	0.37
DEC. 5	0.02	0.95	0.40	0.03	1.61	0.13	0.01	0.43	0.63	0.06	1.73	0.12	0.11	1.83	0.12
DEC. 6	0.04	1.76	0.15	0.02	1.27	0.27	0.00	-0.21	0.92	0.06	2.04	0.10	0.08	1.86	0.15
DEC. 7	0.00	0.03	0.76	0.04	1.66	0.24	0.03	1.56	0.08	0.06	1.47	0.19	0.12	2.41	0.04
DEC. 8	0.02	1.64	0.09	0.03	1.60	0.03	0.00	0.15	0.76	0.07	2.50	0.01	0.09	2.35	0.02
DEC. 9	-0.01	-0.39	0.73	-0.01	-0.76	0.83	-0.01	-0.34	0.54	-0.02	-0.68	0.32	-0.03	-0.64	0.42
DEC. 10	-0.04	-2.52	0.02	0.01	0.48	0.63	-0.02	-0.95	0.32	-0.04	-1.16	0.12	-0.04	-1.11	0.12
DEC(1-10)	0.03	1.43	0.55	-0.02	-0.71	0.38	0.03	1.19	0.50	0.02	0.34	0.94	0.06	1.02	0.37

* Note: a figure of, say, S.A.R = -0.01 should be interpreted as Size-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

No. of (+) S.A.R

DECILE	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	9	9	12	9	10
DEC. 2	18	10	12	14	16
DEC. 3	14	13	13	13	14
DEC. 4	13	14	12	14	13
DEC. 5	13	14	10	15	14
DEC. 6	13	12	9	12	13
DEC. 7	11	14	13	13	17
DEC. 8	15	15	12	17	15
DEC. 9	11	12	9	9	10
DEC. 10	9	13	11	8	8
DEC(1-10)	12	10	13	12	12

Panel (B): Deciles' estimated Size-Adjusted Returns (S.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS		
	S.A.R*	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-	S.A.R	t-	W.t-
DEC. 1	-0.04	-1.37	0.04	-0.06	-2.07	0.09	0.01	0.48	0.49	-0.11	-2.10	0.00	-0.13	-2.23	0.01
DEC. 2	-0.04	-1.33	0.33	0.02	0.72	0.81	-0.02	-0.78	0.45	-0.03	-0.84	0.30	-0.06	-0.88	0.24
DEC. 3	-0.01	-0.49	0.96	0.02	0.67	0.53	-0.03	-1.48	0.02	0.02	0.50	0.81	0.01	0.16	0.40
DEC. 4	0.01	0.51	0.93	-0.04	-1.78	0.12	0.00	-0.12	0.75	-0.02	-0.56	0.41	-0.01	-0.22	0.42
DEC. 5	0.01	0.28	0.80	0.03	1.41	0.36	-0.01	-0.32	0.86	0.06	1.18	0.35	0.07	0.99	0.60
DEC. 6	0.02	0.60	0.49	-0.01	-0.34	0.65	0.00	0.24	0.94	0.00	0.13	0.82	0.01	0.23	1.00
DEC. 7	-0.03	-1.69	0.14	0.01	0.30	0.97	0.01	0.22	0.86	-0.03	-0.82	0.29	-0.04	-0.89	0.47
DEC. 8	-0.01	-0.48	0.60	0.00	-0.10	0.82	-0.01	-0.33	0.34	-0.02	-0.54	0.47	-0.02	-0.38	0.45
DEC. 9	-0.02	-1.07	0.33	-0.08	-2.89	0.01	-0.02	-0.78	0.63	-0.11	-3.04	0.01	-0.16	-2.91	0.01
DEC. 10	-0.03	-0.96	0.34	-0.05	-1.78	0.05	-0.05	-1.88	0.08	-0.09	-2.53	0.02	-0.17	-3.56	0.00
DEC(1-10)	-0.01	-0.38	0.59	-0.01	-0.18	0.90	0.06	1.61	0.14	-0.01	-0.19	0.55	0.04	0.53	0.56

* Note: a figure of, say, S.A.R = -0.04 should be interpreted as Size-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

No. of (+) S.A.R

DECILE	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	6	8	11	6	8
DEC. 2	7	14	10	10	11
DEC. 3	12	15	6	12	9
DEC. 4	12	8	12	9	12
DEC. 5	11	13	8	13	13
DEC. 6	12	11	10	10	13
DEC. 7	10	9	13	9	12
DEC. 8	9	13	8	8	9
DEC. 9	10	3	11	6	6
DEC. 10	6	8	10	4	4
DEC(1-10)	12	12	12	13	14

produce 9%, 12%, and 9% respectively. All returns are accumulated over 36 months.

And so, the results of the tests reject the alternative hypothesis that the highest/lowest abnormal accruals deciles produce adjusted returns less/more than zero, respectively.

The results of investing in the arbitrage portfolio under the equally-weighted size-adjusted method are similar to those under the equally-weighted market-adjusted method except for sample (A). *[Sample (A) produces insignificant size-adjusted returns of -0.04 over three years]*. Most of the samples produce insignificant positive abnormal returns with the highest of positive 0.18 (t-stat. 1.37, Wilc. 0.362) for sample (B) [8]. Accordingly, the third hypothesis is also accepted, that is; the arbitrage portfolio is statistically found to be unprofitable using the equally-weighted size-adjusting method.

For purpose of comparability, averages of equally-weighted size-adjusted returns –(for three distinct years following portfolio formations)- for a study by Sloan (1996) and another by Xie (2001) are as follows[9]:

	Sloan (1996). Average of 30 annual size-adjusted (matched) returns. 1962-1991.			**Xie (2001).** Average of 22 annual size-adjusted (matched) returns. 1971-1992.			**This study. Sample (C+D)** Average of 23 annual size- adjusted (matched) returns. 1979-2005.		
Decile No.	**year t+1**	**year t+2**	**year t+3**	**year t+1**	**year t+2**	**year t+3**	**year t+1**	**year t+2**	**year t+3**
Lowest 1	0.049 (2.65)	0.016 (1.17)	0.007 (0.55)	0.049 (2.82)	0.041(2.32)	0.024 (2.05)	-0.008 (-0.50)	-0.014(-0.54)	0.015 (0.62)
2	0.028 (3.60)	0.019 (1.65)	0.006 (0.68)	0.055 (5.32)	0.040 (3.14)	0.027 (2.87)	0.060 (2.89)	0.008 (-0.48)	0.009 (0.44)
9	-0.035 (-3.70)	-0.018 (-2.52)	-0.015 (-1.60)	-0.011 (-1.46)	0.004 (0.45)	0.009 (0.78)	-0.007 (-0.39)	-0.013 (-0.76)	-0.006 (-0.34)
Highest 10	-0.055 (-3.98)	-0.032 (-2.25)	0.022 (-1.61)	-0.061 (-4.86)	-0.033 (-3.05)	0.005 (0.36)	-0.040 (-2.52)	0.008 (0.48)	-0.019 (-0.95)
Hedge portfolio	0.104 (4.71)	0.048 (3.15)	0.029 (1.64)	0.11 (8.43)	0.074 (5.78)	0.019 (1.58)	0.032 (1.43)	-0.023 (-0.71)	0.033 (1.19)

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[8] It is noticed that some high averages of abnormal returns are not statistically significant due to the high annual returns variations.

[9] However, comparability with these two papers is incomplete. Sloan's (1996) work is based on total accruals and not abnormal accruals. On the other hand, Xie's (2001) analysis is based on abnormal accruals deciles obtained using cross-sectional Jones model and not the time-series MJM as in this study.

If to ignore differences in test specifications between this study and each of Sloan's (1996) and Xie's (2001), footnote 9 on previous page, then based on these size-adjusted returns, we observe that while both of the lowest and highest accruals (abnormal accruals) deciles significantly contribute to excess returns earned by the hedge portfolio formed by Sloan (Xie), returns on the hedge portfolio in this study are weaker than those of the comparable two studies (undifferentiated from zero over the first, second, and third year as from portfolio formations), and are mainly driven by the highest abnormal accruals decile.

In the following analysis we investigate possible reasons for the occurrence of more positives than negatives for the equally-weighted size-adjusted test. We start by recalling that the opposite (more negatives than positives) was found in the equally-weighted market-adjusted results considered in sections 6.3.1.1 and 6.3.1.3, and then, the higher frequencies of negative equally-weighted market-adjusted returns were attributed to the fact that companies in the samples are of larger sizes (with lower returns) than those of the market.

If shares in the market are of higher equally-weighted returns than shares in the samples as a result of including smaller firms, one would guess that by replacing the sample shares' original returns by returns calculated on corresponding market-size deciles, as in the size-adjusting test, more negative than positive size-adjusted returns can be anticipated.

However, the more positive abnormal returns in the equally-weighted size-adjusting test, is the product of replacing the samples' original share returns by, on average, lower returns. But, why should lower returns be anticipated to replace the sample shares' original returns?

In addition to share returns, share deletions are of considerable importance in identifying the performance on a share portfolio. Table 6.8.1 shows percentages of share deletions for each of the four samples (A, B, C, and D) and their market-indices. In this table, percentages of share deletions are categorised into two parts: (1) when deletions are without value (valueless

TABLE 6.8

SAMPLES' AND RELATED MARKET-INDICES' TOTAL NUMBERS OF FIRM-YEARS, PERCENTAGES OF FIRM-DELETIONS, AND THE ESTIMATED BUY-AND-HOLD RETURNS

(DELETION PERCENTAGES ARE ACCUMULATED OVER THREE PERIODS (FIRST 12/ FIRST 24/ AND FIRST 36 MONTHS) AS FROM FORMATION DATES AND DRAWN ON ALL 23 FORMATIONS. ALSO, THE EFFECT OF THESE DELETIONS ON THE SAMPLES' AND RELATED MARKETS INDICES' BUY-AND-HOLD RETURNS ARE CALCULATED.

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half/ and the second half* of the year, respectively. Each sample is tested over 23 formation periods. When samples' abnormal returns are estimated using market-adjusting method, returns of a specific sample are adjusted by returns of a specific market portfolio to avoid *new listing bias. Therefore,* 92 different market portfolios -(23 test periods times 4 samples)- have been constructed to match the 92 different sample formation dates included in this study. To distinguish among samples' market portfolios in this table, they are related to the sample itself.

Two main tables are included. In table 6.8.1, percentages of deletions (both with and without value) are presented for the samples' and their related market indices. Note: a percentage is equal to number of deletions divided by number of firm-years. Percentages are accumulated over the first 12, 24, and 36 months for each formation, and drawn on all 23 formation periods. In the 6.8.2, the effect of deletions on returns is considered. Buy-and-hold returns are calculated for the two main samples in this study [i.e., samples (A), and (B)] and their related market indices. Shares included in these two samples and their market indices at any formation date are classified into categories: **1)** Deletions with value. These are shares delisted during any of the 36 months within a test period for reasons accompanied with value (e.g., mergers). **2)** All shares minus just deletions with value (i.e., minus shares in (1)). **3)** All shares minus all deletions (i.e., minus deleted shares with and without value). This includes all alive shares over the whole 36 months included in a test period. **4)** All shares without any exclusion. (i.e., as was presented in table 6.5). Note that categories (1) and (2) are equal to category (4). More importantly, the effect of deletions on the overall portfolio returns can be anticipated through comparing differences among the different categories. Such a comparison is facilitated by noting returns on deletions with value (category (1)), and on deletions without value (through combining categories (2) and (3)).

Buy-and-hold returns for this test has been estimated over the first 12 months in a test period and averaged for all 23 portfolio formations. Calculating returns over 12 months (rather than 24 or 36) is to sustain reasonable numbers of observations within the first share category (i.e., (1)).

TABLE 6.8.1

SAMPLES' AND RELATED MARKET-INDICES' TOTAL NUMBERS OF FIRM-YEARS, AND PERCENTAGES OF FIRM-DELETIONS.

DELETION PERCENTAGES ARE ACCUMULATED OVER THREE PERIODS (FIRST 12/ FIRST 24/ AND FIRST 36 MONTHS) AS FROM FORMATION DATES AND DRAWN ON ALL 23 FORMATIONS.

TYPES OF PORTFOLIOS	TOTAL NUMBER OF FIRM-YEARS INCLUDED IN EACH OF THE TWO TYPES OF PORTFOLIOS IN RELATION WITH SAMPLES:				Accumulated over	PERCENTAGES OF DELETIONS WHEN VALUELESS IN RELATION WITH SAMPLES:				PERCENTAGES OF DELETIONS WHEN WITH VALUE IN RELATION WITH SAMPLES:			
	sample A	sample B	sample C	sample D		sample A	sample B	sample C	sample D	sample A	sample B	sample C	sample D
SAMPLE TYPE	3330	4578	4492	6079	12 MONTHS	0.9%	0.9%	0.8%	0.9%	6.2%	5.5%	5.7%	5.4%
					24 MONTHS	2.0%	2.1%	1.9%	1.9%	12.9%	11.9%	12.4%	12.0%
					36 MONTHS	2.9%	3.2%	3.0%	2.9%	19.1%	18.1%	18.8%	18.2%
RELATED MARKET-INDEX*	38818	38992	39021	38993	12 MONTHS	0.9%	1.0%	1.0%	1.0%	4.2%	4.0%	4.0%	4.0%
					24 MONTHS	2.1%	2.2%	2.1%	2.2%	9.1%	9.0%	9.0%	9.0%
					36 MONTHS	3.1%	3.2%	3.2%	3.2%	13.8%	13.8%	13.7%	13.8%

* A sample-related market-indices consists from all shares in the market with available return data as at the sample formation dates.

Note that percentages of, say, 0.9% and 6.2% should be interpreted as 0.9% and 6.2% of the 3330 shares included in sample (A) deleted during the first year within the 23 test periods for reasons accompanied without (e.g., liquidation) and with value (e.g., merger), respectively.

TABLE 6.8.2

BUY-AND-HOLD RETURNS FOR DIFFERENT SHARE CATEGORIES WITHIN THE TWO MAIN SAMPLES [I.E., SAMPLES (A), and (B)] AND RELATED MARKET INDICES. *(DIFFERENT SHARE CATEGORIES INCLUDE DEAD AND ALIVE SHARES. DEAD SHARES INCLUDE DELETIONS WITH AND WITHOUT VALUES. BUY-AND-HOLD RETURNS ARE CALCULATED USING BOTH THE EQUALLY- AND VALUE-WEIGHTED METHODS FOR THE FIRST 12 MONTHS AS FROM FORMATION AND AVERAGED OVER ALL 23 FORMATION PERIODS).*

TYPE OF SHARES BASED ON WHICH BUY-AND-HOLD RETURNS ARE CALCULATED	BUY-AND-HOLD AVERAGE RETURNS FOR FIRST 12 MONTHS AS FROM PORTFOLIO FORMATION DATE FOR SAMPLE TYPE				BUY-AND-HOLD AVERAGE RETURNS FOR FIRST 12 MONTHS AS FROM PORTFOLIO FORMATION DATE FOR RELATED MARKET-INDEX TYPE *			
	EQ. WEIGHTED		V. WEIGHTED		EQ. WEIGHTED		V. WEIGHTED	
	sample A	sample B	sample A	sample B	sample A	sample B	sample A	sample B
RETURNS ARE BASED ONLY ON DELETED FIRMS WITH VALUE *(e.g., mergers are included)*	28.7%	31.6%	21.2%	21.7%	28.2%	26.9%	21.9%	19.7%
RETURNS ARE BASED ON ALL FIRMS MINUS JUST DELETED FIRMS WITH VALUE *(e.g., mergers are excluded)*	16.0%	15.9%	11.3%	13.4%	19.3%	18.2%	15.4%	14.7%
RETURNS ARE BASED ON ALL FIRMS MINUS ALL DELETIONS *(with and without value are excluded)*	18.1%	18.3%	11.5%	13.8%	21.6%	20.7%	15.6%	14.9%
RETURNS ARE BASED ON ALL FIRMS *(e.g., mergers and liquidations are included)*	18.0%	18.3%	12.0%	14.1%	20.2%	19.1%	15.8%	15.0%

Note that a figure of, say, 28.7% should be interpreted as average buy-and-hold returns of 28.7% per year earned by deleted shares -(over 3 years)- when deletions are with value, e.g., mergers.

deletions such as liquidation) and (2) when deletions are with value (e.g., mergers). Share deletion percentages are computed on the basis of the number of firm-years outstanding at the time of portfolio creation and accumulated over three different periods (first 12/ second 24/ and third 36 months) and drawn on all 23 portfolio formations.

Results of this test show that the samples can not be distinguished from their market-indices regarding the valueless deletions accumulated over three years. These percentages are (2.9%, 3.2%, 3%, and 2.9%) v.s. (3.1%, 3.2%, 3.2% and 3.2%) for the samples and their related market-indices, respectively. If valueless deletions in the market are significantly higher than those of the samples, this in part, can help us understand why the equally-weighted test produces more positive than negative size-adjusted returns; since more specifically, the samples' original returns will be replaced with lower returns from the market-size deciles. As a matter of fact, we checked this possibility even though results in table 6.5 showed higher equally-weighted returns on the market compared with those on the samples, the factor that does not support the proposal that valueless deletions can explain the observed high occurrence of positive equally-weighted size-adjusted returns.

On the other hand, when deletions with value (henceforth, deletions$^{\text{with value}}$) are considered, significant differences between the samples and the market have been found. Accumulated over three years, the percentages are (19.1%, 18.1%, 18.8%, and 18.2%) v.s. (13.8%, 13.8%, 13.7% and 13.8%) for the samples (A, B, C, and D) and their related market-indices, respectively. These figures indicate that the samples include higher percentages of deletions$^{\text{with value}}$ of 38.5% (= 19.1/13.8 - 1), 30.9%, 37.3% and 32% than their corresponding market-indices, respectively.

If deleted firms for reasons such as mergers and acquisitions experience on average an exceptional high returns for a period of time before their final deletion (as it can be expected) then the observed high frequencies of positive equally-weighted size-adjusted returns can be explained, as it would not be expected to sustain the original high levels of returns for such high percentages of deletions when returns are replaced. If this to be the case, then the effect of deletions$^{with\ value}$ in one direction (i.e., pushing up the equally-weighed size-adjusted returns) is stronger than the effect of firm-size in the other direction.

To assess the effect of share deletions (both when deletions are with and without value) on their portfolios' returns, we calculate returns on *four* groups of shares for two samples (A, and B) and their market-indices. Shares for each group are defined differently to facilitate recognising the effect of share deletions on portfolio returns. Share definitions (i.e., groups) are:

1- According to the first definition, samples' and their market indices' returns are based only on deleted shares with value. Deletions$^{with\ value}$ are considered regardless the month of deletion (i.e., deletions can take place within any of the 36-month test periods).

2- In the second, samples' and their market indices' returns are based only on all shares minus deletions$^{with\ value}$. Deletions$^{with\ value}$ are considered regardless the month of deletion within the 36-month test periods.

3- The samples' and their market indices' returns are based only on all shares minus all deletions (i.e., deletions with and without value are discarded). Deletions are considered regardless the month of deletion within the 36-month test periods.

4- The samples' and their market indices' returns are based on all shares.

Table 6.8.2 shows the estimated buy-and-hold returns for the four different groups (definitions) of shares for both the samples and their market-indices. Returns are estimated using the equally- and value-weighted methods. Returns are estimated for just one period; 12 months as from portfolio formations and drawn on all 23 formations [10].

Deletions$^{with\ value}$ (the first line in the table) are found to have returns as high as twice those of all shares minus the same deletions (line 2 in the table) for the samples, and the difference is remarkably strong for both the equally- and value-weighted methods. In numbers, deletions$^{with\ value}$ for samples (A, and B) earn equally-weighted raw returns of (28.7% and 31.6%) and value-weighted raw returns of (21.2% and 21.7%), compared with returns of (16% and 15.9%) equally-weighted and (11.3% and 13.4%) value-weighted on all the shares minus the same deletions for the two samples, respectively.

To quantify the influence of the deletions$^{with\ value}$ on the overall performance of all the shares we compare the second line with the fourth line as the difference is absolutely related to the deletions$^{with\ value}$. These deletions effect on samples (A, and B) is (2%, and 2.4%) equally-weighted and (0.7%, and 0.7%) value-weighted, respectively. It is very important to note that the effect of deletions$^{with\ value}$ on the overall performance of all shares is very small using the value- compared with the equally-weighed method and this possibly due to the return calculation process under the value-weighted basis that requires reinvesting such deleted companies on remaining shares based on remaining companies' values, and therefore larger remaining shares with low expected performances will receive more. If it is the case then the high performance achieved by the deletions$^{with\ value}$ for some period before they cease to continue, will be revert by the very huge firms with generally lower returns.

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[10] Results are estimated just for the first 12 months as from portfolio formations to ensure testing the majority of deleted firms, as more deletions are expected in year two and deletions are essentially complete by the third year.

Table 6.8.2 also shows that the effect of deletions$^{with\ value}$ is less pronounced on the market-indices than the effect on the samples since the percentages of these deletions are less within the market compared with within the samples as was reported in table 6.8.1.

On the other hand, the effect of valueless deleted companies (e.g., liquidated firms) on the overall performance of all shares is apparently equal between the two samples and their market-indices as was anticipated. This effect can be evaluated through comparing the second line in table 6.8.2 that represent returns on all shares minus deletions$^{with\ value}$ and the third line that represents returns on all shares minus all deletions.

Finally, we investigate if there is relationship between numbers of deletions$^{with\ value}$ (e.g., mergers and acquisitions) and the firm-size as our samples are of larger sizes than the market. As at portfolio formations, shares within each of the four market-indices (one for each sample) are sorted according to their market value from the lowest to the highest and assigned to 10 market-size deciles. Market-size decile 1 contains the smallest 10% of firms, and so on. Numbers of deleted companies within each decile are counted both when deletion is with or without value to identify if there is any systematic relationship between firm-size and numbers of deletions. Numbers of deletions are accumulated for each decile over all 23 formation periods. Table 6.9 shows two unique patterns: the first includes an inverse relationship between numbers of valueless deletions (e.g., liquidations) and firm-size, panel (A). And the second shows inverted "U" relationship between number of deletions$^{with\ value}$ (e.g., mergers) and firm-size, that is, the highest frequencies of deletions are for the middle-sized firms, panel (B).

The results in panel (B) of table 6.9 do not provide evidence that the high percentages of deletions$^{with\ value}$ in the samples relate to firm-size since the effect of size on number of deletions in the samples is possibly offset by including fewer small but more huge firms (than the market) both found to have low deletions$^{with\ value}$.

TABLE 6.9

SAMPLES' (A, B, C, and D) RELATED MARKET-INDICES' NUMBERS OF FIRM DELETIONS FOR BOTH WHEN DELETIONS ARE WITH AND WITHOUT VALUE.

Firms in each sample's market-index are sorted according to their market values and assigned to ten deciles. Decile number 1 contains the smallest 10% of firms, and so on, till decile number 10 that contains the largest 10% of firms. Numbers of firm deletions are presented for the samples' related market indices' size-deciles. Numbers are accumulated over 3 years as from formation dates and drawn on all 23 portfolio formations. Numbers of share deletions when deletions are not accompanied with proceeds (i.e., valueless) are in panel (A). Numbers of share deletions when deletions are accompanied with proceeds are in panel (B).

RELATED MARKET-INDEX SIZE-DECILES	Panel (A) NUMBER OF FIRM DELETIONS WHEN VALUELESS ACCUMULATED OVER 3 YEARS					Panel (B) NUMBER OF FIRM DELETIONS WHEN WITH VALUE ACCUMULATED OVER 3 YEARS				
	sample A	sample B	sample C	sample D		sample A	sample B	sample C	sample D	
1	312*	324	317	325		327	324	337	325	
2	212	225	205	223		461	457	461	456	↓ +
3	166	172	187	174		534	556	569	554	
4	133	126	138	124		687	661	634	654	
5	128	133	122	134		690	675	679	681	
6	95	103	102	102		606	657	638	659	
7	76	76	74	77		584	572	587	575	
8	49	49	50	49		566	582	558	580	
9	31	27	26	27	↑ +	530	532	526	533	↑ +
10	15	17	17	17		377	364	363	363**	
Totals	905	1252	1238	1252		5362	5380	5352	5017	

* A figure of, say, 312 should be interpreted as 312 firms of all the firms in sample's (A) market-index size-decile number 1 were deleted without any value. This figure is accumulated over all 23 test periods.

** A figure of, say, 363 should be interpreted as 363 firms of all the firms in sample's (D) market-index size-decile number 10 were deleted with value. This figure is accumulated over all 23 test periods.

We conclude that the previously observed high negative frequencies of the equally-weighted market-adjusted returns for the sample deciles' do not contradict the high positive frequencies of the equally-weighted size-adjusted returns. The first relates to the fact that the market contains smaller firms than the samples, while the second relates to the fact that the samples contain higher percentages of deletions that have been evidenced to have significantly high returns. And so, we propose that by replacing the deleted shares' returns with returns from the market that contains smaller firms with relatively higher returns, the new returns are still short of the original high returns for these companies. However, we recognise that by replacing the original returns for the deletions$^{\text{with value}}$ by lower returns, the rest of the firms in the samples (i.e., all shares minus deletions$^{\text{with value}}$) are likely to be assigned with higher returns than their original returns under the size-adjusting test, which seems to be less than to offset the difference in returns on the deletions$^{\text{with value}}$ for most of the deciles, except for some of the extreme abnormal accruals deciles that contain disproportionately smaller firms compared with the rest of deciles, e.g., decile 1 in samples (A, and C), see figure 6.1.

Finally, the effect of deletions$^{\text{with value}}$ on a portfolio's average returns can be minimized using value-weighted basis.

6.3.2.2 Value-Weighted Size-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (B) of tables 6.7.1, 6.7.2, 6.7.3, 6.7.4, 6.7.5, and 6.7.6 presents the value-weighted size-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively.

Results of the value-weighted size-adjusted returns are very similar to those of the value-weighted market-adjusted returns.

Significant negative abnormal returns are observed for deciles 9 or/and 10 (i.e., the highest abnormal accruals deciles), e.g., deciles 9, and 10 for sample (A+B) produces value-weighted size-adjusted returns of -16% (t-stat. -3.26, Wilc. 0.005) and -18% (t-stat. -3.33, Wilc. 0.003), respectively, and deciles 9 and 10 of sample (C+D) produces value-weighted size-adjusted returns of -16% (t-stat. -2.91, Wilc. 0.008) and -17% (t-stat. -3.56, Wilc. 0.002), respectively.

And so, the value-weighted size-adjusting test statistically suggests accepting the first *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns.

On the other hand, under the value-weighted approach, deciles 1 and 2 produce insignificant negative size-adjusted returns except for deciles 1 in samples (C) and (C+D) where a negative abnormal returns of – 21% (t-stat. -2.59, Wilc. 0.019) and -13% (t-stat. -2.23, Wilc. 0.010) were obtained, respectively.

Similar to results of the value-weighted market-adjusting test, the second *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted under the value-weighted size-adjusted test.

In addition, the results of the arbitrage portfolio can be thought of as identical to those of previous tests. All arbitrage portfolios for all six samples produce insignificant positive value-weighted size-adjusted returns; the highest is 23% (t-stat. 1.24, Wilc. 0.171) for sample (A). Therefore, we accept the *hypothesis* that investing in the arbitrage portfolio produces value-weighted size-adjusted returns indistinguishable from zero.

6.3.3 Book-to-Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

In this test, sample decile returns are adjusted using returns calculated on book-to-market (B/M)-control (matching) portfolios. Returns of a specific sample decile are adjusted by returns of specific B/M-control portfolio described in chapter five. A specific B/M-control portfolio consists of the same shares in the sample portfolio but with different returns. The original return on a share within a sample portfolio in a specific test period is replaced by the average return on the share's corresponding market-B/M portfolio for the same test period. The B/M-adjusted return for an abnormal accrual decile is the result of matching the original average returns on the decile and its new average return calculated using the new corresponding B/M returns. Consequently, returns on 920 different sample B/M-control portfolios have been estimated to adjust the original returns on the 920 sample portfolios included in this study.

Sample B/M-adjusted returns are estimated in two ways. First, equally-weighted B/M-control returns are used to adjust equally-weighted sample deciles' returns. Second, value-weighted B/M-control returns are used to adjust value-weighted sample deciles' returns.

Panels (A) and (B) of each table contains results of the equally- and value-weighted B/M-adjusted returns, respectively.

Also, on the right hand side for both panels, number of positive B/M-adjusted returns for each decile is noted. The maximum possible occurrence of positive B/M-adjusted returns for all samples including (A+B), and (C+D) is 23.

6.3.3.1 The Equally-Weighted Book-to-Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (A) of tables 6.10.1, 6.10.2, 6.10.3, 6.10.4, 6.10.5, and 6.10.6 show the equally-weighted B/M-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively.

In general, abnormal accruals deciles 9 and 10 produce significant negative equally-weighted B/M-adjusted returns, e.g., decile 9 in samples (A+B) and (C+D) produce -12% (t-stat. -3.38, Wilc. 0.003) and -9% (t-stat. -2.46, Wilc. 0.011), respectively. Also, decile 10 for the same samples produces -8% (t-stat. -1.65, Wilc. 0.035) and -9% (t-stat. -2.09, Wilc. 0.021), respectively. All returns are calculated for 36 months. Therefore, the equally-weighted B/M-adjusting test statistically accepts the first *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns.

Abnormal accruals deciles 1 and 2 produce insignificant negative and sometimes positive equally-weighted B/M-adjusted returns. Consequently, under the equally-weighted B/M-adjusted test, the *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted.

The arbitrage portfolio, as in the market- and size-adjusting tests, produce insignificant positive B/M-adjusted returns, with the highest abnormal returns for sample (B) of 17% (t-stat. 1.32, Wilc. 0.362). Leading to the acceptance of the third hypothesis, that is; the arbitrage portfolio is found statistically to be unprofitable using the equally-weighted B/M-adjusting basis.

6.3.3.2 The Value-Weighted Book-to-Market-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Panel (B) of tables 6.10.1, 6.10.2, 6.10.3, 6.10.4, 6.10.5, and 6.10.6 present the value-weighted B/M-adjusted performance for samples (A), (B), (C), (D), (A+B), and (C+D), respectively.

The results of this test confirm the results for both the market- and size-adjusting tests using the value-weighted method.

Significant negative abnormal returns are observed for deciles 9 or/and 10 (i.e., the highest abnormal accruals deciles), e.g., deciles 9, and 10 for sample (A+B) produces value-weighted B/M-adjusted returns of -17% (t-stat. -3.95, Wilc. 0.001) and -14% (t-stat. -2.91, Wilc. 0.006),

TABLE 6.10

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED BOOK-TO-MARKET (B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED FOR EACH SAMPLE AVERAGED FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, a share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively. Deciles' returns are adjusted using returns calculated on book-to-market (B/M)-control portfolios. Returns of a specific sample decile are adjusted by returns of specific B/M-control portfolio. At each sample decile's formation date all shares included in the four samples (A, B, C, and D) are pooled and sorted according to their B/M values and assigned to 25 pooled B/M portfolio. Monthly returns are calculated and averaged for each pooled B/M portfolio. Sample shares' original monthly returns are replaced each by its corresponding pooled B/M portfolio return. Sample deciles' buy-and-hold returns are then recalculated to obtain the sample deciles' B/M control returns. B/M-adjusted returns for a sample decile are then estimated by matching the sample's original returns with their corresponding B/M-control returns. Sample B/M-adjusted returns are estimated in two ways. First, equally-weighted B/M-control portfolios are used to adjust equally-weighted sample deciles' returns. Second, value-weighted B/M-control portfolios are used to adjust value-weighted sample deciles' returns. All numbers presented are averages over the 23 test periods computed for corresponding sample-portfolios. Results are presented for 5 distinct periods: the first 12-Months, the second 12-Months, the third 12-Months, the first 24-months, and finally the whole 36 month-test period. Tables 6.10.1, 6.10.2, 6.10.3 and 6.10.4 present the above samples' B/M-adjusted returns respectively. Results of samples (A+B), and (C+D) are also noted on the basis of combining their annual B/M-adjusted returns in tables 6.10.5, and 6.10.6.

The tables are prepared as follows:

The number of positive B/M-adjusted returns is recorded on the right hand-side of both panels (A) and (B). The highest possible positive occurrence is 23, i.e., number of test periods. The last line of both panels (A) and (B), shows the difference in B/M-adjusted returns between decile number 1 (i.e., the lowest abnormal accruals decile) and decile number 10 (i.e., the highest abnormal accruals decile). *For both the equally- and value-weighted tests, the estimated B/M-adjusted returns are presented accompanied with t-statistic (t-) and the non-parametric Wilcoxon Signed-Rank Test (W.t-), where:*

- *Shows significant negative-adjusted returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red this shows significant negative-adjusted returns at 1% two-tailed (critical t- is -2.8).*
- *Shows significant positive-excess returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue this shows significant positive-excess returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 6.10.1

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS: FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-	No. of (+) B/M.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	**-0.04**	-1.79	0.09	**0.00**	-0.12	0.22	**0.00**	-0.10	0.76	**-0.04**	-0.88	0.08	**-0.06**	-0.77	0.15	8	8	10	5	7
DEC. 2	**0.00**	0.10	0.83	**-0.04**	-1.56	0.13	**0.02**	0.34	0.95	**-0.05**	-0.87	0.27	**-0.04**	-0.59	0.41	11	8	11	7	9
DEC. 3	**-0.02**	-0.60	0.38	**-0.02**	-1.00	0.36	**0.01**	0.63	0.54	**-0.04**	-0.81	0.12	**0.02**	0.19	0.47	9	11	12	9	10
DEC. 4	**0.00**	0.12	0.56	**-0.02**	-0.47	0.56	**-0.06**	-1.63	0.14	**-0.01**	-0.11	0.86	**-0.07**	-0.80	0.39	12	10	8	11	8
DEC. 5	**0.01**	0.27	0.76	**0.00**	0.09	0.72	**-0.05**	-1.64	0.10	**0.03**	0.45	1.00	**-0.04**	-0.54	0.36	11	11	8	12	10
DEC. 6	**0.03**	1.35	0.15	**-0.04**	-1.13	0.72	**-0.02**	-0.70	0.67	**-0.01**	-0.26	0.65	**-0.01**	-0.19	0.69	15	12	11	14	14
DEC. 7	**-0.03**	-1.08	0.16	**0.00**	-0.11	0.95	**-0.02**	-0.61	0.67	**-0.02**	-0.28	0.72	**-0.04**	-0.65	0.36	7	12	11	9	10
DEC. 8	**-0.02**	-0.69	0.35	**-0.02**	-0.84	0.36	**0.05**	1.48	0.15	**-0.02**	-0.50	0.39	**0.08**	1.03	0.39	9	10	15	12	14
DEC. 9	**-0.04**	-1.33	0.11	**-0.06**	-1.75	0.09	**-0.05**	-1.79	0.11	**-0.12**	-2.12	0.04	**-0.21**	-3.91	0.00	7	6	8	7	5
DEC. 10	**-0.06**	-2.52	0.03	**0.02**	0.46	0.72	**0.00**	-0.05	0.81	**-0.06**	-1.13	0.25	**-0.06**	-0.78	0.16	6	13	13	9	7
DEC(1-10)	**0.02**	0.44	0.35	**-0.02**	-0.42	0.54	**0.00**	-0.03	0.90	**0.02**	0.20	0.95	**0.00**	0.02	0.95	13	10	13	9	11

* Note: a figure of, say, B/M.A.R = -0.04 should be interpreted as B/M-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-	No. of (+) B/M.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	**0.02**	0.36	0.98	**0.01**	0.10	0.63	**0.03**	0.47	0.95	**0.01**	0.17	0.83	**0.08**	0.52	0.58	9	9	13	9	9
DEC. 2	**0.00**	-0.12	0.78	**-0.04**	-1.12	0.16	**0.03**	0.53	0.74	**-0.02**	-0.31	0.45	**0.03**	0.22	0.20	10	8	12	9	8
DEC. 3	**0.02**	0.64	0.65	**0.07**	2.20	0.04	**0.00**	-0.07	0.90	**0.11**	2.06	0.05	**0.14**	1.50	0.19	13	17	12	16	15
DEC. 4	**0.05**	1.23	0.16	**-0.01**	-0.19	0.95	**0.04**	1.07	0.58	**0.06**	0.90	0.36	**0.15**	1.55	0.25	14	13	13	14	13
DEC. 5	**0.04**	1.32	0.38	**0.04**	1.27	0.16	**-0.06**	-1.55	0.14	**0.11**	1.98	0.06	**0.09**	0.91	0.36	11	14	7	16	14
DEC. 6	**0.03**	1.23	0.21	**0.05**	1.11	0.29	**-0.02**	-0.75	0.33	**0.06**	1.19	0.20	**0.03**	0.47	0.67	14	13	10	14	13
DEC. 7	**-0.06**	-2.04	0.03	**-0.02**	-0.72	0.32	**-0.01**	-0.19	0.98	**-0.10**	-2.17	0.01	**-0.15**	-1.87	0.09	5	10	11	5	7
DEC. 8	**-0.03**	-0.89	0.56	**0.00**	0.17	0.74	**0.05**	1.47	0.25	**-0.02**	-0.33	0.61	**0.07**	0.85	0.88	11	12	15	11	11
DEC. 9	**-0.02**	-0.42	0.90	**-0.07**	-1.74	0.04	**-0.03**	-0.97	0.20	**-0.13**	-1.96	0.08	**-0.20**	-2.83	0.01	12	8	9	8	7
DEC. 10	**-0.04**	-0.94	0.12	**-0.06**	-1.68	0.24	**-0.02**	-0.58	0.30	**-0.14**	-2.13	0.03	**-0.19**	-2.84	0.00	8	11	10	7	5
DEC(1-10)	**0.06**	0.88	0.45	**0.07**	1.21	0.41	**0.05**	0.84	0.43	**0.15**	1.50	0.18	**0.27**	1.59	0.11	12	12	13	13	14

* Note: a figure of, say, B/M.A.R = 0.02 should be interpreted as B/M-Adjusted Returns of 2% calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 6.10.2

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
DECILE	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.02	0.76	0.93	-0.02	-0.43	0.52	0.01	0.19	0.50	0.02	0.35	0.86	0.08	0.71	0.90	9	9	9	11	10
DEC. 2	0.01	0.37	0.54	0.01	0.43	0.33	0.00	-0.11	0.78	0.02	0.34	0.78	0.01	0.20	0.81	13	10	10	9	12
DEC. 3	0.03	1.09	0.88	-0.02	-0.90	0.38	-0.04	-1.34	0.17	0.00	-0.05	0.93	-0.05	-0.83	0.33	10	11	9	12	10
DEC. 4	0.00	-0.07	0.72	0.01	0.24	0.67	-0.02	-0.82	0.22	0.02	0.34	0.93	-0.01	-0.18	0.76	12	13	10	11	8
DEC. 5	-0.04	-1.96	0.09	0.01	0.59	0.76	0.03	1.49	0.29	-0.02	-0.64	0.39	0.02	0.32	1.00	10	11	13	9	10
DEC. 6	-0.01	-0.44	0.76	-0.04	-1.64	0.16	-0.01	-0.54	0.52	-0.07	-1.41	0.20	-0.11	-1.64	0.18	12	9	9	10	9
DEC. 7	-0.01	-0.66	0.65	-0.01	-0.31	0.47	0.01	0.47	0.52	-0.03	-0.63	0.67	-0.01	-0.20	0.78	12	9	13	10	10
DEC. 8	0.04	2.05	0.06	-0.01	-0.61	0.69	0.00	-0.10	0.86	0.03	0.84	0.69	0.02	0.33	0.72	16	11	12	9	11
DEC. 9	-0.05	-2.14	0.02	0.01	0.21	0.78	0.03	0.84	0.58	-0.04	-0.79	0.05	-0.04	-0.89	0.41	6	10	13	7	11
DEC. 10	-0.05	-2.32	0.04	-0.01	-0.28	0.88	-0.03	-1.23	0.14	-0.05	-1.26	0.19	-0.09	-1.69	0.11	7	11	8	8	7
DEC(1-10)	0.07	1.85	0.08	-0.01	-0.17	0.48	0.04	0.82	0.67	0.07	1.06	0.54	0.17	1.32	0.36	16	9	13	10	14

* Note: a figure of, say, B/M.A.R = 0.02 should be interpreted as B/M-Adjusted Returns of 2% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
DECILE	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.03	1.16	0.32	-0.08	-1.98	0.06	-0.02	-0.46	0.56	-0.06	-1.05	0.08	-0.07	-0.83	0.15	13	9	11	6	7
DEC. 2	-0.01	-0.39	0.76	0.00	0.01	0.81	-0.01	-0.18	0.90	-0.01	-0.28	0.78	-0.02	-0.32	0.83	12	11	12	11	12
DEC. 3	0.01	0.35	0.52	0.00	0.17	0.90	-0.03	-1.18	0.39	0.00	0.12	0.93	-0.04	-0.93	0.35	13	11	10	12	10
DEC. 4	0.03	0.90	0.30	-0.01	-0.43	0.90	0.02	0.77	0.45	0.03	0.60	0.58	0.07	1.24	0.15	13	11	14	13	15
DEC. 5	-0.03	-1.45	0.27	-0.01	-0.38	0.52	0.01	0.48	0.78	-0.03	-1.04	0.24	-0.02	-0.40	0.63	10	11	12	10	11
DEC. 6	0.03	1.05	0.86	0.04	1.43	0.35	-0.04	-1.56	0.45	0.07	1.58	0.30	0.00	0.07	0.65	10	14	12	15	9
DEC. 7	0.01	0.51	0.67	0.01	0.38	0.98	0.04	1.51	0.33	0.01	0.42	0.93	0.08	1.56	0.13	13	11	14	10	14
DEC. 8	0.02	1.22	0.25	0.00	0.05	0.65	-0.02	-0.81	0.41	0.03	1.05	0.29	0.01	0.20	0.98	15	14	11	13	12
DEC. 9	-0.06	-2.46	0.04	-0.05	-1.77	0.09	0.00	0.04	0.86	-0.12	-3.11	0.01	-0.15	-2.75	0.02	9	7	12	5	6
DEC. 10	0.00	-0.03	0.93	-0.04	-1.51	0.21	-0.04	-1.02	0.20	-0.04	-0.66	0.72	-0.10	-1.32	0.22	12	9	7	12	11
DEC(1-10)	0.03	0.96	0.39	-0.03	-0.65	0.43	0.02	0.46	0.48	-0.02	-0.28	0.81	0.02	0.21	1.00	14	9	15	11	9

* Note: a figure of, say, B/M.A.R = 0.03 should be interpreted as B/M-Adjusted Returns of 3% calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 6.10.3

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-
DEC. 1	-0.04	-2.31	0.03	-0.02	-0.44	0.32	0.03	0.69	0.90	-0.07	-1.58	0.05	-0.04	-0.47	0.25
DEC. 2	0.01	0.46	0.93	-0.07	-2.87	0.01	-0.01	-0.24	0.56	-0.06	-1.59	0.11	-0.08	-1.33	0.20
DEC. 3	-0.01	-0.29	0.67	-0.01	-0.75	0.63	0.02	0.66	0.54	-0.02	-0.56	0.48	0.02	0.40	0.72
DEC. 4	0.00	0.05	0.86	0.00	-0.09	0.81	-0.03	-1.05	0.08	0.00	0.03	0.72	-0.04	-0.52	0.12
DEC. 5	-0.01	-0.22	0.86	0.00	-0.13	0.72	-0.03	-0.87	0.29	-0.02	-0.34	0.52	-0.04	-0.46	0.30
DEC. 6	0.03	1.21	0.33	-0.03	-1.23	0.27	-0.03	-1.36	0.29	0.00	0.01	0.88	-0.04	-0.79	0.48
DEC. 7	-0.04	-1.39	0.19	0.02	0.67	1.00	0.02	0.72	0.38	-0.01	-0.13	0.45	0.02	0.41	0.76
DEC. 8	-0.01	-0.26	0.81	0.02	0.88	0.38	0.00	0.08	0.86	0.03	0.67	0.52	0.03	0.65	0.48
DEC. 9	-0.03	-1.00	0.35	-0.04	-1.34	0.17	-0.04	-1.57	0.07	-0.09	-1.77	0.04	-0.16	-2.66	0.01
DEC. 10	-0.07	-3.50	0.00	0.01	0.29	0.83	-0.02	-0.69	0.58	-0.08	-1.65	0.06	-0.11	-1.75	0.04
DEC(1-10)	0.03	0.99	0.76	-0.03	-0.49	0.48	0.05	1.21	0.41	0.01	0.16	0.95	0.08	0.94	0.35

* Note: a figure of, say, B/M.A.R = -0.04 should be interpreted as B/M-Adjusted Returns of -4% calculated over the first 12 months as from portfolio formation.

No. of (+) B/M.A.R

DECILE	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	8	7	9	8	7
DEC. 2	10	6	11	6	7
DEC. 3	9	11	11	10	13
DEC. 4	11	11	7	11	8
DEC. 5	12	11	11	9	9
DEC. 6	14	10	11	12	10
DEC. 7	8	10	13	10	10
DEC. 8	11	12	12	12	12
DEC. 9	9	8	5	5	5
DEC. 10	4	12	10	5	5
DEC(1-10)	11	8	14	11	13

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-
DEC. 1	-0.07	-1.73	0.08	-0.04	-0.92	0.33	0.01	0.18	0.95	-0.11	-1.45	0.09	-0.18	-2.23	0.03
DEC. 2	-0.03	-0.74	0.36	0.03	0.79	0.69	0.02	0.50	0.52	-0.02	-0.40	0.81	0.01	0.12	0.88
DEC. 3	0.05	1.86	0.07	0.05	1.51	0.06	-0.04	-1.41	0.17	0.13	2.58	0.03	0.14	1.43	0.38
DEC. 4	0.03	1.14	0.32	-0.03	-0.77	0.69	0.01	0.25	0.54	0.02	0.44	0.41	0.05	0.87	0.35
DEC. 5	0.07	1.77	0.10	0.03	1.09	0.45	-0.02	-0.66	0.48	0.11	2.11	0.07	0.12	1.27	0.67
DEC. 6	0.03	0.70	0.52	-0.04	-1.69	0.11	-0.01	-0.30	0.93	-0.02	-0.55	0.88	-0.04	-0.67	0.56
DEC. 7	-0.04	-1.43	0.08	-0.02	-0.50	0.78	0.00	0.10	0.76	-0.06	-1.31	0.14	-0.08	-1.44	0.29
DEC. 8	0.00	0.07	0.83	0.00	0.00	0.86	0.03	0.92	0.45	0.00	0.02	0.72	0.05	0.69	0.48
DEC. 9	-0.01	-0.18	0.88	-0.06	-1.47	0.22	0.00	-0.16	0.74	-0.07	-1.48	0.21	-0.10	-1.60	0.22
DEC. 10	-0.07	-2.19	0.02	-0.03	-0.64	0.32	-0.04	-1.15	0.18	-0.13	-2.51	0.01	-0.22	-3.22	0.00
DEC(1-10)	0.01	0.18	0.88	-0.01	-0.15	0.83	0.05	1.09	0.35	0.02	0.19	0.88	0.04	0.39	0.81

* Note: a figure of, say, B/M.A.R = -0.07 should be interpreted as B/M-Adjusted Returns of -7% calculated over the first 12 months as from portfolio formation.

No. of (+) B/M.A.R

DECILE	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	9	8	10	6	7
DEC. 2	10	11	13	10	11
DEC. 3	16	17	9	14	13
DEC. 4	14	11	14	14	13
DEC. 5	15	12	10	13	12
DEC. 6	15	7	12	12	10
DEC. 7	8	10	13	9	12
DEC. 8	12	11	13	11	12
DEC. 9	11	10	14	8	11
DEC. 10	5	10	9	5	5
DEC(1-10)	13	10	14	12	12

SAMPLE (D):

TABLE 6.10.4

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
DECILE	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.01	0.24	0.54	-0.03	-1.03	0.32	0.00	0.15	0.78	-0.02	-0.34	0.27	0.02	0.20	0.48	9	8	10	10	9
DEC. 2	0.07	3.75	0.00	0.01	0.63	0.83	0.00	0.01	1.00	0.09	3.41	0.01	0.11	3.01	0.02	19	11	10	16	15
DEC. 3	-0.01	-0.29	0.63	-0.02	-1.08	0.21	-0.02	-0.93	0.45	-0.05	-1.13	0.25	-0.08	-1.41	0.21	10	9	11	8	8
DEC. 4	0.00	-0.11	1.00	0.00	0.00	0.93	-0.03	-1.39	0.07	0.00	0.03	0.86	-0.03	-0.67	0.65	11	13	9	11	10
DEC. 5	-0.02	-1.17	0.22	0.03	1.31	0.29	0.04	2.12	0.07	0.01	0.40	0.90	0.08	1.35	0.36	8	14	14	11	14
DEC. 6	-0.02	-0.73	0.69	-0.01	-0.54	0.76	-0.02	-0.92	0.45	-0.04	-1.01	0.47	-0.07	-1.27	0.20	12	11	9	10	8
DEC. 7	-0.01	-0.36	0.81	0.00	-0.01	0.98	0.03	1.47	0.11	-0.01	-0.20	0.76	0.02	0.36	0.74	13	13	15	14	11
DEC. 8	0.01	0.73	0.41	-0.01	-0.65	1.00	-0.02	-0.84	0.26	0.00	0.04	0.72	-0.05	-1.04	0.41	13	12	9	10	12
DEC. 9	-0.04	-1.98	0.06	0.00	-0.23	0.90	0.02	0.79	0.69	-0.04	-1.36	0.13	-0.03	-0.67	0.50	9	12	11	10	10
DEC. 10	-0.04	-2.28	0.04	0.00	-0.15	0.98	-0.02	-0.87	0.35	-0.04	-1.37	0.14	-0.06	-1.13	0.30	7	12	9	8	9
DEC(1-10)	0.05	1.30	0.56	-0.03	-0.72	0.45	0.03	0.66	0.74	0.03	0.44	0.98	0.07	0.77	0.45	11	10	12	9	13

* Note: a figure of, say, B/M.A.R = 0.01 should be interpreted as B/M-Adjusted Returns of 1% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
DECILE	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.01	0.35	0.47	-0.02	-0.73	0.76	0.01	0.52	0.32	-0.02	-0.46	0.67	0.01	0.14	0.63	15	9	15	11	12
DEC. 2	0.00	0.05	0.88	-0.01	-0.41	0.58	-0.03	-1.21	0.32	-0.02	-0.48	0.48	-0.08	-1.20	0.21	9	11	12	8	9
DEC. 3	-0.02	-0.77	0.65	-0.03	-1.27	0.35	-0.05	-2.41	0.04	-0.06	-1.70	0.08	-0.12	-2.55	0.02	12	11	7	7	7
DEC. 4	0.02	1.50	0.17	-0.03	-1.23	0.32	0.02	0.68	0.41	0.00	0.04	0.52	0.03	0.65	0.54	13	10	14	15	14
DEC. 5	-0.02	-1.08	0.33	0.01	0.34	0.98	0.00	0.17	0.74	-0.01	-0.41	0.65	-0.01	-0.21	0.47	11	11	9	9	10
DEC. 6	0.01	0.59	0.74	0.03	1.38	0.41	0.00	-0.08	0.67	0.04	1.32	0.41	0.06	1.24	0.54	13	13	13	13	10
DEC. 7	0.01	0.82	0.45	0.03	1.22	0.24	0.03	1.34	0.36	0.04	1.41	0.21	0.08	2.00	0.05	14	13	14	14	16
DEC. 8	0.00	0.22	0.93	-0.02	-0.75	0.50	-0.04	-1.70	0.08	-0.01	-0.39	0.65	-0.07	-1.59	0.13	12	10	7	9	8
DEC. 9	-0.04	-1.81	0.15	-0.05	-1.74	0.11	-0.01	-0.24	0.86	-0.09	-2.91	0.01	-0.13	-2.83	0.01	9	7	10	8	7
DEC. 10	0.01	0.36	0.50	-0.03	-1.02	0.56	-0.03	-0.78	0.48	-0.01	-0.24	0.76	-0.06	-0.86	0.48	15	10	11	13	13
DEC(1-10)	-0.01	-0.21	0.63	0.01	0.18	0.90	0.05	0.89	0.43	-0.01	-0.12	0.83	0.07	0.66	0.56	12	11	14	10	13

* Note: a figure of, say, B/M.A.R = 0.01 should be interpreted as B/M-Adjusted Returns of 1% calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 6.10.5

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-	No. of (+) B/M.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.53	0.19	-0.01	-0.37	0.23	0.00	0.11	0.51	-0.01	-0.33	0.22	0.01	0.18	0.32	10	8	9	8	11
DEC. 2	0.01	0.32	0.81	-0.01	-0.67	0.11	0.01	0.23	0.87	-0.01	-0.36	0.34	-0.02	-0.35	0.62	10	8	13	8	9
DEC. 3	0.01	0.29	0.60	-0.02	-1.36	0.18	-0.01	-0.58	0.60	-0.02	-0.64	0.29	-0.01	-0.24	0.21	10	10	12	10	7
DEC. 4	0.00	0.04	0.72	0.00	-0.23	0.86	-0.04	-1.81	0.05	0.00	0.12	0.93	-0.04	-0.77	0.38	14	12	8	11	10
DEC. 5	-0.02	-1.00	0.34	0.01	0.41	0.95	-0.01	-0.48	0.64	0.00	0.09	0.65	-0.01	-0.25	0.54	10	12	8	8	11
DEC. 6	0.01	0.58	0.41	-0.04	-1.90	0.21	-0.01	-0.89	0.50	-0.04	-1.12	0.52	-0.06	-1.34	0.26	16	10	11	12	10
DEC. 7	-0.02	-1.27	0.18	-0.01	-0.28	0.60	0.00	-0.19	0.92	-0.02	-0.61	0.47	-0.03	-0.59	0.40	7	9	11	9	10
DEC. 8	0.01	0.59	0.71	-0.02	-1.03	0.33	0.03	1.12	0.33	0.00	0.09	0.87	0.05	1.06	0.45	12	8	13	10	13
DEC. 9	-0.05	-2.34	0.01	-0.03	-1.26	0.11	-0.01	-0.48	0.47	-0.08	-2.15	0.00	-0.12	-3.38	0.00	6	11	11	7	6
DEC. 10	-0.05	-3.45	0.00	0.00	0.18	0.79	-0.02	-0.79	0.40	-0.06	-1.68	0.08	-0.08	-1.65	0.04	6	12	8	8	5
DEC(1-10)	0.04	1.62	0.08	-0.01	-0.43	0.36	0.02	0.60	0.71	0.04	0.86	0.69	0.09	1.11	0.52	15	11	10	11	14

* Note: a figure of, say, B/M.A.R = -0.01 should be interpreted as B/M-Adjusted Returns of -1% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS B/M.A.R*	t-	W.t-	SECOND 12 MONTHS B/M.A.R	t-	W.t-	THIRD 12 MONTHS B/M.A.R	t-	W.t-	FIRST 24 MONTHS B/M.A.R	t-	W.t-	FIRST 36 MONTHS B/M.A.R	t-	W.t-	No. of (+) B/M.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.02	0.90	0.59	-0.03	-1.01	0.08	0.01	0.17	0.77	-0.02	-0.48	0.24	0.01	0.08	0.18	11	8	12	10	8
DEC. 2	-0.01	-0.32	0.62	-0.02	-0.94	0.23	0.01	0.38	0.82	-0.02	-0.42	0.39	0.00	0.02	0.37	10	10	12	11	10
DEC. 3	0.01	0.73	0.45	0.04	1.83	0.10	-0.02	-0.81	0.63	0.06	1.83	0.13	0.05	0.95	0.57	11	15	11	14	12
DEC. 4	0.04	1.53	0.08	-0.01	-0.41	0.91	0.03	1.33	0.35	0.05	1.09	0.31	0.11	1.98	0.10	14	10	11	14	14
DEC. 5	0.01	0.47	0.90	0.02	0.95	0.44	-0.02	-1.19	0.40	0.04	1.18	0.49	0.04	0.68	0.71	12	11	8	11	12
DEC. 6	0.03	1.64	0.22	0.05	1.72	0.14	-0.03	-1.65	0.22	0.07	1.96	0.11	0.02	0.37	0.91	16	15	11	13	10
DEC. 7	-0.03	-1.51	0.14	0.00	-0.22	0.50	0.02	0.76	0.47	-0.04	-1.54	0.06	-0.04	-0.70	0.89	9	10	13	8	11
DEC. 8	0.00	-0.11	0.75	0.00	0.15	0.69	0.02	0.87	0.65	0.01	0.27	0.82	0.04	0.86	0.92	12	12	12	10	12
DEC. 9	-0.04	-1.59	0.14	-0.06	-2.44	0.01	-0.02	-0.68	0.47	-0.12	-3.30	0.00	-0.17	-3.95	0.00	10	7	10	6	5
DEC. 10	-0.02	-0.74	0.33	-0.05	-2.27	0.09	-0.03	-1.17	0.10	-0.09	-2.03	0.08	-0.14	-2.91	0.01	10	10	10	9	7
DEC(1-10)	0.04	1.24	0.24	0.02	0.53	0.95	0.04	0.94	0.31	0.06	1.07	0.44	0.15	1.43	0.33	15	13	12	14	14

* Note: a figure of, say, B/M.A.R = 0.02 should be interpreted as B/M-Adjusted Returns of 2% calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D): TABLE 6.10.6

AVERAGES OF THE EQUALLY- AND VALUE-WEIGHTED B/M-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.

(RESULTS ARE SUMMARISED AVERAGED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)

Panel (A): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using equally-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.02	-1.09	0.05	-0.02	-0.98	0.17	0.02	0.64	0.86	-0.04	-1.30	0.04	-0.01	-0.19	0.18	7	9	12	6	9
DEC. 2	0.04	2.30	0.03	-0.03	-1.47	0.09	0.00	-0.20	0.67	0.01	0.59	0.63	0.02	0.44	0.71	15	7	11	12	12
DEC. 3	-0.01	-0.41	0.45	-0.02	-1.31	0.20	0.00	-0.14	0.94	-0.03	-1.25	0.16	-0.03	-0.84	0.42	11	9	15	8	8
DEC. 4	0.00	-0.04	0.85	0.00	-0.07	1.00	-0.03	-1.69	0.01	0.00	0.04	0.91	-0.04	-0.79	0.14	13	12	8	11	10
DEC. 5	-0.01	-0.90	0.45	0.01	0.59	0.71	0.01	0.27	0.73	0.00	-0.06	0.74	0.02	0.32	0.86	10	12	12	11	11
DEC. 6	0.01	0.44	0.67	-0.02	-1.26	0.29	-0.03	-1.64	0.17	-0.02	-0.73	0.63	-0.06	-1.48	0.17	13	10	8	10	9
DEC. 7	-0.02	-1.36	0.23	0.01	0.54	0.92	0.02	1.49	0.09	-0.01	-0.22	0.52	0.02	0.56	0.91	11	15	14	10	13
DEC. 8	0.00	0.26	0.71	0.00	0.28	0.53	-0.01	-0.54	0.54	0.01	0.58	0.77	-0.01	-0.17	0.94	13	14	9	12	10
DEC. 9	-0.03	-1.94	0.06	-0.02	-1.24	0.24	-0.01	-0.64	0.25	-0.06	-2.23	0.01	-0.09	-2.46	0.01	9	11	9	8	5
DEC. 10	-0.06	-4.13	0.00	0.00	0.15	0.91	-0.02	-1.09	0.31	-0.06	-2.15	0.02	-0.09	-2.09	0.02	5	10	7	7	8
DEC(1-10)	0.04	1.65	0.53	-0.03	-0.83	0.29	0.04	1.34	0.43	0.02	0.42	0.96	0.07	1.21	0.22	13	9	10	12	13

* Note: a figure of, say, B/M.A.R = -0.02 should be interpreted as B/M-Adjusted Returns of -2% calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Book-to-Market-Adjusted Returns (B/M.A.R) using value-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) B/M.A.R				
	B/M.A.R*	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.03	-1.41	0.30	-0.03	-1.18	0.31	0.01	0.48	0.54	-0.07	-1.49	0.09	-0.09	-1.55	0.20	9	10	13	9	9
DEC. 2	-0.02	-0.61	0.44	0.01	0.40	0.94	-0.01	-0.27	0.80	-0.02	-0.62	0.52	-0.04	-0.63	0.33	10	13	11	11	12
DEC. 3	0.01	0.70	0.33	0.01	0.55	0.42	-0.04	-2.53	0.02	0.04	1.08	0.54	0.01	0.16	0.44	12	13	8	12	10
DEC. 4	0.03	1.77	0.09	-0.03	-1.33	0.34	0.01	0.69	0.33	0.01	0.38	0.33	0.04	1.09	0.30	15	10	12	13	13
DEC. 5	0.02	1.03	0.49	0.02	1.12	0.57	-0.01	-0.50	0.53	0.05	1.56	0.27	0.05	1.03	0.88	12	12	11	14	13
DEC. 6	0.02	0.90	0.43	0.00	-0.25	0.57	0.00	-0.29	0.90	0.01	0.29	0.64	0.01	0.28	0.97	14	12	8	11	13
DEC. 7	-0.02	-0.95	0.29	0.00	0.24	0.54	0.02	0.80	0.36	-0.01	-0.32	0.77	0.00	-0.01	0.60	10	11	12	12	13
DEC. 8	0.00	0.18	0.84	-0.01	-0.35	0.58	0.00	-0.14	0.65	-0.01	-0.19	0.51	-0.01	-0.13	0.68	12	9	8	10	11
DEC. 9	-0.02	-0.98	0.37	-0.05	-2.23	0.04	-0.01	-0.29	0.92	-0.08	-2.84	0.01	-0.11	-2.96	0.01	9	8	12	8	10
DEC. 10	-0.03	-1.32	0.18	-0.03	-1.08	0.25	-0.04	-1.36	0.15	-0.07	-1.95	0.09	-0.14	-2.83	0.01	7	9	10	7	8
DEC(1-10)	0.00	0.06	0.94	0.00	-0.05	1.00	0.05	1.39	0.21	0.01	0.10	0.95	0.06	0.75	0.54	12	13	11	10	12

* Note: a figure of, say, B/M.A.R = -0.03 should be interpreted as B/M-Adjusted Returns of -3% calculated over the first 12 months as from portfolio formation.

respectively, and deciles 9 and 10 of sample (C+D) produces value-weighted B/M-adjusted returns of -11% (t-stat. -2.96, Wilc. 0.013) and -14% (t-stat. -2.83, Wilc. 0.010), respectively. Again, the value-weighted B/M-adjusting test statistically suggests accepting the first *alternative* hypothesis that the highest abnormal accruals deciles produces negative adjusted returns.

On the other hand, results for deciles 1 and 2 using the value-weighted B/M-adjusting approach, varies between producing insignificant positive, negative, to significant negative adjusted returns. And so, we accept the *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns indistinguishable from zero, under the value-weighted B/M-adjusted returns.

High, but insignificant, positive value-weighted B/M-adjusted returns were earned on the arbitrage portfolio for samples (A) and (A+B) of 27% (t-stat. 1.59, Wilc. 0.114) and 15% (t-stat. 1.43, Wilc. 0.334), respectively. Therefore, we find that investing in the arbitrage portfolio produces abnormal returns indistinguishable from zero.

6.3.4 Size-and-Book-to-Market (S/B/M)-Adjusted Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals

Returns of a specific sample decile are adjusted by returns of specific S/B/M-control portfolio. At each portfolio formation date, all shares included in the samples (A, B, C, and D) with return records as at that date are pooled and sorted according to their sizes and assigned to five size quintiles. Independently, the shares are also sorted according to their B/M ratio and assigned to five B/M quintiles. 25 S/B/M portfolios are then obtained by intersecting the size and B/M quintiles. Monthly buy-and-hold returns on S/B/M portfolios are calculated for each of the 23 test periods.

At each portfolio formation date, sample deciles' buy-and-hold returns are recalculated after replacing each share's monthly original returns by its corresponding returns on S/B/M portfolios to estimate the sample decile S/B/M-control returns. S/B/M-adjusted returns for a sample decile are then obtained by matching the sample's original returns with their corresponding sample decile S/B/M-control returns.

Sample S/B/M-adjusted returns are estimated using the value-weighted basis. Value-weighted S/B/M-control portfolios are used to adjust value-weighted sample deciles' returns.

Panel (A) in table 6.11 shows the buy-and-hold test period returns calculated over three years for portfolios defined independently by size and B/M ratio averaged over 23 portfolio formations for each of the four samples (A, B, C, and D). The portfolio consisting of the largest shares within the lowest B/M group earns an average return (over 23 test periods) of 42%, 40%, 44%, and 40% over 36 months –(or 12.4%, 11.9%, 12.9%, and 11.9% annually), for the samples respectively. On the other hand, the portfolio representing the smallest shares within the highest B/M group earns an average return of 106%, 98%, 101%, and 96% over 36 months –(or 27.2%, 25.6%, 26.2%, and 25.1% annually), for the samples respectively. Furthermore, the relation between returns and 'size and B/M ratio' fits into pattern; with the highest returns for the smallest portfolios, the highest B/M ratio portfolios, and the smallest and highest B/M ratio portfolios.

An exciting pattern is that of the size effect. Remarkably it has been found for shares within the lowest B/M ratio category, e.g., the lowest B/M ratio category in sample (A), small firms earn 85% where big firms earn just 42% (over three years). On the other hand, the highest B/M ratio share category in the same sample, small firms earn 106% against 86% for the biggest group (over three years).

The same pattern can also be related to the value-glamour phenomenon as follows: within the largest category in sample (A), high B/M firms earn 86% where low B/M firms earn just 42%

TABLE 6.11

AVERAGES OF VALUE-WEIGHTED BUY-AND-HOLD TEST PERIOD RETURNS FOR PORTFOLIÔS DEFINED INDEPENDENTLY BY SIZE AND BOOK-TO-MARKET RATIO FOR EACH OF SAMPLES (A, B, C, and D). PERCENTAGES OF FIRMS WITHIN EACH SIZE-B/M PORTFOLIOS ARE ALSO PRESENTED. *(RETURNS IN THIS TABLE ARE ACCUMULATED OVER 36 MONTHS AS FROM PORTFOLIO FORMATIONS AND AVERAGED OVER 23 TEST PERIODS).*

Shares from all samples (together) with return records as at a sample portfolio formation date are sorted and assigned independently to five size and five B/M quintiles. 25 Size-B/M portfolios are obtained by intersecting the 5 size and 5 B/M quintiles, each year. Value-weighted buy-and-hold returns are estimated for each of these Size-B/M portfolios over the next 36 months as from portfolio formation. Return results are presented averaged over all 23 test periods for each sample. In panel (B) percentages of shares within each Size-B/M portfolio are presented based on all observations in all 23 test periods.

Panel (A): Average buy-and-hold test period returns for portfolios defined independently by size & B/M ratio.

SAMPLE	A				
No. Observations*	18145				
	SMALL				BIG
LOW B/M	0.85	0.76	0.63	0.51	0.42
	1.05	0.84	0.65	0.57	0.51
	0.93	0.64	0.63	0.72	0.65
	1.06	0.86	0.81	0.77	0.70
HIGH B/M	1.06	0.81	0.99	0.75	0.86

SAMPLE	B				
No. Observations*	18410				
	SMALL				BIG
LOW B/M	0.74	0.61	0.69	0.49	0.40
	0.81	0.70	0.56	0.53	0.51
	0.98	0.60	0.71	0.71	0.60
	0.95	0.78	0.70	0.78	0.64
HIGH B/M	0.98	0.78	0.88	0.83	0.83

SAMPLE	C				
No. Observations*	18096				
	SMALL				BIG
LOW B/M	0.70	0.54	0.67	0.46	0.44
	0.76	0.72	0.64	0.52	0.53
	0.82	0.58	0.61	0.69	0.66
	0.93	0.76	0.71	0.83	0.68
HIGH B/M	1.01	0.87	0.77	0.77	0.88

SAMPLE	D				
No. Observations*	18410				
	SMALL				BIG
LOW B/M	0.73	0.59	0.69	0.49	0.40
	0.82	0.72	0.57	0.54	0.51
	0.95	0.61	0.71	0.71	0.61
	0.96	0.79	0.72	0.79	0.65
HIGH B/M	0.96	0.78	0.87	0.83	0.86

* Note: results for each sample are based on all observations included in the four samples (A, B, C, and D) and not just on the firms in the sample itself.

Note also that a figure of, say, 0.85 should be interpreted as average buy-and-hold returns of 85% for small (alternatively low B/M) firms falling within the low B/M (small) firms quintile, accumulated over 36 months.

Panel (B): Percentages of firms within each size-B/M ratio quintiles.

SAMPLE	A					
No. Observations	18145					
	SMALL				BIG	Total
LOW B/M	0.07	0.12	0.20	0.28	0.33	1.00
	0.10	0.16	0.22	0.26	0.27	1.00
	0.13	0.20	0.22	0.22	0.22	1.00
	0.24	0.27	0.21	0.15	0.13	1.00
HIGH B/M	0.47	0.25	0.14	0.09	0.06	1.00
Total	1.00	1.00	1.00	1.00	1.00	

SAMPLE	B					
No. Observations	18410					
	SMALL				BIG	Total
LOW B/M	0.07	0.13	0.21	0.28	0.31	1.00
	0.09	0.16	0.22	0.26	0.28	1.00
	0.12	0.19	0.23	0.22	0.23	1.00
	0.24	0.28	0.21	0.15	0.13	1.00
HIGH B/M	0.47	0.24	0.14	0.09	0.06	1.00
Total	1.00	1.00	1.00	1.00	1.00	

SAMPLE	C					
No. Observations	18096					
	SMALL				BIG	Total
LOW B/M	0.06	0.13	0.20	0.28	0.33	1.00
	0.09	0.16	0.22	0.27	0.27	1.00
	0.12	0.21	0.23	0.21	0.22	1.00
	0.23	0.28	0.22	0.16	0.12	1.00
HIGH B/M	0.50	0.23	0.13	0.08	0.05	1.00
Total	1.00	1.00	1.00	1.00	1.00	

SAMPLE	D					
No. Observations	18410					
	SMALL				BIG	Total
LOW B/M	0.07	0.13	0.21	0.28	0.31	1.00
	0.09	0.15	0.22	0.26	0.28	1.00
	0.13	0.20	0.23	0.22	0.23	1.00
	0.24	0.28	0.21	0.15	0.13	1.00
HIGH B/M	0.48	0.24	0.13	0.09	0.06	1.00
Total	1.00	1.00	1.00	1.00	1.00	

Note also that a figure of, say, 0.07 should be interpreted as a percentage of 7% of all firms in small (alternatively low B/M) quintile, fall within the low B/M (small) firms quintile.

(over three years). On the other hand, the smallest share category, high B/M firms earn 106% against 85% for the low B/M group (over three years).

Panel (B) of the same table shows percentages of shares within each size (equivalently B/M) quintile falling in each B/M (size) quintile. The percentages are based on observations in all 23 portfolio formations. All four samples display the same pattern with the highest percentages of 47%, 47%, 50%, and 48% for the highest B/M shares falling within the smallest portfolio groups for the samples, respectively. High share concentrations can also be observed for the lowest B/M equity firms falling within the biggest size category with percentages of 33%, 31%, 33%, and 31% respectively.

Estimated sample deciles' abnormal returns using the S/B/M adjusting method are presented in tables 6.12.1, 6.12.2, 6.12.3, 6.12.4, 6.12.5, and 6.12.6 for the samples (A, B, C, and D) and their combinations samples (A+B), and (C+D), respectively. Results of samples (A+B), and (C+D) are combined together by averaging 46 -(23 observations from each individual sample)- annually S/B/M-adjusted returns for samples [(A) and (B)], and [(C) and (D)], respectively.

Accumulated over 36 months, significant negative abnormal returns are observed for deciles 9 or/and 10 (i.e., the highest abnormal accruals deciles) at the 95% level of confidence and sometimes at the 99% level of confidence using the two-tailed test.

E.g., deciles 9 and 10 for sample (A+B) produce value-weighted S/B/M-adjusted returns of -15% (t-stat. -3.49, Wilc. 0.005) and -13% (t-stat. -2.53, Wilc. 0.016), respectively. Corresponding results of sample (C+D) are -14% (t-stat. -3.14, Wilc. 0.006) and -14% (t-stat. -2.88, Wilc. 0.005), respectively.

The value-weighted S/B/M test statistically suggests accepting the first *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns.

TABLE 6.12

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED FOR EACH SAMPLE FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively.* Then, a share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively. Deciles' returns are adjusted using returns calculated on S/B/M-control portfolios. Returns of a specific sample decile are adjusted by returns of specific S/B/M-control portfolio. All shares included in the four samples (A, B, C, and D) with return data as at the date of a sample portfolio's formation are sorted according to their sizes and assigned to five size quintiles. At the same time, the same shares are also independently sorted according to their B/M ratio and assigned to five B/M quintiles. Monthly returns are calculated on each of 25 S/B/M portfolios resulting from the intersection between the size and B/M quintile groups. Original sample shares' monthly returns are replaced each by its corresponding S/B/M-portfolio's return. Sample deciles' buy-and-hold returns are then recalculated to obtain the sample deciles' S/B/M control returns. S/B/M-adjusted returns for a sample decile are estimated by matching the sample's original returns with their corresponding S/B/M-control returns. Sample S/B/M-adjusted returns are estimated using value-weighted method. Value-weighted S/B/M-control portfolios are used to adjust value-weighted sample deciles' returns. All presented numbers are averages over the 23 test periods. Results are presented for 5 distinct periods: the first 12-months, the second 12-months, the third 12-months, the first 24-months, and finally the whole 36 month-test period. Tables 6.12.1, 6.12.2, 6.12.3, and 6.12.4 present the mentioned samples' S/B/M-adjusted returns respectively. Also, results of samples (A+B), and (C+D) are combined together on the basis of their annual S/B/M- adjusted returns in tables 6.12.5, and 6.12.6, respectively.

The tables are prepared as follows:

The number of positive S/B/M-adjusted returns is recorded on the right hand-side. The highest possible positive occurrence is 23, i.e., number of test periods. The last line shows the difference in S/B/M-adjusted returns between decile number 1 (i.e., the lowest abnormal accruals decile) and decile number 10 (i.e., the highest abnormal accruals decile). *The estimated S/B/M-adjusted returns are presented accompanied with t-statistic (t-) and the non-parametric Wilcoxon Signed-Rank Test (W.t-), where:*

- *Shows significant negative-adjusted returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red this shows significant negative-adjusted returns at 1% two-tailed (critical t- is -2.8).*
- *Shows significant positive-excess returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue this shows significant positive-excess returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 6.12.1

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis. | ***No. of (+) S/B/M.A.R***

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			FIRST	SECONI	THIRD	FIRST	FIRST
DECILE	S/B/M.A.R*	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	12/M	12/M	12/M	24/M	36/M
DEC. 1	-0.01	-0.24	0.36	-0.02	-0.43	0.29	0.02	0.39	0.72	-0.05	-0.80	0.43	-0.03	-0.24	0.58	8	8	13	10	9
DEC. 2	0.00	0.01	0.76	-0.03	-0.96	0.36	0.04	0.71	0.58	-0.02	-0.23	0.39	0.04	0.30	0.27	9	9	14	8	8
DEC. 3	0.02	0.60	0.45	0.10	2.45	0.00	0.00	0.10	0.95	0.15	2.37	0.02	0.19	2.04	0.05	13	17	13	16	17
DEC. 4	0.05	1.32	0.09	-0.04	-1.18	0.45	0.03	0.72	0.93	0.01	0.22	0.76	0.09	1.01	0.56	16	10	12	12	11
DEC. 5	0.04	0.87	0.47	0.04	0.97	0.25	-0.07	-1.71	0.11	0.10	1.50	0.16	0.07	0.66	0.67	13	13	9	14	13
DEC. 6	0.01	0.36	0.74	0.06	1.35	0.30	-0.02	-0.80	0.39	0.04	0.71	0.35	0.01	0.14	0.98	14	13	10	13	10
DEC. 7	-0.06	-1.74	0.06	-0.01	-0.25	0.72	0.02	0.35	0.76	-0.08	-1.86	0.02	-0.10	-1.34	0.24	9	11	12	6	9
DEC. 8	-0.05	-1.72	0.09	-0.02	-0.73	0.39	0.05	1.21	0.35	-0.08	-2.02	0.06	0.00	-0.03	0.81	9	11	14	8	10
DEC. 9	-0.02	-0.51	0.83	-0.06	-1.35	0.14	-0.03	-0.90	0.47	-0.10	-1.76	0.09	-0.16	-2.37	0.07	11	8	12	10	9
DEC. 10	-0.02	-0.54	0.21	-0.08	-2.07	0.08	-0.02	-0.78	0.19	-0.13	-1.92	0.06	-0.19	-2.45	0.03	6	8	8	6	6
DEC(1-10)	0.01	0.18	0.98	0.05	0.93	0.52	0.04	0.86	0.45	0.07	0.77	0.48	0.16	1.11	0.24	9	13	13	13	14

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= -0.01 should be interpreted as a S/B/M-adjusted return of -1% calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 6.12.2

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis. | ***No. of (+) S/B/M.A.R***

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
	S/B/M.A.R*	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-					
DEC. 1	0.02	0.78	0.52	-0.07	-1.73	0.06	0.00	-0.09	0.93	-0.06	-1.14	0.19	-0.07	-0.95	0.20	13	6	13	7	7
DEC. 2	0.00	0.02	0.93	0.00	-0.05	0.58	-0.03	-1.12	0.26	-0.01	-0.12	0.90	-0.05	-0.72	0.52	12	11	10	11	11
DEC. 3	-0.01	-0.50	0.86	0.01	0.52	0.95	-0.02	-0.79	0.69	-0.01	-0.24	0.98	-0.04	-0.73	0.52	14	12	12	11	10
DEC. 4	0.01	0.30	0.50	-0.01	-0.45	0.72	0.03	0.96	0.38	0.01	0.13	0.81	0.05	0.72	0.41	13	9	14	9	12
DEC. 5	-0.03	-1.08	0.38	0.01	0.39	0.76	0.01	0.58	0.38	-0.02	-0.48	0.61	0.00	0.04	0.76	11	13	16	11	14
DEC. 6	0.03	1.29	0.39	0.06	1.77	0.18	-0.07	-2.55	0.01	0.11	2.23	0.05	0.00	-0.06	0.69	13	13	6	15	11
DEC. 7	0.02	1.47	0.06	0.02	0.77	0.86	0.06	2.27	0.08	0.04	1.26	0.33	0.14	2.59	0.02	17	10	14	12	15
DEC. 8	0.02	0.78	0.43	0.00	0.11	0.45	-0.01	-0.52	0.90	0.02	0.61	0.47	0.02	0.33	0.45	12	13	13	13	13
DEC. 9	-0.05	-1.90	0.11	-0.06	-1.99	0.09	0.01	0.41	0.78	-0.13	-2.70	0.01	-0.14	-2.56	0.02	8	8	13	6	6
DEC. 10	0.01	0.27	0.78	-0.05	-1.64	0.09	-0.03	-0.70	0.43	-0.04	-0.69	0.56	-0.07	-1.05	0.30	13	7	9	13	11
DEC(1-10)	0.01	0.31	0.58	-0.02	-0.40	0.50	0.02	0.43	0.45	-0.02	-0.38	0.78	0.00	-0.04	0.90	13	10	16	11	9

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= 0.02 should be interpreted as a S/B/M-adjusted return of 2% calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 6.12.3

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis.

DECILE	FIRST 12 MONTHS S/B/M.A.R*	t-	W.t-	SECOND 12 MONTHS S/B/M.A.R	t-	W.t-	THIRD 12 MONTHS S/B/M.A.R	t-	W.t-	FIRST 24 MONTHS S/B/M.A.R	t-	W.t-	FIRST 36 MONTHS S/B/M.A.R	t-	W.t-
DEC. 1	-0.03	-0.78	0.13	-0.04	-1.14	0.26	0.01	0.18	0.78	-0.08	-0.99	0.10	-0.15	-2.01	0.06
DEC. 2	-0.03	-0.77	0.50	0.03	0.80	0.83	0.01	0.28	0.76	-0.01	-0.18	0.81	0.02	0.20	0.95
DEC. 3	0.03	1.30	0.17	0.06	1.75	0.11	-0.04	-1.19	0.13	0.13	2.33	0.03	0.16	1.29	0.58
DEC. 4	0.02	0.58	0.58	-0.03	-0.84	0.47	0.02	0.54	0.52	0.00	0.00	0.67	0.03	0.59	0.48
DEC. 5	0.07	1.47	0.14	0.04	1.26	0.39	-0.02	-0.61	0.58	0.12	2.15	0.04	0.14	1.35	0.43
DEC. 6	0.03	0.85	0.32	-0.04	-1.32	0.17	0.01	0.45	0.67	-0.02	-0.32	0.83	-0.01	-0.10	0.72
DEC. 7	-0.05	-1.54	0.08	-0.02	-0.64	0.26	0.00	-0.02	0.63	-0.08	-1.78	0.13	-0.11	-2.04	0.08
DEC. 8	-0.02	-0.60	0.50	0.00	-0.07	0.95	0.03	0.82	0.81	-0.04	-0.68	0.30	0.01	0.13	0.98
DEC. 9	0.01	0.27	0.78	-0.08	-2.01	0.08	0.01	0.18	0.67	-0.08	-1.68	0.11	-0.09	-1.32	0.27
DEC. 10	-0.06	-1.69	0.09	-0.03	-0.65	0.32	-0.05	-1.46	0.09	-0.13	-2.31	0.02	-0.22	-3.33	0.00
DEC(1-10)	0.03	0.54	0.72	-0.01	-0.18	0.98	0.06	1.14	0.41	0.05	0.47	0.95	0.08	0.68	0.76

No. of (+) S/B/M.A.R

DECILE	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	7	9	12	7	7
DEC. 2	11	10	13	8	11
DEC. 3	13	14	8	16	14
DEC. 4	14	10	14	13	12
DEC. 5	14	13	11	16	12
DEC. 6	14	7	12	13	11
DEC. 7	8	8	14	8	8
DEC. 8	11	12	11	8	11
DEC. 9	13	7	13	6	9
DEC. 10	8	11	7	6	5
DEC(1-10)	12	10	13	11	12

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= -0.03 should be interpreted as a S/B/M-adjusted return of -3% calculated over the first 12 months as from portfolio formation.

SAMPLE (D):

TABLE 6.12.4

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 23 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis. — ***No. of (+) S/B/M.A.R***

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS			FIRST 24 MONTHS			FIRST 36 MONTHS			No. of (+) S/B/M.A.R				
	S/B/M.A.R*	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	S/B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.01	-0.44	0.67	-0.02	-0.68	0.54	0.03	1.28	0.05	-0.04	-0.86	0.21	0.00	0.03	1.00	11	12	17	9	11
DEC. 2	0.01	0.50	0.48	0.00	-0.13	0.72	-0.05	-2.00	0.07	0.00	0.02	0.83	-0.08	-1.34	0.11	13	10	9	10	8
DEC. 3	-0.04	-1.37	0.29	-0.03	-1.36	0.25	-0.04	-2.03	0.07	-0.08	-2.43	0.03	-0.13	-2.73	0.03	10	10	8	5	8
DEC. 4	0.03	1.15	0.30	-0.03	-1.13	0.35	0.00	0.08	0.65	0.00	-0.02	0.95	0.00	0.04	0.93	13	8	13	11	12
DEC. 5	-0.04	-1.47	0.22	0.03	1.67	0.17	0.00	0.18	0.69	0.00	-0.01	0.98	0.01	0.19	0.76	10	15	13	12	12
DEC. 6	0.01	0.50	0.72	0.02	0.74	0.52	-0.01	-0.32	0.95	0.03	0.76	0.58	0.02	0.48	0.67	11	13	11	12	11
DEC. 7	0.00	-0.07	0.90	0.03	1.23	0.26	0.03	1.32	0.30	0.03	0.78	0.67	0.07	1.61	0.08	13	12	12	13	16
DEC. 8	0.01	0.25	0.83	0.01	0.24	0.74	-0.04	-1.42	0.14	0.01	0.22	0.93	-0.04	-0.68	0.58	11	10	10	11	11
DEC. 9	-0.04	-1.63	0.22	-0.08	-2.34	0.04	-0.02	-0.66	0.61	-0.13	-3.03	0.01	-0.18	-3.43	0.01	11	7	11	7	5
DEC. 10	0.02	0.56	0.65	-0.03	-1.22	0.39	-0.04	-0.82	0.50	-0.01	-0.20	0.88	-0.05	-0.77	0.41	13	12	11	14	10
DEC(1-10)	-0.03	-0.77	0.43	0.01	0.18	0.76	0.07	1.21	0.21	-0.03	-0.51	0.56	0.05	0.54	0.56	10	12	14	9	13

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= -0.01 should be interpreted as a S/B/M-adjusted return of -1% calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 6.12.5

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS: FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis. / ***No. of (+) S/B/M.A.R***

DECILE	FIRST 12 MONTHS S/B/M.A.R*	t-	W.t-	SECOND 12 MONTHS S/B/M.A.R	t-	W.t-	THIRD 12 MONTHS S/B/M.A.R	t-	W.t-	FIRST 24 MONTHS S/B/M.A.R	t-	W.t-	FIRST 36 MONTHS S/B/M.A.R	t-	W.t-	FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	0.01	0.21	0.80	-0.05	-1.41	0.04	0.01	0.24	0.64	-0.06	-1.35	0.13	-0.05	-0.74	0.22	11	5	12	11	9
DEC. 2	0.00	0.02	0.85	-0.02	-0.78	0.29	0.00	0.10	0.90	-0.01	-0.26	0.43	-0.01	-0.07	0.21	12	11	12	13	8
DEC. 3	0.00	0.19	0.61	0.06	2.31	0.03	-0.01	-0.43	0.81	0.07	1.97	0.07	0.08	1.41	0.26	14	17	10	17	12
DEC. 4	0.03	1.14	0.10	-0.03	-1.20	0.40	0.03	1.17	0.45	0.01	0.24	1.00	0.07	1.25	0.31	14	7	9	10	12
DEC. 5	0.00	0.13	0.89	0.02	1.04	0.35	-0.03	-1.21	0.48	0.04	0.96	0.41	0.03	0.58	0.59	9	12	9	14	12
DEC. 6	0.02	1.11	0.33	0.06	2.20	0.09	-0.05	-2.32	0.02	0.08	1.95	0.04	0.00	0.06	0.86	14	17	9	17	13
DEC. 7	-0.02	-0.96	0.57	0.01	0.37	0.90	0.04	1.52	0.15	-0.02	-0.75	0.23	0.02	0.35	0.49	11	12	14	11	10
DEC. 8	-0.02	-0.88	0.48	-0.01	-0.41	0.95	0.02	0.83	0.49	-0.03	-1.05	0.43	0.01	0.18	0.81	10	13	12	9	11
DEC. 9	-0.04	-1.49	0.23	-0.06	-2.31	0.03	-0.01	-0.46	0.70	-0.11	-3.10	0.00	-0.15	-3.49	0.01	10	10	10	7	9
DEC. 10	-0.01	-0.23	0.49	-0.06	-2.66	0.02	-0.03	-1.04	0.16	-0.08	-1.91	0.07	-0.13	-2.53	0.02	8	9	10	7	5
DEC(1-10)	0.01	0.32	0.78	0.02	0.48	0.93	0.03	0.91	0.25	0.03	0.45	0.71	0.08	0.91	0.42	12	12	15	13	15

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= 0.01 should be interpreted as a S/B/M-adjusted return of 1% calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D): **TABLE 6.12.6**

AVERAGES OF THE VALUE-WEIGHTED SIZE-and-BOOK-TO-MARKET (S/B/M)-ADJUSTED RETURNS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(RESULTS ARE SUMMARISED OVER 46 PORTFOLIO FORMATIONS FOR FIVE PERIODS; FIRST 12, SECOND 12, THIRD 12, FIRST 24, AND FIRST 36 MONTHS.)*

Deciles' estimated Size-and-Book-to-Market-Adjusted Returns (S/B/M.A.R) using the value-weighted basis.

DECILE	FIRST 12 MONTHS S/B/M.A.R*	t-	W.t-	SECOND 12 MONTHS S/B/M.A.R	t-	W.t-	THIRD 12 MONTHS S/B/M.A.R	t-	W.t-	FIRST 24 MONTHS S/B/M.A.R	t-	W.t-	FIRST 36 MONTHS S/B/M.A.R	t-	W.t-	No. of (+) S/B/M.A.R FIRST 12/M	SECOND 12/M	THIRD 12/M	FIRST 24/M	FIRST 36/M
DEC. 1	-0.02	-0.90	0.11	-0.03	-1.31	0.19	0.02	0.85	0.20	-0.06	-1.30	0.04	-0.07	-1.42	0.17	8	10	11	8	11
DEC. 2	-0.01	-0.35	0.98	0.01	0.54	0.92	-0.02	-0.83	0.45	0.00	-0.12	0.73	-0.03	-0.59	0.27	13	13	11	13	11
DEC. 3	0.00	-0.04	0.81	0.02	0.77	0.60	-0.04	-1.99	0.02	0.03	0.81	0.70	0.01	0.20	0.33	13	14	8	12	9
DEC. 4	0.02	1.20	0.26	-0.03	-1.35	0.23	0.01	0.41	0.49	0.00	-0.01	0.82	0.02	0.45	0.70	17	7	12	12	12
DEC. 5	0.01	0.50	0.84	0.04	1.98	0.12	-0.01	-0.46	0.82	0.06	1.69	0.14	0.07	1.26	0.47	11	14	10	14	14
DEC. 6	0.02	0.99	0.30	-0.01	-0.53	0.54	0.00	0.23	0.87	0.00	0.16	0.82	0.01	0.20	0.97	13	10	10	13	12
DEC. 7	-0.02	-1.35	0.18	0.00	0.21	0.92	0.02	0.78	0.36	-0.03	-0.81	0.50	-0.02	-0.63	0.76	10	11	13	12	11
DEC. 8	-0.01	-0.34	0.67	0.00	0.09	0.81	0.00	-0.18	0.43	-0.01	-0.44	0.42	-0.01	-0.24	0.58	10	13	8	10	10
DEC. 9	-0.01	-0.68	0.54	-0.08	-3.09	0.01	-0.01	-0.28	0.94	-0.11	-3.26	0.00	-0.14	-3.14	0.01	9	6	9	7	8
DEC. 10	-0.02	-0.87	0.33	-0.03	-1.16	0.19	-0.04	-1.58	0.12	-0.07	-1.81	0.10	-0.14	-2.88	0.01	8	10	9	6	6
DEC(1-10)	0.00	0.03	0.88	0.00	-0.06	0.90	0.06	1.68	0.14	0.01	0.17	0.74	0.06	0.87	0.57	11	11	12	10	13

* S/B/M.A.R: Size_Book-to-Market-Adjusted Returns.

Note that a figure of, say, S/B/M.A.R= -0.02 should be interpreted as a S/B/M-adjusted return of -2% calculated over the first 12 months as from portfolio formation.

On the other hand, deciles 1 and 2 produce more negative than positive adjusted returns. Decile 1 in sample (C) produces the highest negative adjusted returns over three years of -15% (t-stat. -2.01, Wilc. 0.064) followed by Decile 1 in sample (C+D) with return of -7% (t-stat. -1.42, Wilc. 0.174), all returns are over three years.

And so, we find evidence supporting that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero.

Generally speaking, the arbitrage portfolio produces insignificant positive value-weighted S/B/M-adjusted returns; the highest is 16% (t-stat. 1.11, Wilc. 0.236) for sample (A). Samples (A+B) and (C+D) produce 8% (t-stat. 0.91, Wilc. 0.416) and 6% (t-stat. 0.87, Wilc. 0.574). Consequently, we find evidence that investing in the arbitrage portfolio produces value-weighted S/B/M-adjusted returns undifferentiated from zero.

6.4 Consistency of the Abnormal Accruals Anomaly Using the Market, the Size, the B/M, and the S/B/M Methods for Adjusting Samples' Returns

Results of the persistency of the abnormal accruals anomaly are presented in two main ways. In the first, we present the number of positive abnormal returns earned by different abnormal accruals deciles using the equally-weighted basis as appears on the right hand-side of panels (A) of tables 6.3.1 to 6.3.6 for the market-adjusting tests, tables 6.7.1 to 6.7.6 for the size-adjusting tests, and tables 6.10.1 to 6.10.6 for the B/M-adjusting tests. On the other hand, results of consistency when the value-weighted basis is applied are presented to the right hand-side of panels (B) of the same tables for the market-, the size- and the B/M-adjusting tests, respectively. We also report results of the consistency of the abnormal accruals anomaly when the S/B/M-adjusting test is used on the right hand-side of tables 6.12.1 to 6.12.6 for the samples, respectively. In the second, using the value-weighted basis abnormal returns are plotted for (i) the lowest abnormal accruals decile (i.e., decile 1), (ii) the highest abnormal accruals decile (i.e., decile 10), and (iii) the arbitrage portfolio (decile 1- decile 10) for all six samples (A, B, C, and D), (A+B) and (C+D) in figures 6.2, 6.3, 6.4, 6.5, 6.6, and 6.7, respectively. Decile adjusted returns are plotted for (i) the market-adjusting method, (ii) the size-adjusting method, (iii) the B/M-adjusting method, and finally (iv) the S/B/M-adjusting method.

All six samples display almost the same results. Regarding the highest abnormal accruals decile 10 there is apparent tendency to produce mostly negative abnormal returns. On the other hand, the lowest abnormal accruals tend to produce more negative than positive insignificant abnormal returns. Results of these tests highlight that the abnormal accruals anomaly is mainly driven by the highest abnormal accruals deciles.

In this section, we present consistency results of the two main sample combinations (A+B) and (C+D) as they are expected to better describe the market as was mentioned before.

Panels (A) in tables 6.3.5 and 6.3.6 show results of persistency for samples (A+B) and (C+D) of the equally-weighted market-adjusted returns, indicating that for sample (A+B) a number of 6, 6, and 14 all out of 23 are the times abnormal returns were positive for the deciles 1, 10, and the arbitrage portfolio, respectively. Sample's (C+D) corresponding results were 8, 5, and 13, respectively.

Using the equally-weighted size-adjusted method results of persistency in table 6.7.5 indicate that for sample (A+B) 9, 7, and 13 all out of 23 are the times abnormal returns were positive for the deciles 1, 10, and the arbitrage portfolio, respectively. Table 6.7.6 shows that sample's (C+D) corresponding results were 10, 8, and 12, respectively.

Finally, results of persistency resulting from applying the equally-weighted B/M-adjusting method in table 6.10.5 indicate that for sample (A+B) 11, 5, and 14 all out of 23 are the times abnormal returns were positive for the deciles 1, 10, and the arbitrage portfolio, respectively. Table 6.10.6 shows that sample's (C+D) corresponding results were 9, 8, and 13, respectively.

In terms of value-weighted basis, panels (B) of tables 6.3.5, 6.7.5, and 6.10.5 show results of persistency for sample (A+B) for the market-adjusting, size-adjusting, and B/M-adjusting methods, respectively. Positive abnormal returns of [(7, 3, and 14), (8, 4, and 13), and (8, 7, and 14)] were obtained for deciles 1, 10, and the arbitrage portfolio, for the three mentioned methods for adjusting returns, respectively. Corresponding results using the S/B/M-adjusting test are shown in table 6.12.5 of (9, 5, and 15), respectively.

Figure 6.6 plots the mentioned abnormal returns for sample (A+B). Decile number 1 tend to produce more negative than positive (except for the formations 1983, 1984, and 1985 when sample (A) produced exceptional positive abnormal returns as a result of mergers on the largest firms in the decile as was mentioned in footnote 7) abnormal returns. Decile 10 mostly produces negative abnormal returns using all four methods for adjusting returns, though it produces relatively high positive abnormal return on mainly three occasions, the 4^{th}, 21^{st}, and 23^{rd} formations.

The generally significant negative abnormal returns for decile 10 against the many insignificant negative abnormal returns for decile 1, made the arbitrage portfolio unprofitable with apparently more positive than negative abnormal returns, all of them insignificant.

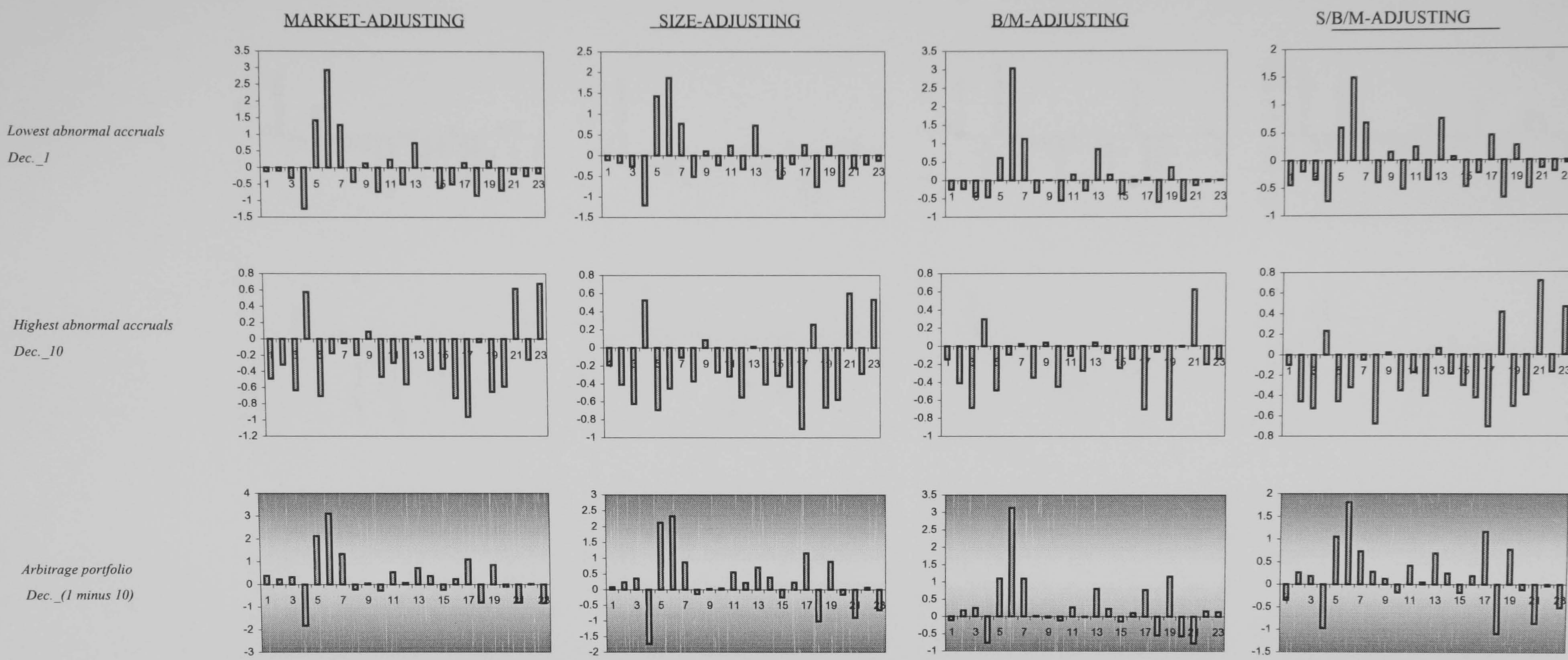
Panels (B) tables 6.3.6, 6.7.6, and 6.10.6 show results of persistency for sample (C+D) using value-weighted market-adjusting, size-adjusting, and B/M-adjusting methods, respectively. Positive abnormal returns of [(5, 5, and 13), (8, 4, and 14), and (9, 8, and 12)] were observed for deciles 1, 10, and the arbitrage portfolio, for the three mentioned methods for adjusting returns, respectively. Corresponding results using the S/B/M-adjusting test are shown in table 6.12.6 of (11, 6, and 13), respectively.

Figure 6.7 shows similar evidence to that of figure 6.6.

SAMPLE (A): **FIGURE 6.2**

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.



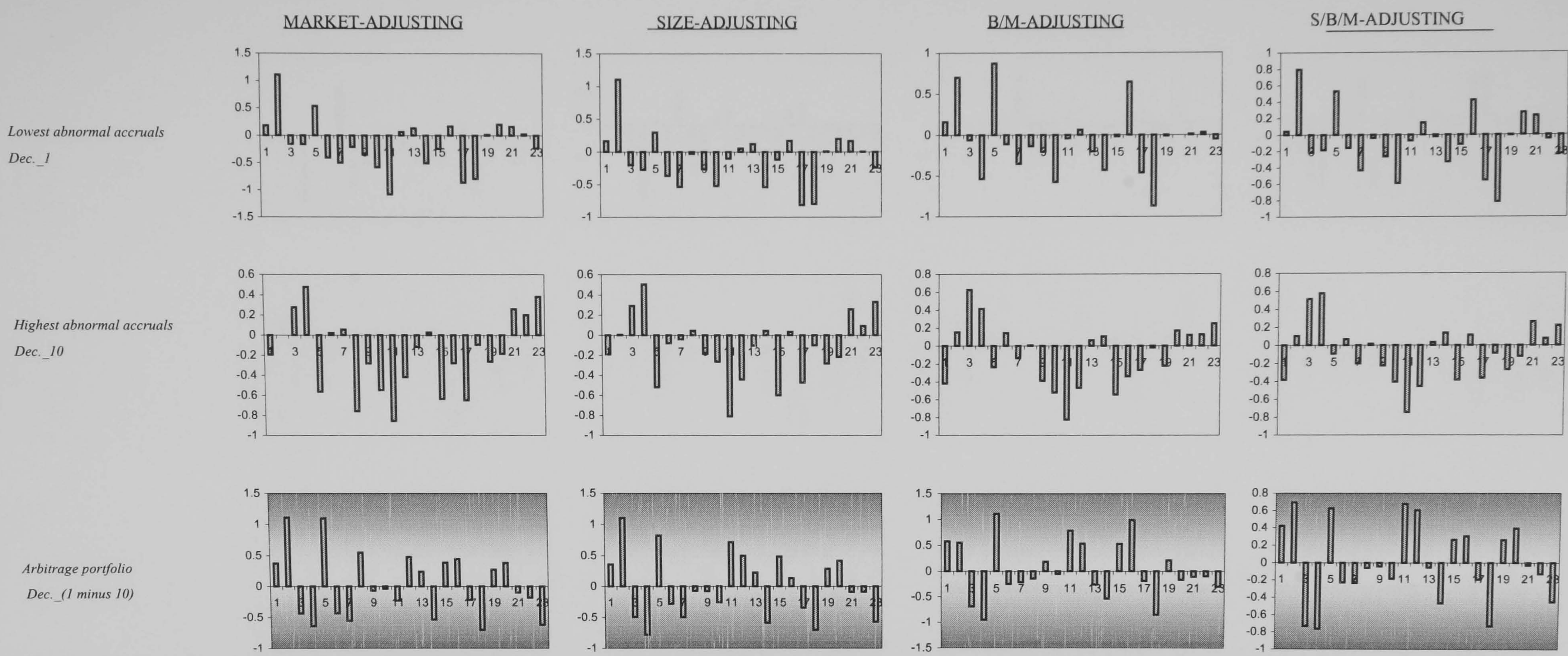
Note that a figure of, say, 3.5 on the vertical axis should be interpreted as excess performance of 350% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

SAMPLE (B):

FIGURE 6.3

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.



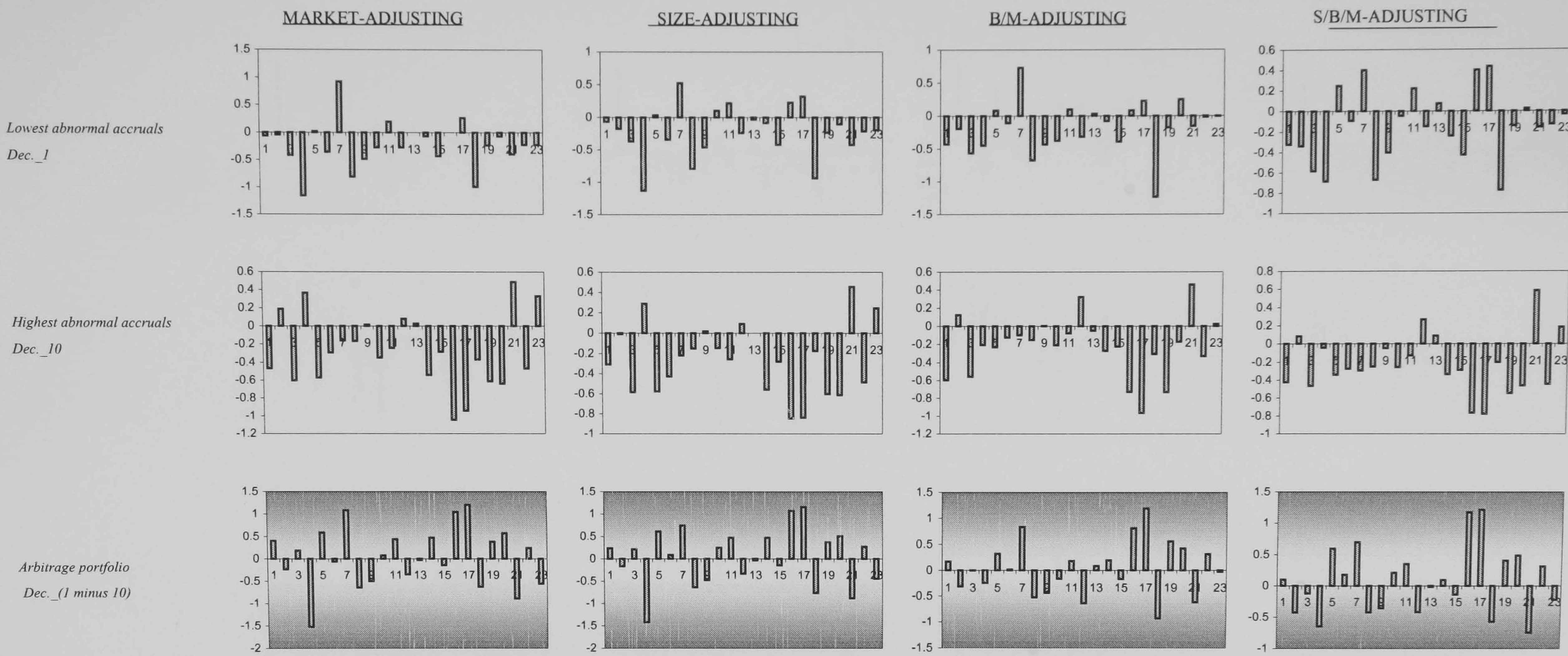
Note that a figure of, say, 1.5 on the vertical axis should be interpreted as excess performance of 150% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

SAMPLE (C):

FIGURE 6.4

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.

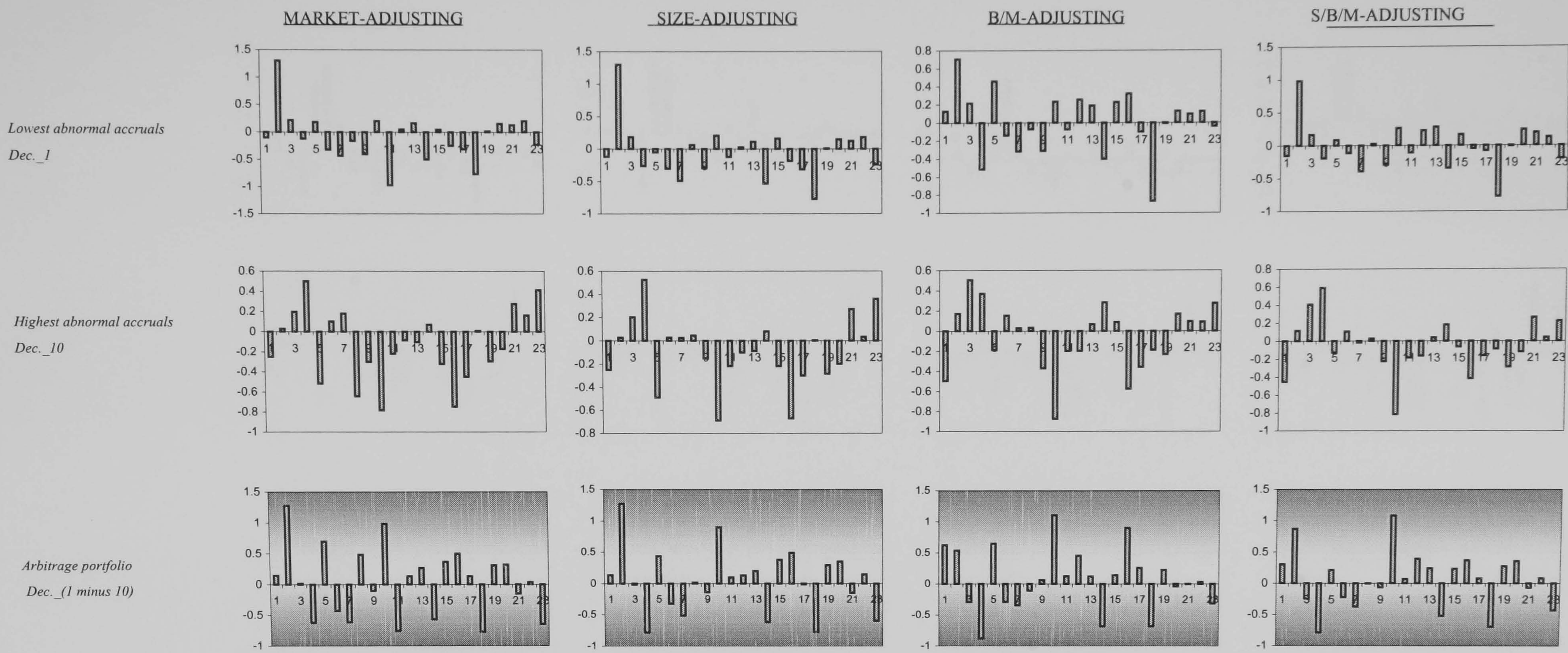


Note that a figure of, say, 1.5 on the vertical axis should be interpreted as excess performance of 150% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

SAMPLE (D): **FIGURE 6.5**

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.

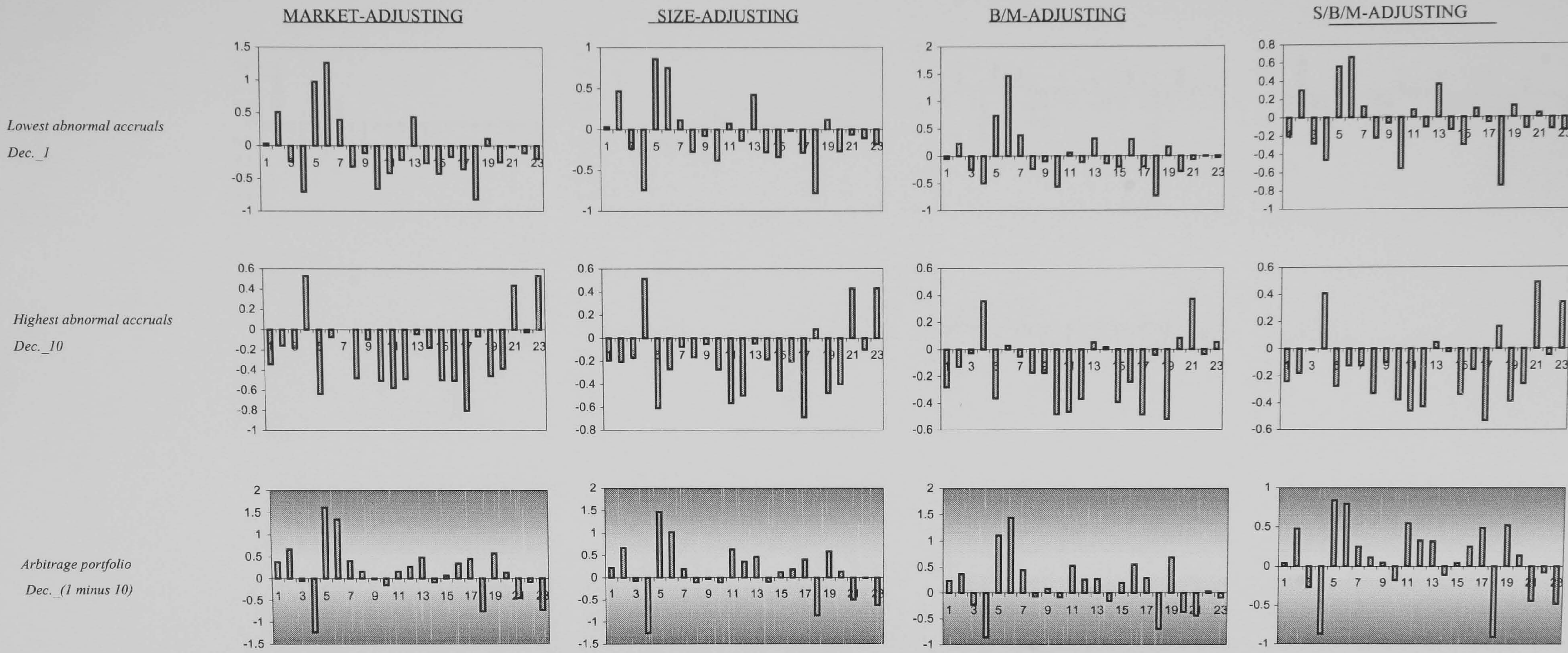


Note that a figure of, say, 1.5 on the vertical axis should be interpreted as excess performance of 150% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

SAMPLE (A+B): FIGURE 6.6

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.



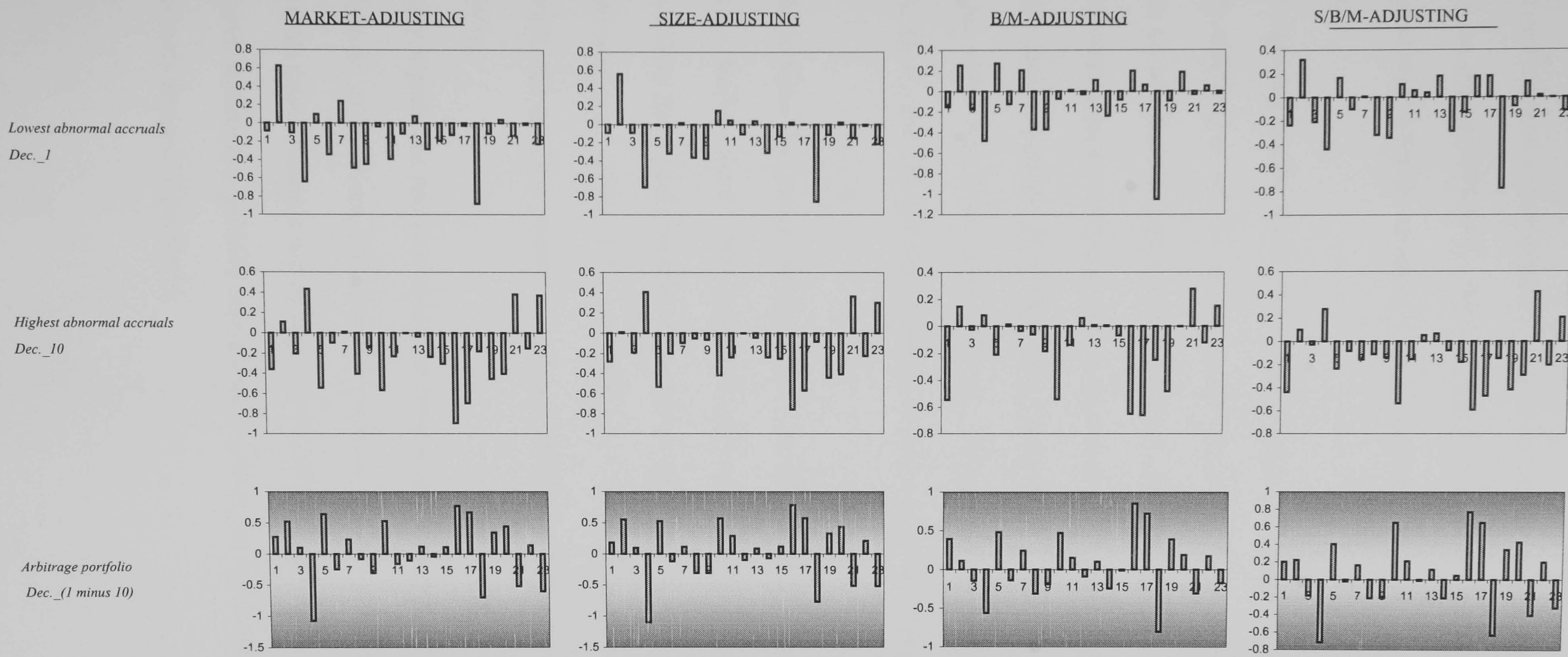
Note that a figure of, say, 1.5 on the vertical axis should be interpreted as excess performance of 150% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

SAMPLE (C+D):

FIGURE 6.7

THE CONSISTENCY ANALYSIS OF ABNORMAL ACCRUALS PERFORMANCE USING (i) MARKET-, (ii) SIZE-, (iii) B/M-, AND (iv) S/B/M-ADJUSTING METHODS

This figure plots abnormal returns for the lowest and highest abnormal accruals deciles (deciles 1 and 10, respectively), and the arbitrage portfolio defined as buying long in decile number 1 and selling short decile 10. Results are accumulated over 36 months as from formation date for each of the 23 portfolio formations. Results of consistency are obtained using the value-weighted basis according to four methods of adjusting sample returns: (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method.



Note that a figure of, say, 0.8 on the vertical axis should be interpreted as excess performance of 80% accumulated over 36 months. Note also that different test periods are presented on the horizontal axis.

6.5 Summary

This chapter examines the performance and consistency of the abnormal accruals anomaly for the UK stock market over the period 1979-2005. Table 6.13 below summarises the average 36-month test period adjusted returns for the samples (A, B, C, and D) and their combinations samples (A+B) and (C+D).

We may be interested in stressing results based on the value-weighted method more than those based on the equally-weighted as we can argue that the value-weighted basis is more appropriate for the samples (as advanced in section 6.3.2.1 of this chapter).

The results in table 6.13 show that there is evidence of abnormal accruals anomaly in the UK stock market over the entire sample periods: (Oct. 1979- Sep. 2004), (Jul. 1980- Jun. 2005), (Jan. 1980- Dec. 2004), (Jul. 1980- Jun. 2005), (Oct. 1979- Jun. 2005), and (Jan. 1980 – Jun. 2005) for all samples (A, B, C, and D) and the combination samples (A+B) and (C+D), respectively.

The value-weighted results indicate that except for samples (C) and (C+D), decile 1 (i.e., the lowest abnormal accruals decile) earns value-weighted adjusted returns statistically undifferentiated from zero. Over three years, sample (C) produces significant market-, size-, B/M-, and S/B/M-adjusted returns of -22%, -21%, and -18% and -15, respectively. Sample (C+D) influenced by sample (C) produces significant market- and size-adjusted returns of -16%, and -13%, respectively.

Observing these statistically significant negative abnormal returns for the lowest abnormal accruals deciles is opposite to expectations. Existing US evidence documents an inverse relation between total accruals (also abnormal accruals) and future returns, e.g., Sloan (1996) and Xie (2001) who observe statistically positive size-adjusted returns for the lowest total accruals, and abnormal accruals deciles, respectively.

TABLE 6.13

SUMMARY RESULTS OF THE 36-MONTH TEST PERIOD ADJUSTED RETURNS OF THE ABNORMAL ACCRUALS ANOMALY FOR SAMPLES (A, B, C, and D) AND THE COMBINATIONS SAMPLES (A+B) AND (C+D).

Returns	Lowest 1	2	....	9	Highest 10	Hedge portfolio
Panel (A): *Sample (A)*						
Equally-Weighted Market-Adjusted Returns	-0.15	-0.08		-0.24**	-0.15	0.01
Equally-Weighted Size-Adjusted Returns	-0.10	0.01		-0.10	-0.06	-0.04
Equally-Weighted B/M-Adjusted Returns	-0.06	-0.04		-0.21**	-0.06	0.00
Value-Weighted Market-Adjusted Returns	0.02	-0.09		-0.21*	-0.26**	0.28
Value-Weighted Size-Adjusted Returns	-0.01	-0.07		-0.13	-0.24**	0.23
Value-Weighted B/M-Adjusted Returns	0.08	0.03		-0.20**	-0.19**	0.27
Value-Weighted S/B/M-Adjusted Returns	-0.03	0.04		-0.16*	-0.19*	0.16
Panel (B): *Sample (B)*						
Equally-Weighted Market-Adjusted Returns	0.00	-0.03		-0.10	-0.19**	0.19
Equally-Weighted Size-Adjusted Returns	0.13	0.10		0.04	-0.05	0.18
Equally-Weighted B/M-Adjusted Returns	0.08	0.01		-0.04	-0.09	0.17
Value-Weighted Market-Adjusted Returns	-0.15	-0.03		-0.18*	-0.18*	0.03
Value-Weighted Size-Adjusted Returns	-0.11	-0.05		-0.19*	-0.12	0.01
Value-Weighted B/M-Adjusted Returns	-0.07	-0.02		-0.15*	-0.10	0.02
Value-Weighted S/B/M-Adjusted Returns	-0.07	-0.05		-0.14*	-0.07	0.00
Panel (C): *Sample (C)*						
Equally-Weighted Market-Adjusted Returns	-0.11	-0.12		-0.21*	-0.20*	0.09
Equally-Weighted Size-Adjusted Returns	-0.03	0.00		-0.09	-0.10	0.07
Equally-Weighted B/M-Adjusted Returns	-0.04	-0.08		-0.16*	-0.11	0.08
Value-Weighted Market-Adjusted Returns	-0.22*	-0.06		-0.13	-0.27**	0.05
Value-Weighted Size-Adjusted Returns	-0.21*	-0.06		-0.08	-0.26**	0.05
Value-Weighted B/M-Adjusted Returns	-0.18*	0.01		-0.10	-0.22**	0.04
Value-Weighted S/B/M-Adjusted Returns	-0.15*	0.02		-0.09	-0.22**	0.08
Panel (D): *Sample (D)*						
Equally-Weighted Market-Adjusted Returns	-0.06	0.09		-0.08	-0.12*	0.06
Equally-Weighted Size-Adjusted Returns	0.06	0.19**		0.03	0.01	0.06
Equally-Weighted B/M-Adjusted Returns	0.02	0.11**		-0.03	-0.06	0.07
Value-Weighted Market-Adjusted Returns	-0.09	-0.03		-0.23**	-0.13	0.04
Value-Weighted Size-Adjusted Returns	-0.05	-0.05		-0.24**	-0.09	0.04
Value-Weighted B/M-Adjusted Returns	0.01	-0.08		-0.13**	-0.06	0.07
Value-Weighted S/B/M-Adjusted Returns	0.00	-0.08		-0.18**	-0.05	0.05
Panel (E): *The Combination of Sample (A+B)*						
Equally-Weighted Market-Adjusted Returns	-0.07	-0.05		-0.17**	-0.17**	0.10
Equally-Weighted Size-Adjusted Returns	0.01	0.06		-0.03	-0.05	0.07
Equally-Weighted B/M-Adjusted Returns	0.01	-0.02		-0,12**	-0.08	0.09
Value-Weighted Market-Adjusted Returns	-0.07	-0.06		-0.20**	-0.22**	0.15
Value-Weighted Size-Adjusted Returns	-0.06	-0.06		-0.16**	-0.18**	0.12
Value-Weighted B/M-Adjusted Returns	0.01	0.00		-0.17**	-0.14**	0.15
Value-Weighted S/B/M-Adjusted Returns	-0.05	-0.01		-0.15**	-0.13*	0.08
Panel (F): *The Combination of Sample (C+D)*						
Equally-Weighted Market-Adjusted Returns	-0.08	-0.01		-0.14**	-0.16**	0.08
Equally-Weighted Size-Adjusted Returns	0.02	0.09*		-0.03	-0.04	0.06
Equally-Weighted B/M-Adjusted Returns	-0.01	0.02		-0.09*	-0.09*	0.07
Value-Weighted Market-Adjusted Returns	-0.16*	-0.05		-0.18**	-0.20**	0.04
Value-Weighted Size-Adjusted Returns	-0.13*	-0.06		-0.16**	-0.17**	0.04
Value-Weighted B/M-Adjusted Returns	-0.09	-0.04		-0.11**	-0.14**	0.06
Value-Weighted S/B/M-Adjusted Returns	-0.07	-0.03		-0.14**	-0.14**	0.06

Note: a figure of, say, -0.15 should be interpreted as abnormal return of -15% accumulated over 36 months.

* Denotes significant at the 0.05 level using a two-tailed t-test. ** Denotes significant at the 0.01 level using a two-tailed t-test.

However, the results of deciles 9 and 10 (i.e., the highest abnormal accruals deciles) are consistent with expectations. In terms of the value-weighted basis, decile 10 in both samples (A) and (C) produce significant negative abnormal returns at the 0.01 level using a two-tailed test for all of the market-, the size-, and the B/M-adjusting tests. Sample (A) produces significant market-, size-, and B/M-adjusted returns of -26%, -24%, and -19%, respectively. Sample (C) produces -27%, -26%, and -22%, respectively, calculated over 3 years. A significant S/B/M-adjusted returns of -19% (at the 5% level) and -22% (at the 1% level) are earned by the same samples, respectively.

Regarding samples (B) and (D), higher negative adjusted returns were earned by decile 9 compared with decile 10. Sample (B) produces significant negative abnormal returns at the 0.05 level using a two-tailed test for the market-, the size-, the B/M- and the S/B/M-adjusting tests of -18%, -19%, -15% and -14%, respectively, measured in terms of value-weighted. Corresponding abnormal returns in sample (D) are significant -23%, -24%, -13% and -18% at the 1% level of significance, respectively.

The sample combinations (A+B) and (C+D) give more insight into the abnormal accruals anomaly. As was mentioned, these two sample combinations are more relevant to estimating the market reaction to the accruals decision as they consider more observations compared with the individual samples [i.e., samples (A, B, C, and D)] without affecting accuracy of the tests because they also match the condition of allowing only six months to start measuring returns as from the shares' financial date.

Samples (A+B) and (C+D) show significant negative abnormal returns at the 0.01 level using a two-tailed test for all of the market-, the size-, and the B/M-adjusting tests for both deciles 9 and 10. Sample (A+B) produces significant value-weighted market-, size-, and B/M-adjusted returns of [-20% and -22%], [-16% and -18%], and [-17% and -14%] for deciles 9 and 10, respectively. Sample (C+D) produces significant value-weighted market-, size-, and B/M-adjusted returns of [-18% and -20%], [-16% and -17%], and [-11% and -14%], respectively. Regarding the S/B/M-adjusting test, sample (A+B) earns -15% (at the 1% level) and -13% (at the 5% level) for deciles 9 and 10, respectively. Corresponding results for sample (C+D) are -14% and -14%, both at the 1% level of significance.

Finally, the consistency analysis of abnormal accruals performance reveals how often abnormal accruals portfolios and hedge portfolio (lowest minus highest abnormal accruals deciles) yield positive excess returns. Results of consistency confirm previous findings regarding the abnormal accruals anomaly but fail to find evidence of sustained negative abnormal returns for the highest abnormal accrual decile over the whole study period, where on three occasions (out of 23) relative high positive adjusted returns were observed.

CHAPTER SEVEN

RESULTS: RISK ANALYSIS OF THE ABNORMAL ACCRUALS ANOMALY

7.1 Introduction

In chapter six four main methods were used to evaluate the market reaction to public information in the form of abnormal accruals. These methods involve adjusting returns of the samples' abnormal accruals deciles by returns on (i) broad market portfolios, (ii) size-control portfolios, (iii) book-to-market (B/M) control portfolios, and (iv) size-and-book-to-market (S/B/M) control portfolios. Results of these methods indicated that the LSE seems to overweight the prospect of the highest abnormal accruals deciles (i.e., deciles 9 and 10). More specifically, these two deciles consistently earn negative abnormal returns during test periods starting six months as from the companies' financial year-ends, mainly when returns are calculated on value-weighted basis.

In this chapter we continue investigating the profitability of the abnormal accruals anomaly by considering another two well-known risk factors that are believed, in the finance literature, to drive share portfolios' normal returns. More precisely, samples' abnormal accruals returns are assessed using (i) the CAPM to estimate (a) Jensen Alpha, and another two applications of the CAPM (introduced by this study, as we are not aware of any other research that has used them before). The first and second proposed applications of the CAPM requires estimating the equivalent of Jensen Alpha but when (b) size-control returns and (c) B/M-control returns, respectively, are used instead of returns on the market as the independent variable in the CAPM equation. (ii) We make use of the Fama and French FF three factor model.

We also investigate percentages of shared shares between the extreme abnormal accruals deciles as they both share relatively similar sizes and produce negative adjusted returns as was shown in chapter six. We do so believing that the observed insignificant negative abnormal returns on the lowest abnormal accruals deciles 1 and 2 (contrary to the ex ante expectation) can be justified, at least in part, if the two extreme deciles are found to share disproportionately more shares than what they share with the rest of the deciles.

The reminder of this chapter is organised as follows. Section 7.2 evaluates the profitability and risk of the abnormal accruals anomaly using the CAPM and the FF three factor models. Section 7.3 conducts a further risk analysis for the abnormal accruals anomaly by investigating percentages of shares' deletions. Section 7.4 looks into percentages of shared shares among the extreme abnormal accruals deciles. Finally, section 7.5 summarises the chapter.

7.2 Profitability of the Abnormal Accruals Anomaly- Continued

As has been mentioned, two main methods are used in this chapter to assess the performance of a sample portfolio. In the first, deciles' returns are adjusted using the CAPM and in the second using the FF three factor model.

Abnormal returns for the abnormal accruals deciles are estimated over periods of 36 months starting 6 months after their financial reporting quarter.

7.2.1 Abnormal Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals Using the CAPM

In this section, sample abnormal accruals deciles' abnormal returns are obtained using three applications of the CAPM. In the first, Jensen Alpha is estimated with returns on the market portfolio as the independent variable in the CAPM regressions. In the second and third applications of the CAPM, returns on size- and B/M-match portfolios are considered as the independent variables in the CAPM instead of returns on the market applied in the first application (i.e., Jensen Alpha), respectively.

Analysis regarding the CAPM is divided into three minor sections. In the first, Jensen Alphas are estimated (i.e., the first application of the CAPM). In the second abnormal returns are estimating through employing size-control returns instead of returns on the market, i.e., by estimating the size-equivalent of Jensen Alpha. In the third, B/M-equivalent of Jensen Alpha is estimated after replacing returns on the market by returns on B/M-control portfolios.

7.2.1.1 Sample Deciles' Abnormal Performance through Estimating Jensen Alpha (the CAPM)

Using this application of the CAPM, a portfolio's abnormal return is referred to as Jensen Alpha (α_p) and obtained by estimating the following regression:

$R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + e$. where: ($R_{pt}$) is the return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t[1].(α_p) is the regression intercept and hypothesised to represent deciles' monthly abnormal returns. (β_p) is the portfolio systematic risk, beta. (R_{mt}) is the month t average returns on a broad market portfolio. And finally (e) is the 'stochastic' or 'random error'.

The following arbitrage portfolio (i.e., Deciles 1 minus 10)) is also estimated for sample deciles: $R_{Lt} - R_{Ht} = \alpha_{L\text{-}H} + \beta_{L\text{-}H} (R_{mt} - R_{ft}) + e$. Where (L)/(H) refers to the lowest and highest abnormal accruals deciles, respectively. Standard deviations σ_p for different deciles are also calculated.

The CAPM-Jensen Alpha is estimated for each decile in each of the samples (A, B, C, and D), (A+B), and (C+D).

Equally- and value-weighted abnormal returns are estimated for sample deciles' based on all monthly return observations over the 23 portfolio formations. Averages of monthly estimated abnormal returns are presented for the three periods (i.e., the first, second and third 12 months) as from formation dates.

Results of the estimated Jensen Alphas are presented in tables 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, and 7.1.6 for the samples (A, B, C, and D), (A+B), and (C+D), respectively. These tables are divided each into two main panels; panel A shows results of the equally-weighted regressions, and panel B shows results of the value-weighted regressions.

[1] As was mentioned in footnote (9) in chapter five, the buy-and-hold risk-free interest rate in the LSPD (2005) file lspdlts, uses the 90-day treasury rate which is annualised. To change these annualised rates into monthly rates we apply the following buy-and-hold conversion equation: Monthly rate= $(1+ \text{annual rate}/100)^{1/12} - 1$.

7.2.1.1.1 Equally-Weighted Sample Deciles' Abnormal Performance through Estimating Jensen Alpha (the CAPM)

Results of estimated Jensen Alpha using the equally-weighted method show that all deciles in all six samples earned significant negative abnormal returns (coloured in red) a total of 15 times. All of them relate to deciles 1, 2, 9, and 10 as follows: four relate to decile 1, one relates to decile 2, four relate to decile 9, and six relate to decile 10.

Regarding the sample combinations A+B and C+D, results of estimated Jensen Alpha using the equally-weighted method are presented in panel A of tables 7.1.5 and 7.1.6, respectively.

Decile number 9 in sample A+B produces insignificant negative abnormal returns over each of the three distinct years following portfolio formations with the highest of -0.326% per month (t-stat. -1,67) over the second year as from portfolio formations. The same decile in sample C+D produces more negative abnormal returns of -0.322% per month (t-stat. -1.92) and statistically significant of -0.318 (t-stat. -2.14) over the second and third years as from formations, respectively.

Decile number 10 in both samples A+B and C+D produces negative abnormal returns of -0.570% per month (t-stat. -3.37) computed over the first 12 months as from portfolio formations for sample (A+B) and of -0.494% per month (t-stat. -3.34) and -0.410% per month (t-stat. -2.57) computed over the first and third 12 months as from portfolio formations, for sample C+D, respectively.

Regarding decile 1 sample A+B produces relatively high, though still insignificant, negative abnormal returns of -0.357% per month (t-stat. -1.88) over the second 12 months as from formation. The same decile in sample C+D produces significant negative abnormal returns of -0.365% per month (t-stat. -2.70) and -0.422% (t-stat. -2.36) over the first and second years as from portfolio formations, respectively.

Decile 2 in sample C+D produces significant positive abnormal returns of 0.328% per month

TABLE 7.1

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, the share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i [1/A_{it-1}] + b_{1i} [(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i} [PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively.
The estimated **CAPM** model is as follows: $\mathbf{R_{pt} - R_{ft} = \alpha_p + \beta_p (R_{mt} - R_{ft}) + e}$.
Where: (R_{pt}) is the average return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t.(α_p) is the regression intercept hypothesised representing deciles' abnormal returns. (β_p) is the portfolio systematic risk beta. (R_{mt}) is the month t average returns on a broad market portfolio. And finally (e) is the 'stochastic' or 'random error'. The following arbitrage portfolio (i.e., deciles.(1 minus 10)) is also estimated for sample portfolios: $\mathbf{R_{Lt} - R_{Ht} = \alpha_{L-H} + \beta_{L-H} (R_{mt} - R_{ft}) + e}$. Where ($_L$) and ($_H$) refer to the lowest and highest abnormal accruals deciles, respectively. Standard deviation σ_p for different deciles are also calculated. The CAPM is also applied to the samples A+B, and C+D. When the CAPM is estimated for sample A+B the first 9 return observations regarding R_{pt}, and R_{mt} come from sample A alone as this sample starts 9 months before sample B, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. Similarly, when the CAPM is estimated for sample C+D the first 6 return observations regarding R_{pt}, and R_{mt} come from sample C alone as this sample starts 6 months before sample D, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. Equally- and value-weighted abnormal returns are estimated for sample deciles' based on all monthly return observations over the 23 portfolio formations. The results of estimating Jensen Alpha are reported per month for the three periods (i.e., the first, second and third 12 months) as from portfolio formations. The following six tables 7.1.1, 7.1.2, 7.1.3, 7.1.4, 7.1.5, and 7.1.6 include the CAPM test results for the samples (A, B, C, and D) and A+B and C+D, respectively. *Estimated abnormal returns -(the first column)- of each of the three distinct periods are presented accompanied with t-statistic (t-), where:*
— *Shows significant negative-adjusted returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red shows significant negative-adjusted returns at 1% two-tailed (critical t- is -2.8).*
— *Shows significant positive-abnormal returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue shows significant positive-abnormal returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 7.1.1

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00455	-1.79	0.98	0.063	-0.00335	-1.27	1.02	0.066	-0.00148	-0.58	1.00	0.064
DEC. 2	0.00041	0.16	1.00	0.065	-0.00311	-1.20	1.04	0.066	0.00077	0.25	0.90	0.067
DEC. 3	0.00055	0.25	0.91	0.057	-0.00114	-0.52	0.91	0.057	0.00073	0.34	0.88	0.055
DEC. 4	0.00266	1.29	0.87	0.054	-0.00026	-0.12	0.93	0.059	-0.00263	-1.17	0.82	0.054
DEC. 5	0.00322	1.41	0.85	0.056	0.00096	0.42	0.91	0.058	-0.00288	-1.14	0.90	0.060
DEC. 6	0.00447	2.11	0.88	0.056	0.00121	0.55	0.86	0.055	0.00083	0.39	0.85	0.054
DEC. 7	-0.00207	-1.03	0.96	0.057	0.00187	0.90	0.83	0.053	-0.00022	-0.09	0.90	0.058
DEC. 8	-0.00108	-0.48	0.92	0.058	-0.00085	-0.33	0.96	0.063	0.00220	0.88	1.02	0.063
DEC. 9	-0.00218	-0.87	0.97	0.063	-0.00563	-2.19	0.98	0.064	-0.00403	-1.39	1.03	0.068
DEC. 10	-0.00612	-2.76	0.98	0.060	0.00021	0.08	0.96	0.064	-0.00261	-1.01	0.95	0.062
DEC(1-10)	0.00157	0.48	0.00	0.054	-0.00356	-1.00	0.06	0.058	0.00114	0.33	0.04	0.057

Note that a figure of, say, α_p= -0.00455 should be interpreted as abnormal return of -0.455% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00250	-0.66	0.93	0.077	-0.00451	-1.21	1.01	0.078	0.00161	0.41	1.10	0.081
DEC. 2	-0.00717	-1.81	1.09	0.084	-0.00308	-0.80	1.05	0.081	-0.00205	-0.51	1.03	0.082
DEC. 3	-0.00101	-0.38	1.08	0.068	0.00668	2.12	0.92	0.068	-0.00203	-0.69	0.95	0.065
DEC. 4	0.00225	0.70	1.03	0.073	-0.00664	-1.88	1.10	0.078	0.00375	0.99	1.07	0.079
DEC. 5	0.00258	0.74	1.00	0.075	0.00290	0.92	0.96	0.069	-0.00446	-1.49	0.96	0.066
DEC. 6	-0.00145	-0.53	0.99	0.065	0.00322	1.01	1.09	0.073	-0.00245	-0.85	0.87	0.062
DEC. 7	-0.00605	-2.06	0.99	0.068	-0.00102	-0.37	0.84	0.060	0.00005	0.02	0.97	0.067
DEC. 8	-0.00418	-1.47	1.06	0.069	0.00120	0.42	0.90	0.064	0.00492	1.50	0.93	0.069
DEC. 9	-0.00067	-0.17	1.15	0.084	-0.00455	-1.24	0.97	0.076	-0.00319	-0.93	0.92	0.070
DEC. 10	-0.00294	-0.88	0.98	0.072	-0.00737	-2.21	1.02	0.073	-0.00251	-0.70	0.87	0.071
DEC(1-10)	0.00045	0.09	-0.05	0.085	0.00287	0.65	-0.02	0.073	0.00412	0.82	0.23	0.083

Note that a figure of, say, α_p= -0.00250 should be interpreted as abnormal return of -0.250% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 7.1.2

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00025	-0.11	1.12	0.066	-0.00433	-1.76	1.07	0.066	-0.00349	-1.24	1.10	0.070
DEC. 2	0.00262	1.25	0.90	0.055	-0.00047	-0.20	1.06	0.064	-0.00059	-0.20	0.91	0.065
DEC. 3	0.00331	1.48	0.99	0.061	-0.00015	-0.07	0.96	0.058	-0.00191	-0.88	0.94	0.057
DEC. 4	-0.00002	-0.01	0.94	0.057	0.00028	0.13	0.89	0.056	-0.00073	-0.36	0.89	0.054
DEC. 5	-0.00143	-0.79	0.96	0.055	0.00130	0.57	0.90	0.057	0.00236	1.17	0.93	0.055
DEC. 6	0.00230	1.16	0.85	0.053	-0.00085	-0.40	0.93	0.057	-0.00066	-0.35	0.92	0.054
DEC. 7	-0.00024	-0.12	0.93	0.055	0.00052	0.25	0.92	0.056	0.00088	0.40	0.89	0.056
DEC. 8	0.00418	1.93	0.95	0.058	0.00008	0.04	0.91	0.056	0.00003	0.01	1.03	0.059
DEC. 9	-0.00355	-1.52	1.03	0.063	-0.00103	-0.40	1.01	0.065	-0.00052	-0.22	1.07	0.064
DEC. 10	-0.00529	-2.32	1.01	0.062	-0.00170	-0.71	1.00	0.063	-0.00387	-1.67	0.95	0.059
DEC(1-10)	0.00503	1.64	0.12	0.051	-0.00263	-0.80	0.07	0.054	0.00038	0.12	0.16	0.053

Note that a figure of, say, α_p= -0.00025 should be interpreted as abnormal return of -0.025% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00105	-0.27	1.08	0.082	-0.00842	-2.82	1.05	0.069	-0.00064	-0.19	1.01	0.072
DEC. 2	-0.00018	-0.07	0.95	0.061	0.00144	0.46	1.04	0.071	-0.00022	-0.07	0.95	0.064
DEC. 3	-0.00215	-0.86	1.07	0.065	0.00151	0.65	1.13	0.065	-0.00248	-0.97	1.15	0.066
DEC. 4	0.00060	0.18	1.03	0.074	-0.00067	-0.24	1.01	0.067	0.00327	0.95	0.84	0.068
DEC. 5	-0.00156	-0.64	1.02	0.063	0.00202	0.71	0.97	0.065	0.00249	0.95	1.09	0.065
DEC. 6	0.00281	0.96	0.95	0.066	0.00586	1.46	1.06	0.083	-0.00448	-1.59	1.07	0.066
DEC. 7	0.00184	0.73	1.10	0.067	0.00124	0.47	1.02	0.065	0.00498	1.77	0.97	0.064
DEC. 8	0.00037	0.16	1.03	0.062	0.00020	0.07	1.05	0.067	-0.00124	-0.54	1.10	0.062
DEC. 9	-0.00530	-1.99	1.19	0.071	-0.00509	-1.91	1.08	0.067	-0.00051	-0.16	1.16	0.074
DEC. 10	0.00105	0.35	1.01	0.069	-0.00558	-1.95	1.09	0.069	-0.00707	-2.19	1.08	0.072
DEC(1-10)	-0.00210	-0.46	0.07	0.076	-0.00284	-0.74	-0.04	0.063	0.00642	1.48	-0.07	0.071

Note that a figure of, say, α_p= -0.00105 should be interpreted as abnormal return of -0.105% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 7.1.3

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00524	-2.50	1.08	0.062	-0.00285	-1.16	1.05	0.065	-0.00047	-0.20	1.05	0.063
DEC. 2	0.00056	0.26	1.06	0.062	-0.00614	-2.79	1.02	0.061	-0.00093	-0.41	0.92	0.057
DEC. 3	0.00095	0.47	0.91	0.055	0.00019	0.10	0.91	0.055	0.00043	0.19	0.92	0.058
DEC. 4	0.00263	1.47	0.81	0.049	0.00067	0.34	0.92	0.056	-0.00069	-0.36	0.80	0.050
DEC. 5	0.00166	0.88	0.90	0.053	0.00046	0.22	0.94	0.058	-0.00267	-1.27	0.90	0.055
DEC. 6	0.00417	2.20	0.86	0.052	0.00085	0.49	0.75	0.047	0.00008	0.05	0.83	0.048
DEC. 7	-0.00196	-1.09	0.94	0.054	0.00244	1.13	0.90	0.057	0.00161	0.71	0.90	0.057
DEC. 8	0.00074	0.38	0.88	0.054	0.00070	0.37	0.99	0.058	-0.00095	-0.48	0.98	0.057
DEC. 9	-0.00226	-1.18	0.99	0.057	-0.00502	-2.17	0.99	0.062	-0.00574	-2.49	1.06	0.063
DEC. 10	-0.00625	-3.05	1.03	0.060	-0.00042	-0.19	0.99	0.061	-0.00454	-1.91	0.99	0.061
DEC(1-10)	0.00101	0.37	0.04	0.044	-0.00242	-0.72	0.06	0.055	0.00407	1.29	0.07	0.051

Note that a figure of, say, α_p= -0.00524 should be interpreted as abnormal return of -0.524% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00518	-1.31	1.07	0.082	-0.00523	-1.27	1.13	0.086	-0.00255	-0.64	1.14	0.083
DEC. 2	-0.00847	-2.69	1.15	0.076	0.00142	0.41	1.16	0.079	-0.00113	-0.36	0.99	0.069
DEC. 3	0.00184	0.65	1.00	0.067	0.00453	1.53	0.91	0.065	-0.00481	-1.54	1.08	0.071
DEC. 4	0.00062	0.23	0.98	0.065	-0.00560	-1.57	1.13	0.079	0.00045	0.16	0.87	0.061
DEC. 5	0.00275	0.94	1.00	0.068	0.00341	1.05	0.99	0.071	-0.00268	-0.80	1.11	0.074
DEC. 6	0.00109	0.40	1.00	0.065	-0.00284	-1.12	0.85	0.058	0.00088	0.34	0.89	0.058
DEC. 7	-0.00420	-1.59	0.96	0.063	-0.00059	-0.23	0.85	0.058	0.00016	0.05	0.90	0.062
DEC. 8	-0.00028	-0.10	1.01	0.065	0.00066	0.22	0.97	0.067	0.00218	0.70	1.03	0.069
DEC. 9	-0.00010	-0.03	1.05	0.070	-0.00714	-2.26	0.96	0.069	0.00066	0.23	0.87	0.061
DEC. 10	-0.00599	-1.90	1.06	0.073	-0.00643	-1.96	1.05	0.073	-0.00377	-1.16	0.95	0.068
DEC(1-10)	0.00081	0.17	0.01	0.079	0.00120	0.24	0.09	0.081	0.00123	0.25	0.19	0.081

Note that a figure of, say, α_p= -0.00518 should be interpreted as abnormal return of -0.518% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (D):

TABLE 7.1.4

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00198	-1.05	1.18	0.065	-0.00534	-2.45	1.12	0.065	-0.00258	-1.04	1.12	0.067
DEC. 2	0.00584	3.06	0.95	0.056	0.00056	0.28	1.09	0.063	-0.00061	-0.26	0.94	0.058
DEC. 3	0.00096	0.51	0.97	0.056	-0.00009	-0.05	0.88	0.052	-0.00135	-0.69	0.94	0.055
DEC. 4	0.00056	0.32	0.98	0.056	-0.00064	-0.36	0.93	0.054	-0.00193	-1.10	0.92	0.053
DEC. 5	0.00011	0.06	0.99	0.057	0.00271	1.41	0.94	0.056	0.00332	1.78	0.96	0.055
DEC. 6	0.00128	0.71	0.89	0.053	0.00106	0.59	0.93	0.054	-0.00129	-0.80	0.93	0.052
DEC. 7	0.00067	0.38	0.94	0.054	0.00100	0.51	0.87	0.053	0.00251	1.25	0.87	0.053
DEC. 8	0.00246	1.29	0.94	0.056	-0.00008	-0.05	0.92	0.053	-0.00177	-1.02	1.00	0.056
DEC. 9	-0.00272	-1.35	1.01	0.059	-0.00156	-0.72	1.04	0.062	-0.00048	-0.25	1.07	0.060
DEC. 10	-0.00370	-1.88	1.00	0.059	-0.00130	-0.66	1.08	0.062	-0.00360	-1.67	1.00	0.059
DEC(1-10)	0.00172	0.62	0.18	0.046	-0.00404	-1.38	0.04	0.048	0.00101	0.34	0.12	0.048

Note that a figure of, say, α_p= -0.00198 should be interpreted as abnormal return of -0.198% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00320	-0.99	1.05	0.073	-0.00419	-1.51	1.02	0.066	0.00255	0.86	0.95	0.065
DEC. 2	0.00116	0.48	0.98	0.061	0.00132	0.49	1.11	0.068	-0.00208	-0.89	1.02	0.060
DEC. 3	-0.00290	-1.29	1.00	0.060	-0.00212	-1.00	1.08	0.061	-0.00236	-1.05	1.10	0.062
DEC. 4	0.00154	0.57	1.01	0.065	-0.00208	-0.81	1.04	0.065	0.00110	0.35	0.88	0.065
DEC. 5	-0.00141	-0.59	0.96	0.060	0.00293	1.18	1.00	0.062	0.00242	1.12	1.01	0.058
DEC. 6	0.00091	0.40	1.04	0.062	0.00161	0.68	1.02	0.062	0.00018	0.08	1.06	0.060
DEC. 7	0.00031	0.13	1.14	0.066	0.00298	1.16	1.00	0.063	0.00325	1.31	0.94	0.059
DEC. 8	-0.00046	-0.17	1.05	0.066	0.00022	0.09	1.04	0.064	-0.00508	-2.24	1.16	0.064
DEC. 9	-0.00510	-2.08	1.16	0.068	-0.00726	-2.84	1.19	0.070	-0.00194	-0.66	1.16	0.071
DEC. 10	0.00178	0.64	1.02	0.066	-0.00289	-1.22	1.07	0.063	-0.00705	-2.41	1.06	0.068
DEC(1-10)	-0.00498	-1.28	0.02	0.064	-0.00131	-0.39	-0.04	0.055	0.00960	2.40	-0.11	0.066

Note that a figure of, say, α_p= -0.00320 should be interpreted as abnormal return of -0.320% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 7.1.5

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00232	-1.39	1.06	0.059	-0.00357	-1.88	1.04	0.060	-0.00226	-1.14	1.06	0.060
DEC. 2	0.00158	0.92	0.95	0.055	-0.00215	-1.24	1.05	0.059	0.00011	0.05	0.91	0.056
DEC. 3	0.00227	1.35	0.95	0.054	-0.00070	-0.44	0.94	0.053	-0.00025	-0.16	0.91	0.051
DEC. 4	0.00093	0.60	0.90	0.051	0.00012	0.07	0.91	0.052	-0.00126	-0.79	0.85	0.048
DEC. 5	0.00056	0.35	0.91	0.051	0.00131	0.75	0.91	0.053	0.00009	0.05	0.92	0.052
DEC. 6	0.00338	2.17	0.87	0.050	0.00003	0.02	0.89	0.051	0.00027	0.18	0.89	0.049
DEC. 7	-0.00149	-0.93	0.95	0.054	0.00101	0.65	0.87	0.050	0.00050	0.30	0.90	0.051
DEC. 8	0.00098	0.59	0.94	0.054	-0.00087	-0.49	0.94	0.054	0.00082	0.49	1.03	0.056
DEC. 9	-0.00300	-1.70	1.00	0.057	-0.00326	-1.67	1.00	0.059	-0.00241	-1.36	1.05	0.058
DEC. 10	-0.00570	-3.37	0.99	0.056	-0.00044	-0.23	0.98	0.057	-0.00327	-1.84	0.96	0.054
DEC(1-10)	0.00338	1.57	0.07	0.036	-0.00313	-1.29	0.06	0.040	0.00101	0.43	0.10	0.039

Note that a figure of, say, α_p= -0.00232 should be interpreted as abnormal return of -0.232% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00241	-0.90	1.00	0.066	-0.00636	-2.76	1.03	0.062	0.00087	0.32	1.05	0.065
DEC. 2	-0.00336	-1.48	1.01	0.062	-0.00080	-0.33	1.05	0.064	-0.00062	-0.24	1.01	0.062
DEC. 3	-0.00200	-1.09	1.07	0.060	0.00433	2.05	1.02	0.060	-0.00167	-0.83	1.06	0.058
DEC. 4	0.00121	0.52	1.03	0.063	-0.00273	-1.19	1.05	0.062	0.00382	1.44	0.97	0.062
DEC. 5	0.00042	0.19	1.01	0.061	0.00297	1.38	0.97	0.058	-0.00059	-0.29	1.02	0.058
DEC. 6	0.00065	0.32	0.98	0.058	0.00445	1.79	1.08	0.065	-0.00358	-1.69	0.97	0.056
DEC. 7	-0.00203	-0.99	1.05	0.061	0.00011	0.06	0.93	0.054	0.00249	1.17	0.97	0.056
DEC. 8	-0.00217	-1.15	1.04	0.059	0.00123	0.63	0.97	0.056	0.00186	0.96	1.01	0.056
DEC. 9	-0.00314	-1.35	1.17	0.068	-0.00468	-2.11	1.03	0.061	-0.00206	-0.82	1.03	0.063
DEC. 10	-0.00120	-0.49	0.98	0.062	-0.00627	-2.83	1.05	0.061	-0.00450	-1.81	0.98	0.061
DEC(1-10)	-0.00121	-0.35	0.01	0.057	-0.00009	-0.03	-0.03	0.048	0.00538	1.59	0.07	0.056

Note that a figure of, say, α_p= -0.00241 should be interpreted as abnormal return of -0.241% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D):

TABLE 7.1.6

ESTIMATED JENSEN ALPHAS (α_p), BETAS (β_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS.
(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE-WEIGHTED METHODS ARE EMPLOYED).

Panel (A): Deciles' estimated Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00365	-2.70	1.13	0.059	-0.00422	-2.36	1.08	0.060	-0.00175	-1.04	1.09	0.059
DEC. 2	0.00328	2.10	1.01	0.056	-0.00278	-1.85	1.06	0.057	-0.00069	-0.41	0.93	0.052
DEC. 3	0.00123	0.84	0.94	0.052	0.00022	0.15	0.90	0.050	-0.00052	-0.33	0.93	0.051
DEC. 4	0.00154	1.12	0.90	0.049	-0.00010	-0.07	0.93	0.051	-0.00106	-0.76	0.86	0.047
DEC. 5	0.00083	0.58	0.95	0.052	0.00174	1.13	0.94	0.052	0.00048	0.33	0.93	0.051
DEC. 6	0.00277	1.88	0.88	0.049	0.00092	0.66	0.84	0.047	-0.00036	-0.28	0.88	0.047
DEC. 7	-0.00073	-0.51	0.94	0.052	0.00169	1.13	0.89	0.050	0.00211	1.34	0.89	0.050
DEC. 8	0.00139	0.95	0.92	0.051	-0.00008	-0.06	0.95	0.052	-0.00144	-1.04	0.99	0.052
DEC. 9	-0.00258	-1.74	1.00	0.055	-0.00322	-1.92	1.02	0.057	-0.00318	-2.14	1.07	0.056
DEC. 10	-0.00494	-3.34	1.02	0.055	-0.00080	-0.54	1.03	0.056	-0.00410	-2.57	1.00	0.054
DEC(1-10)	0.00129	0.67	0.11	0.032	-0.00342	-1.58	0.05	0.036	0.00235	1.11	0.09	0.035

Note that a figure of, say, α_p= -0.00365 should be interpreted as abnormal return of -0.365% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS				SECOND 12 MONTHS				THIRD 12 MONTHS			
DECILE	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p	α_p	t-	β_p	σ_p
DEC. 1	-0.00460	-1.93	1.05	0.064	-0.00451	-1.88	1.08	0.064	0.00021	0.09	1.04	0.062
DEC. 2	-0.00350	-1.83	1.06	0.060	0.00158	0.74	1.14	0.064	-0.00136	-0.66	1.01	0.056
DEC. 3	-0.00027	-0.15	1.01	0.057	0.00157	0.86	0.99	0.055	-0.00317	-1.60	1.09	0.059
DEC. 4	0.00110	0.55	1.00	0.058	-0.00344	-1.57	1.09	0.063	0.00118	0.54	0.88	0.054
DEC. 5	0.00069	0.35	0.99	0.058	0.00345	1.64	1.00	0.058	0.00026	0.13	1.07	0.059
DEC. 6	0.00088	0.47	1.03	0.058	-0.00033	-0.18	0.94	0.053	0.00049	0.30	0.98	0.052
DEC. 7	-0.00199	-1.06	1.04	0.059	0.00111	0.62	0.92	0.052	0.00172	0.88	0.93	0.053
DEC. 8	-0.00068	-0.37	1.02	0.058	0.00071	0.37	1.01	0.057	-0.00135	-0.69	1.09	0.059
DEC. 9	-0.00252	-1.30	1.11	0.062	-0.00684	-3.31	1.08	0.061	-0.00051	-0.23	1.01	0.058
DEC. 10	-0.00222	-0.99	1.03	0.062	-0.00439	-2.17	1.05	0.060	-0.00513	-2.37	1.01	0.058
DEC(1-10)	-0.00237	-0.75	0.02	0.053	-0.00012	-0.04	0.03	0.049	0.00534	1.75	0.03	0.051

Note that a figure of, say, α_p= -0.00460 should be interpreted as abnormal return of -0.460% per month calculated over the first 12 months as from portfolio formation.

(t-stat. 2.10) computed over the first year as from formations.

The arbitrage portfolio did not produce significant abnormal returns on any occasion, and noticeably produces negative as well as positive abnormal returns. E.g., the arbitrage portfolio in samples A+B and C+D produces positive abnormal returns of 0.338% per month (t-stat. 1.57) and negative abnormal returns of -0.342% per month (t-stat. -1.58) computed over the first and second years as from formations for the samples, respectively.

And so, the equally-weighted results of the estimated Jensen Alpha lead to the same conclusions as in chapter six regarding hypothesis testing; the *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns is accepted. The *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted. Finally, the third the *hypothesis* that the arbitrage portfolio produces abnormal returns indistinguishable from zero is accepted.

The estimated loadings on the market factor are close to unity for all ten deciles, with slightly higher loading on the lowest abnormal accruals portfolios compared with the rest of portfolios. Loadings on the market factor for decile 1 in sample A+B are 1.06, 1.04, and 1.06 for the first, second, and third 12 months as from formation date, respectively. The corresponding loadings for decile 10 in the same sample are 0.99, 0.98, and 0.96, respectively. Regarding sample C+D these loadings are 1.13, 1.08, 1.09 for decile 1, and 1.02, 1.03, and 1.00 for decile 10, respectively.

As a matter of fact, this finding challenges observing negative abnormal returns on the extreme abnormal accruals deciles, mainly the lowest abnormal accruals decile 1 that has produced negative adjusted returns for all the tests conducted so far, unless there is no systematic relationship between the market factor loadings and portfolio returns.

Standard deviations of extreme portfolios are slightly higher than the rest of deciles. While estimations of standard deviations for all deciles range from 4.8% to 6.0% for sample A+B, standard deviation of decile 1 is (5.9%, 6.0%, and 6.0%), decile 2 is (5.5%, 5.9%, and 5.6%), decile 9 is (5.7%, 5.9%, and 5.8%), and decile 10 is (5.6%, 5.7%, and 5.4%), all over the first, second, and third year as from portfolio formations, respectively.

Standard deviations of extreme portfolios are also slightly higher than the rest of deciles for sample C+D. While estimations of standard deviations for all deciles range from 4.7% to 6.0% for sample C+D, standard deviation of decile 1 is (5.9%, 6.0%, and 5.9%), decile 2 is (5.6%, 5.7%, and 5.2%), decile 9 is (5.5%, 5.7%, and 5.6%), and decile 10 is (5.5%, 5.6%, and 5.4%), all over the first, second, and third year as from portfolio formation, respectively. Results of the portfolios' estimated standard deviations suggest that the extreme abnormal accruals deciles are probably expected to earn at least as much as the rest of deciles if not more.

We can compare these results with those of Sloan (1996) who created deciles on the basis of total accruals over the period 1962-1991. The results of his estimated Jensen Alpha accompanied with t-statistics using equally-weighted returns over the first, second, and third year as from portfolio formations are as follows (results are per year):

	Sloan (1996). Estimated Jensen alphas 1962-1991.		
Decile No.	year t+1	year t+2	year t+3
Lowest 1	0.039 (2.01)	0.007 (0.40)	0.001 (0.08)
2	0.020 (1.68)	0.022 (1.53)	0.012 (1.06)
9	-0.028 (-3.04)	-0.012 (-1.36)	-0.012 (-1.15)
Highest 10	-0.064 (-4.68)	-0.040 (-2.87)	-0.036 (-2.47)
Hedge portfolio	0.104 (4.42)	0.048 (2.41)	0.038 (1.62)

We observe that the lowest (highest) total accruals decile, in Sloan's study, significantly contributes to excess returns earned by the hedge portfolio over the first year (the first, second, and third year as from portfolio formations), respectively. That is, using the CAPM, Sloan finds evidence that the highest accruals decile is of higher influence than the lowest accruals decile in generating returns on the hedge portfolio.

7.2.1.1.2 Value-Weighted Sample Deciles' Abnormal Performance through Estimating Jensen Alpha (the CAPM)

The value-weighted method for estimating Jensen Alpha reveals that in total there are 16 abnormal accruals portfolios that earned significant negative abnormal returns (in red): 14 of those relate to the four extreme deciles as follows: two relate to decile 1, one relates to decile 2, five relate to decile 9, and six relate to decile 10.

Decile number 9 in sample A+B produces significant negative abnormal returns of -0.468% per month (t-stat. -2.11) over the second year as from portfolio formations. Over the same year, the same decile in sample C+D produces more negative abnormal returns of -0.684% per month (t-stat. -3.31).

Decile number 10 in both samples A+B and C+D produce negative abnormal returns of -0.627% per month (t-stat. -2.83) computed over the second 12 months as from portfolio formations for sample A+B and of -0.439% per month (t-stat. -2.17) and -0.513% per month (t-stat. -2.37) computed over the second and third 12 months, for sample C+D, respectively.

On the other hand, decile 1 in sample A+B produces significant negative abnormal returns of -0.636% per month (t-stat. -2.76) over the second 12. The same decile in sample C+D produces relatively high but insignificant negative abnormal returns of -0.460% per month (t-stat. -1.93) and -0.451% per month (t-stat. -1.88) over the first and second years, respectively.

Deciles 2 in both samples A+B and C+D produce insignificant negative abnormal returns.

The arbitrage portfolio shows low insignificant negative abnormal returns over the first two years as from portfolio formations in both samples A+B and C+D, with relatively high, but insignificant, positive abnormal returns of 0.538% (t-stat. 1.59) and 0.534% (t-stat. 1.75) over the third 12 months as from portfolio formations for both samples, respectively.

And so, the value-weighted estimated Jensen Alpha tests lead to the same conclusions as before; the *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns is accepted. The *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted. Finally, the third *hypothesis* that the arbitrage portfolio produces abnormal returns indistinguishable from zero is accepted.

The estimated loadings on the market factor are close to unity for all ten deciles, with no apparent trends. And so, we are still struggling finding a reason for the extreme abnormal accruals deciles consistently producing negative abnormal returns since the risk factor beta defined as a loading on the market premium is unable to explain abnormal returns on these deciles.

Standard deviations of extreme portfolios are slightly higher than the rest of deciles.

As in the equally-weighted, results of portfolios' estimated standard deviations using value-weighted basis suggest that the extreme abnormal accruals deciles, mainly deciles 1, 9, and 10, should earn at least as much as the rest of deciles.

7.2.1.2 Sample Deciles' Abnormal Performance through Estimating Size-Equivalent Jensen Alphas by Replacing Returns on the Market by Returns on Size-Control Portfolios

The second application of the CAPM requires estimation of the intercept in the following regression:

$$R_{pt} - R_{ft} = S\alpha_p + S\beta_p (R_{st} - R_{ft}) + e.$$

Where: (R_{pt}) is the return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t. ($S\alpha_p$) refers to the size-equivalent of Jensen Alpha, and hypothesised to represent deciles' monthly abnormal returns. ($S\beta_p$) is the portfolio systematic risk relative to the size-control portfolio. (R_{st}) is the month t average returns on size-control portfolios[2]. And finally (e) is the 'stochastic' or 'random error'.

The size-equivalent of Jensen Alpha ($S\alpha_p$) is estimated for each decile in each of the samples (A, B, C, and D), (A+B), and (C+D)[3].

Equally- and value-weighted adjusted returns (i.e., $S\alpha_p$) are estimated for sample deciles' based on all monthly return observations at the one decile level over the 23 portfolio formations.

Averages of monthly estimated abnormal returns are presented for the three periods; the first, second and third 12 months as from formations.

Results of estimated $S\alpha_p$ are presented in tables 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, and 7.2.6 for the samples (A, B, C, and D), (A+B), and (C+D), respectively.

[2] This procedure requires calculating returns on a size-control portfolio for each decile, that is; returns on 230 size-control portfolios are needed to match 230 deciles in each sample over the 23 test periods.

[3] When the size-equivalent of Jensen Alpha is estimated for the sample A+B the first 9 return observations regarding R_{pt}, and R_{st} come from sample A alone, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in a test period. In the same manner, when $S\alpha_p$ is estimated for sample C+D the first 6 return observations regarding R_{pt}, and R_{st} come from sample C, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in a test period.

TABLE 7.2

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, the share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively.

The proposed 'size' application of the CAPM -(as we are not aware of any previous research has adopted the following CAPM methodology)- uses monthly average returns on a size-control portfolio as a regressor instead of R_{mt} in the traditional CAPM. Accordingly, the estimated **CAPM** model will be as follows: $\mathbf{R_{pt} - R_{ft} = S\alpha_p + S\beta_p\,(R_{st} - R_{ft}) + e}$.

Where: (R_{pt}) is the average return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t.($S\alpha_p$) is the size-equivalent of Jensen Alpha; the regression intercept and hypothesised to represent deciles' abnormal returns. ($S\beta_p$) is the portfolio systematic risk beta relative to the size-control portfolios. (R_{st}) is the month t average returns on size-control portfolios. And finally, (e) is the 'stochastic' or 'random error'. Abnormal returns using this method are estimated for each of the above samples and their combinations A+B and C+D. When the CAPM is estimated for sample A+B the first 9 return observations regarding R_{pt}, and R_{st} come from sample A alone as this sample starts 9 months before sample B, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. When the CAPM is estimated for sample C+D the first 6 return observations regarding R_{pt}, and R_{st} come from sample C alone as this sample starts 6 months before sample D, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. Equally- and value-weighted abnormal returns are estimated for sample deciles' based on all monthly return observations over the 23 portfolio formations. The results of estimating size-equivalent of Jensen Alpha are reported per month for the three periods (i.e., the first, second and third 12 months) as from portfolio formations. The following six tables 7.2.1, 7.2.2, 7.2.3, 7.2.4, 7.2.5, and 7.2.6 include the CAPM test results for the samples (A, B, C, and D) and A+B and C+D, respectively. *Estimated abnormal returns -(the first column)- of each of the three distinct periods are presented accompanied with t-statistic (t-), where:*

— *Shows significant negative-abnormal returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red shows significant negative-abnormal returns at 1% two-tailed (critical t- is -2.8).*

— *Shows significant positive-abnormal returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue shows significant positive-abnormal returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 7.2.1

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00278	-1.14	0.97	-0.00194	-0.80	1.02	0.00029	0.12	1.01
DEC. 2	0.00119	0.48	1.01	-0.00131	-0.51	1.01	0.00222	0.77	0.96
DEC. 3	0.00149	0.72	0.93	-0.00013	-0.06	0.92	0.00154	0.72	0.89
DEC. 4	0.00355	1.80	0.89	-0.00002	-0.01	0.91	-0.00076	-0.37	0.88
DEC. 5	0.00331	1.51	0.87	0.00225	1.02	0.87	-0.00213	-0.87	0.87
DEC. 6	0.00528	2.52	0.85	0.00193	0.93	0.87	0.00145	0.73	0.92
DEC. 7	-0.00094	-0.48	0.91	0.00247	1.29	0.87	0.00063	0.29	0.91
DEC. 8	-0.00107	-0.47	0.93	0.00123	0.52	0.98	0.00338	1.40	0.99
DEC. 9	-0.00087	-0.37	0.97	-0.00213	-0.90	1.02	-0.00245	-0.90	1.06
DEC. 10	-0.00402	-1.88	0.97	0.00138	0.54	0.99	-0.00071	-0.29	0.95
DEC(1-10)	0.00124			-0.00331			0.00099		

Note that a figure of, say, $S\alpha_p$= -0.00278 should be interpreted as abnormal return of -0.278% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00317	-0.88	1.00	-0.00436	-1.23	1.03	0.00123	0.33	1.13
DEC. 2	-0.00724	-1.85	1.11	-0.00280	-0.74	1.07	-0.00008	-0.02	1.07
DEC. 3	-0.00101	-0.38	1.06	0.00629	2.01	0.93	-0.00198	-0.70	0.96
DEC. 4	0.00136	0.42	1.02	-0.00726	-2.02	1.04	0.00409	1.07	1.03
DEC. 5	0.00234	0.68	1.00	0.00260	0.84	0.97	-0.00440	-1.53	0.94
DEC. 6	-0.00067	-0.25	1.00	0.00366	1.18	1.06	-0.00253	-0.91	0.88
DEC. 7	-0.00509	-1.78	1.00	-0.00055	-0.21	0.85	0.00078	0.26	0.96
DEC. 8	-0.00406	-1.45	1.06	0.00036	0.13	0.91	0.00452	1.40	0.94
DEC. 9	0.00046	0.12	1.11	-0.00268	-0.76	1.00	-0.00190	-0.59	1.00
DEC. 10	-0.00297	-0.94	1.04	-0.00741	-2.32	1.08	-0.00238	-0.68	0.91
DEC(1-10)	-0.00019			0.00304			0.00362		

Note that a figure of, say, $S\alpha_p$= -0.00317 should be interpreted as abnormal return of -0.317% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 7.2.2

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	0.00239	1.10	1.11	-0.00204	-0.92	1.11	-0.00072	-0.29	1.14
DEC. 2	0.00363	1.82	0.89	0.00185	0.85	1.01	0.00216	0.79	0.94
DEC. 3	0.00554	2.61	0.99	0.00166	0.92	0.98	-0.00072	-0.36	0.95
DEC. 4	0.00202	1.08	0.94	0.00309	1.62	0.92	0.00010	0.05	0.94
DEC. 5	0.00007	0.04	0.96	0.00310	1.49	0.91	0.00400	1.97	0.92
DEC. 6	0.00322	1.73	0.87	0.00164	0.84	0.95	0.00032	0.19	0.93
DEC. 7	0.00134	0.82	0.97	0.00218	1.16	0.96	0.00263	1.32	0.93
DEC. 8	0.00556	2.73	0.98	0.00218	1.12	0.94	0.00109	0.57	1.04
DEC. 9	-0.00135	-0.64	1.05	0.00138	0.60	1.05	0.00156	0.71	1.05
DEC. 10	-0.00251	-1.21	1.03	0.00037	0.16	0.99	-0.00137	-0.65	0.95
DEC(1-10)	0.00490			-0.00241			0.00065		

Note that a figure of, say, $S\alpha_p$= 0.00239 should be interpreted as abnormal return of 0.239% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	0.00160	0.57	1.05	-0.00824	-2.84	1.09	-0.00021	-0.06	1.04
DEC. 2	-0.00043	-0.19	1.01	0.00082	0.28	1.08	-0.00078	-0.29	1.01
DEC. 3	-0.00208	-0.86	1.07	0.00112	0.50	1.16	-0.00238	-0.98	1.17
DEC. 4	0.00035	0.11	1.05	-0.00087	-0.31	1.00	0.00268	0.78	0.87
DEC. 5	-0.00146	-0.60	1.02	0.00157	0.58	1.00	0.00256	0.98	1.08
DEC. 6	0.00275	0.95	0.95	0.00599	1.50	1.06	-0.00492	-1.81	1.08
DEC. 7	0.00150	0.61	1.10	0.00150	0.58	1.03	0.00503	1.81	0.97
DEC. 8	0.00045	0.20	1.04	0.00013	0.05	1.05	-0.00134	-0.59	1.09
DEC. 9	-0.00576	-2.29	1.17	-0.00534	-2.07	1.11	-0.00088	-0.28	1.17
DEC. 10	0.00118	0.41	1.04	-0.00509	-1.91	1.13	-0.00271	-0.85	0.81
DEC(1-10)	0.00043			-0.00315			0.00250		

Note that a figure of, say, $S\alpha_p$= 0.00160 should be interpreted as abnormal return of 0.160% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 7.2.3

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00221	-1.13	1.09	-0.00139	-0.63	1.08	0.00064	0.29	1.06
DEC. 2	0.00192	0.92	1.06	-0.00340	-1.73	1.03	0.00096	0.47	0.95
DEC. 3	0.00135	0.70	0.92	0.00109	0.59	0.94	0.00151	0.67	0.92
DEC. 4	0.00316	1.82	0.81	0.00195	1.03	0.92	0.00093	0.51	0.84
DEC. 5	0.00169	0.92	0.88	0.00184	0.88	0.93	-0.00212	-1.08	0.92
DEC. 6	0.00492	2.82	0.89	0.00248	1.58	0.78	0.00129	0.84	0.86
DEC. 7	-0.00069	-0.41	0.93	0.00358	1.78	0.93	0.00237	1.14	0.94
DEC. 8	0.00143	0.76	0.89	0.00264	1.56	1.02	0.00049	0.26	1.01
DEC. 9	-0.00062	-0.33	0.97	-0.00253	-1.16	0.98	-0.00336	-1.65	1.07
DEC. 10	-0.00386	-1.99	1.02	0.00084	0.40	1.00	-0.00242	-1.08	0.98
DEC(1-10)	0.00165			-0.00223			0.00306		

Note that a figure of, say, $S\alpha_p$= -0.00221 should be interpreted as abnormal return of -0.221% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00529	-1.40	1.14	-0.00520	-1.30	1.14	-0.00221	-0.58	1.20
DEC. 2	-0.00847	-2.74	1.17	0.00124	0.38	1.20	-0.00057	-0.19	1.01
DEC. 3	0.00177	0.62	0.97	0.00457	1.54	0.92	-0.00409	-1.36	1.09
DEC. 4	0.00041	0.15	0.99	-0.00663	-1.88	1.12	0.00073	0.25	0.85
DEC. 5	0.00182	0.64	1.01	0.00297	0.91	0.96	-0.00298	-0.91	1.07
DEC. 6	0.00160	0.59	0.99	-0.00167	-0.68	0.87	0.00119	0.47	0.87
DEC. 7	-0.00376	-1.47	0.97	-0.00058	-0.23	0.86	-0.00024	-0.08	0.89
DEC. 8	-0.00054	-0.21	1.01	0.00061	0.21	0.98	0.00230	0.74	1.02
DEC. 9	0.00118	0.40	1.06	-0.00546	-1.77	0.96	0.00081	0.29	0.88
DEC. 10	-0.00592	-2.00	1.12	-0.00623	-1.97	1.07	-0.00414	-1.32	0.98
DEC(1-10)	0.00062			0.00103			0.00193		

Note that a figure of, say, $S\alpha_p$= -0.00529 should be interpreted as abnormal return of -0.529% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (D):

TABLE 7.2.4

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED).*

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	0.00060	0.33	1.15	-0.00285	-1.36	1.11	0.00010	0.04	1.15
DEC. 2	0.00695	3.81	0.95	0.00245	1.23	1.05	0.00183	0.84	0.93
DEC. 3	0.00272	1.57	0.97	0.00155	1.04	0.92	-0.00006	-0.04	0.96
DEC. 4	0.00239	1.45	0.96	0.00195	1.22	0.96	-0.00092	-0.59	0.94
DEC. 5	0.00151	0.88	1.00	0.00460	2.61	0.95	0.00428	2.38	0.96
DEC. 6	0.00230	1.41	0.92	0.00315	1.93	0.95	0.00023	0.17	0.96
DEC. 7	0.00192	1.29	0.98	0.00243	1.39	0.91	0.00360	1.88	0.88
DEC. 8	0.00394	2.23	0.96	0.00240	1.54	0.94	-0.00037	-0.25	1.04
DEC. 9	-0.00080	-0.47	1.05	0.00031	0.16	1.06	0.00123	0.68	1.07
DEC. 10	-0.00145	-0.80	1.02	0.00081	0.43	1.05	-0.00050	-0.26	1.00
DEC(1-10)	0.00205			-0.00366			0.00060		

Note that a figure of, say, $S\alpha_p$= 0.00060 should be interpreted as abnormal return of 0.060% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00133	-0.57	1.02	-0.00429	-1.60	1.06	0.00322	1.13	1.00
DEC. 2	0.00085	0.36	0.99	0.00056	0.22	1.13	-0.00243	-1.09	1.01
DEC. 3	-0.00295	-1.35	1.00	-0.00224	-1.10	1.11	-0.00245	-1.13	1.11
DEC. 4	0.00147	0.55	1.02	-0.00213	-0.82	1.04	0.00089	0.29	0.89
DEC. 5	-0.00143	-0.60	0.95	0.00268	1.13	1.01	0.00174	0.82	1.02
DEC. 6	0.00086	0.39	1.04	0.00165	0.72	1.03	0.00006	0.03	1.06
DEC. 7	0.00004	0.02	1.13	0.00269	1.06	1.00	0.00297	1.21	0.95
DEC. 8	-0.00037	-0.14	1.07	0.00035	0.14	1.04	-0.00512	-2.29	1.16
DEC. 9	-0.00552	-2.35	1.16	-0.00748	-2.99	1.20	-0.00221	-0.75	1.16
DEC. 10	0.00148	0.56	1.05	-0.00317	-1.40	1.10	-0.00301	-0.99	0.80
DEC(1-10)	-0.00281			-0.00112			0.00622		

Note that a figure of, say, $S\alpha_p$= -0.00133 should be interpreted as abnormal return of -0.133% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 7.2.5

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00033	-0.20	1.06	-0.00165	-0.95	1.05	-0.00012	-0.07	1.08
DEC. 2	0.00243	1.50	0.95	0.00001	0.01	1.02	0.00218	1.07	0.94
DEC. 3	0.00375	2.39	0.96	0.00067	0.48	0.97	0.00062	0.42	0.92
DEC. 4	0.00250	1.72	0.91	0.00169	1.09	0.92	0.00005	0.03	0.90
DEC. 5	0.00122	0.83	0.92	0.00288	1.75	0.90	0.00111	0.70	0.92
DEC. 6	0.00419	2.86	0.87	0.00157	1.10	0.92	0.00103	0.77	0.92
DEC. 7	-0.00027	-0.20	0.96	0.00215	1.59	0.91	0.00170	1.14	0.92
DEC. 8	0.00167	1.04	0.96	0.00148	0.93	0.96	0.00187	1.17	1.02
DEC. 9	-0.00139	-0.88	1.00	-0.00027	-0.16	1.04	-0.00066	-0.39	1.05
DEC. 10	-0.00334	-2.11	0.99	0.00111	0.63	0.99	-0.00096	-0.61	0.96
DEC(1-10)	0.00301			-0.00276			0.00084		

Note that a figure of, say, $S\alpha_p$= -0.00033 should be interpreted as abnormal return of -0.033% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00151	-0.66	1.02	-0.00613	-2.77	1.04	0.00081	0.31	1.10
DEC. 2	-0.00356	-1.69	1.06	-0.00105	-0.45	1.07	0.00012	0.05	1.03
DEC. 3	-0.00202	-1.15	1.07	0.00393	1.92	1.05	-0.00156	-0.80	1.06
DEC. 4	0.00065	0.28	1.03	-0.00319	-1.38	1.03	0.00361	1.37	0.97
DEC. 5	0.00034	0.16	1.01	0.00264	1.25	0.98	-0.00055	-0.28	1.02
DEC. 6	0.00100	0.50	0.98	0.00469	1.94	1.07	-0.00382	-1.88	0.98
DEC. 7	-0.00168	-0.85	1.06	0.00047	0.25	0.94	0.00285	1.37	0.97
DEC. 8	-0.00197	-1.06	1.05	0.00082	0.43	0.97	0.00157	0.82	1.02
DEC. 9	-0.00290	-1.35	1.17	-0.00392	-1.91	1.08	-0.00162	-0.69	1.08
DEC. 10	-0.00111	-0.50	1.04	-0.00628	-3.13	1.10	-0.00235	-0.95	0.92
DEC(1-10)	-0.00040			0.00014			0.00315		

Note that a figure of, say, $S\alpha_p$= -0.00151 should be interpreted as abnormal return of -0.151% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D): **TABLE 7.2.6**

ESTIMATED SIZE-EQUIVALENT OF JENSEN ALPHAS ($S\alpha_p$), RELATED BETAS ($S\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. (*CAPM_REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE EMPLOYED*).

Panel (A): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00094	-0.72	1.12	-0.00229	-1.43	1.10	0.00012	0.08	1.10
DEC. 2	0.00438	2.98	1.02	-0.00036	-0.27	1.04	0.00143	0.94	0.94
DEC. 3	0.00224	1.65	0.94	0.00150	1.20	0.93	0.00072	0.49	0.94
DEC. 4	0.00273	2.13	0.89	0.00189	1.42	0.95	0.00025	0.20	0.89
DEC. 5	0.00141	1.03	0.95	0.00347	2.45	0.95	0.00122	0.89	0.94
DEC. 6	0.00358	2.83	0.91	0.00278	2.30	0.87	0.00095	0.88	0.92
DEC. 7	0.00044	0.35	0.96	0.00302	2.26	0.91	0.00303	2.09	0.91
DEC. 8	0.00244	1.82	0.93	0.00237	2.00	0.98	-0.00005	-0.04	1.02
DEC. 9	-0.00094	-0.72	1.01	-0.00095	-0.62	1.02	-0.00111	-0.82	1.06
DEC. 10	-0.00272	-2.06	1.03	0.00088	0.63	1.02	-0.00147	-1.07	1.00
DEC(1-10)	0.00178			-0.00316			0.00159		

Note that a figure of, say, $S\alpha_p$= -0.00094 should be interpreted as abnormal return of -0.094% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated size-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$	$S\alpha_p$	t-	$S\beta_p$
DEC. 1	-0.00364	-1.76	1.06	-0.00453	-2.00	1.10	0.00071	0.31	1.10
DEC. 2	-0.00386	-2.15	1.08	0.00097	0.49	1.16	-0.00127	-0.67	1.02
DEC. 3	-0.00033	-0.19	1.00	0.00148	0.83	1.01	-0.00282	-1.47	1.09
DEC. 4	0.00094	0.48	1.01	-0.00395	-1.81	1.08	0.00120	0.55	0.88
DEC. 5	0.00028	0.14	0.98	0.00308	1.48	0.99	-0.00028	-0.14	1.06
DEC. 6	0.00110	0.60	1.02	0.00030	0.18	0.95	0.00059	0.37	0.97
DEC. 7	-0.00188	-1.02	1.05	0.00098	0.56	0.93	0.00136	0.72	0.93
DEC. 8	-0.00075	-0.41	1.03	0.00075	0.40	1.01	-0.00131	-0.67	1.09
DEC. 9	-0.00211	-1.14	1.13	-0.00611	-3.12	1.10	-0.00066	-0.32	1.04
DEC. 10	-0.00235	-1.15	1.08	-0.00466	-2.47	1.08	-0.00339	-1.56	0.96
DEC(1-10)	-0.00129			0.00013			0.00410		

Note that a figure of, say, $S\alpha_p$= -0.00364 should be interpreted as abnormal return of -0.364% per month calculated over the first 12 months as from portfolio formation.

7.2.1.2.1 Equally-Weighted Sample Deciles' Abnormal Performance through Estimating Size-equivalent of Jensen Alpha

In general, the results of this test indicate that all deciles tend to produce more positive than negative abnormal returns, with low and insignificant negative adjusted returns for the extreme deciles. This result confirms findings of the equally-weighted size-control adjusted returns in section 6.3.2.1 of chapter six[4].

Using the equally-weighted size-equivalent of Jensen Alpha (CAPM), significant negative abnormal returns were observed on only two occasions. Deciles number 10 in both samples A+B and C+D earn adjusted returns of -0.334% per month (t-stat. -2.11) and -0.272% per month (t-stat. -2.06) over the first12 months, respectively.

Low abnormal returns are evident for the arbitrage portfolio. Statistically, we are unable to confirm results regarding the arbitrage portfolio under this test since we could not perform regressions for that portfolio because each of deciles 1 and 10 has a unique size-control portfolio.

Results of the equally-weighted size-equivalent of Jensen Alpha confirm results of Jensen Alpha as well as all the results before; the *alternative* hypothesis that the highest abnormal accruals deciles produces negative adjusted returns is accepted. The *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted. Finally, we are unable to comment statistically on the third *hypothesis* that the arbitrage portfolio produces abnormal returns indistinguishable from zero as we could not obtain t-test for that portfolio.

The estimated loadings on the size-control factor are close to unity for all ten deciles, and

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[4] Remember that in section 6.3.2.1 we related the observed more positive than negative equally-weighted size-adjusted returns, at least in part, to the fact that original high returns on deletions$^{with\ value}$ are replaced by lower computed on corresponding market-size deciles.

interestingly very close to those of Jensen Alpha under the equally-weighted basis. Decile number one is found to have relatively higher regression slopes than the rest of deciles, with values of 1.06, 1.05, and 1.08 over the first, second and third years as from portfolio formations for sample A+B. Corresponding results for sample C+D are 1.12, 1.10, and 1,10, respectively.

7.2.1.2.2 Value-Weighted Sample Deciles' Abnormal Performance through Estimating Size-equivalent of Jensen Alpha

The estimated size-equivalent of Jensen Alpha results employing the value-weighted method show that all deciles in all six samples earned significant negative abnormal returns (coloured in red) a total of 16 occasions. Of these, 14 times (for purpose of comparability these were 14 out of 16 in Jensen Alpha) relate to deciles 1, 2, 9, and 10 as follows: three relate to decile 1, two relate to decile 2, five relate to decile 9, and four relate to decile 10.

Decile number 9 in sample A+B produces high but insignificant negative abnormal returns of -0.392% per month (t-stat. -1.91) over the second year. Within the same year, the same decile in sample C+D produces significant negative abnormal returns of -0.611% per month (t-stat. -3.12).

As in Jensen alpha, decile number 10 in both samples A+B and C+D, produces negative adjusted returns of -0.628% per month (t-stat. -3.13) and -0.466% per month (t-stat. -2.47) computed over the second 12 months, respectively.

The arbitrage portfolio, produces high positive adjusted returns of 0.315% per month and 0.410% per month for the samples A+B and C+D, respectively, over the third 12 months. Again, statistically, we are unable to confirm if that amount is significantly different than zero or not.

Therefore, the results of the estimated size-equivalent of Jensen Alpha using the value-weighted basis are statistically similar to those of previous tests including the estimated Jensen Alpha itself.

The estimated loadings on the size-control factor using the value-weighted method are (as in the equally-weighted test) close to unity for all ten deciles, with relatively higher amounts for the extreme deciles as follows; considering sample (C+D), decile 1 has value of 1.10 for both years two and three, decile 2 has a value of 1.16 for year two, decile 9 has values of 1.13 and 1.10 for the first and second years, and decile 10 has a value of 1.08 for the first and second years.

7.2.1.3 Sample Deciles' Abnormal Performance through Estimating B/M-Equivalent of Jensen Alpha by Replacing Returns on the Market by Returns on B/M-Control Portfolios

The third application of the CAPM requires the estimation of the intercept in the following regression:

$$R_{pt} - R_{ft} = B/M\alpha_p + B/M\beta_p\ (R_{B/Mt} - R_{ft}) + e.$$

Where: (R_{pt}) is the return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t. ($B/M\alpha_p$) refers to the B/M-equivalent of Jensen Alpha which hypothesised to represent deciles' monthly abnormal returns. ($B/M\beta_p$) is the portfolio systematic risk relative to the B/M-control portfolio. ($R_{B/Mt}$) is the month t average returns on B/M-control portfolios[5]. And finally (e) is the 'stochastic' or 'random error'.

[5] This procedure requires calculating returns on a B/M-control portfolio for each decile, that is; returns on 230 B/M-control portfolios are needed to match 230 deciles in each sample.

The B/M-equivalent of Jensen Alpha (B/Mα_p) is estimated for each decile in each of the samples (A, B, C, and D), (A+B), and (C+D) [6].

Equally- and value-weighted abnormal returns (i.e., B/Mα_p) are estimated for sample deciles' based on all monthly return observations at the one decile level over the 23 portfolio formations. Averages of monthly estimated abnormal returns are presented for three periods; the first, second and third 12 months as from formations.

Results of estimated B/Mα_p are presented in tables 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, and 7.3.6 for the samples (A, B, C, and D), (A+B), and (C+D), respectively.

7.2.1.3.1 Equally-Weighted Sample Deciles' Abnormal Performance through Estimating B/M-equivalent of Jensen Alpha

Using the equally-weighted method, the estimated B/M-equivalent of Jensen Alpha shows that on 12 occasions (out of a total of 13) abnormal accruals deciles 1, 2, 9, and 10 earned significant negative abnormal returns as follows: two relate to decile 1, one relates to decile 2, five relate to decile 9, and four relate to decile 10.

All returns per month, deciles number 9 in both samples A+B and C+D produce significant negative adjusted returns over the first year as from portfolio formations of -0.361% per month (t-stat. -2.44) and -0.323% per month (t-stat. -2.66), respectively.

[6] When the B/M-equivalent of Jensen Alpha is estimated for the sample A+B the first 9 return observations regarding R_{pt}, and $R_{B/Mt}$ come from sample A alone, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. Similarly, when B/Mα_p is estimated for sample C+D the first 6 return observations regarding R_{pt}, and $R_{B/Mt}$ come from sample C, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. For both samples this procedure is applied to each of the three distinct 12-month sub-periods included in a test period.

TABLE 7.3

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS ($B/M\alpha_p$), RELATED BETAS ($B/M\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, the share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively.

The proposed 'book-to-market' application of the CAPM -(as we are not aware of any previous research has adopted the following CAPM methodology)- uses monthly average returns on a B/M-control portfolio as a regressor instead of R_{mt} in the traditional CAPM. Accordingly, the estimated **CAPM** model will be as follows: $\mathbf{R_{pt} - R_{ft} = B/M\alpha_p + B/M\beta_p\,(R_{B/Mt} - R_{ft}) + e}$.

Where: (R_{pt}) is the average return on the decile portfolio in month t. (R_{ft}) is the 30-day risk-free rate of return in month t. ($B/M\alpha_p$) is the B/M-equivalent of Jensen Alpha; the regression intercept and hypothesised to represent deciles' abnormal returns. ($B/M\beta_p$) is the portfolio systematic risk beta relative to the B/M-control portfolios. ($R_{B/Mt}$) is the month t average returns on B/M-control portfolios. And finally, (e) is the 'stochastic' or 'random error'. Abnormal returns using this method are estimated for each of the above samples and their combinations A+B and C+D. When the CAPM is estimated for sample A+B the first 9 return observations regarding R_{pt}, and $R_{B/Mt}$ come from sample A alone as this sample starts 9 months before sample B, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. When the CAPM is estimated for sample C+D the first 6 return observations regarding R_{pt}, and $R_{B/Mt}$ come from sample C alone as this sample starts 6 months before sample D, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. Equally- and value-weighted abnormal returns are estimated for sample deciles' based on all monthly return observations over the 23 portfolio formations. The results of estimating B/M-equivalent of Jensen Alpha are per month for the three periods (i.e., the first, second and third 12 months) as from portfolio formations. The following six tables 7.3.1, 7.3.2, 7.3.3, 7.3.4, 7.3.5, and 7.3.6 include the CAPM test results for the samples (A, B, C, and D) and A+B and C+D, respectively. *Estimated abnormal returns -(the first column)- of each of the three distinct periods are presented accompanied with t-statistic (t-), where:*

- — *Shows significant negative-abnormal returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red shows significant negative-abnormal returns at 1% two-tailed (critical t- is -2.8).*
- — *Shows significant positive-abnormal returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue shows significant positive-abnormal returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 7.3.1

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS (B/Mα_p), RELATED BETAS (B/Mβ_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p
DEC. 1	-0.00306	-1.29	1.02	-0.00238	-1.01	1.08	-0.00025	-0.10	1.04
DEC. 2	-0.00095	-0.41	1.08	-0.00249	-0.94	1.03	0.00145	0.50	0.95
DEC. 3	-0.00054	-0.27	0.98	-0.00098	-0.48	0.94	0.00126	0.62	0.94
DEC. 4	0.00172	0.88	0.90	-0.00142	-0.66	0.98	-0.00214	-1.06	0.87
DEC. 5	0.00112	0.55	0.94	0.00005	0.03	0.99	-0.00321	-1.47	1.00
DEC. 6	0.00329	1.69	0.94	-0.00052	-0.25	0.89	0.00047	0.23	0.89
DEC. 7	-0.00224	-1.25	0.99	0.00093	0.49	0.89	-0.00051	-0.24	0.95
DEC. 8	-0.00153	-0.70	0.97	-0.00043	-0.19	1.03	0.00249	1.06	1.04
DEC. 9	-0.00304	-1.33	1.02	-0.00476	-2.00	1.01	-0.00396	-1.47	1.11
DEC. 10	-0.00467	-2.19	0.98	0.00044	0.18	1.03	-0.00045	-0.19	0.94
DEC(1-10)	0.00161			-0.00282			0.00020		

Note that a figure of, say, B/Mα_p= -0.00306 should be interpreted as abnormal return of -0.306% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p
DEC. 1	0.00059	0.20	1.01	-0.00311	-1.08	1.05	0.00044	0.13	1.03
DEC. 2	-0.00372	-1.13	1.06	-0.00283	-0.80	1.00	0.00154	0.40	0.91
DEC. 3	0.00074	0.36	0.98	0.00450	1.79	0.97	-0.00179	-0.77	1.02
DEC. 4	0.00109	0.42	1.06	-0.00281	-0.93	1.06	0.00281	0.88	1.09
DEC. 5	0.00261	0.97	1.08	0.00271	1.08	1.02	-0.00506	-1.93	0.97
DEC. 6	0.00179	0.73	0.95	0.00405	1.41	1.02	-0.00187	-0.75	0.93
DEC. 7	-0.00478	-1.95	0.97	-0.00093	-0.40	0.92	-0.00141	-0.56	1.06
DEC. 8	-0.00292	-1.23	1.02	0.00061	0.27	0.96	0.00316	1.14	1.03
DEC. 9	-0.00184	-0.58	1.19	-0.00511	-1.52	0.94	-0.00151	-0.47	0.84
DEC. 10	-0.00362	-1.27	1.00	-0.00557	-1.94	0.98	-0.00028	-0.09	0.88
DEC(1-10)	0.00421			0.00246			0.00072		

Note that a figure of, say, B/Mα_p= 0.00059 should be interpreted as abnormal return of 0.059% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (B):

TABLE 7.3.2

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS (B/Mα_p), RELATED BETAS (B/Mβ_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p
DEC. 1	0.00046	0.22	1.12	-0.00333	-1.56	1.14	-0.00125	-0.54	1.17
DEC. 2	0.00155	0.86	0.96	0.00046	0.22	1.10	-0.00013	-0.05	1.00
DEC. 3	0.00224	1.17	1.07	-0.00123	-0.71	1.03	-0.00219	-1.15	1.02
DEC. 4	-0.00014	-0.08	0.99	0.00140	0.74	0.91	-0.00030	-0.17	0.92
DEC. 5	-0.00329	-2.06	1.02	0.00096	0.51	0.98	0.00299	1.50	0.95
DEC. 6	0.00067	0.38	0.90	-0.00198	-1.10	1.00	-0.00025	-0.16	0.97
DEC. 7	-0.00087	-0.53	0.99	-0.00001	0.00	0.98	0.00094	0.49	0.96
DEC. 8	0.00290	1.59	1.03	-0.00062	-0.34	0.99	-0.00055	-0.32	1.09
DEC. 9	-0.00415	-2.03	1.11	-0.00049	-0.22	1.09	0.00105	0.49	1.09
DEC. 10	-0.00378	-1.94	1.06	-0.00059	-0.28	1.06	-0.00226	-1.09	0.97
DEC(1-10)	0.00424			-0.00274			0.00101		

Note that a figure of, say,B/Mα_p= 0.00046 should be interpreted as abnormal return of 0.046% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p	B/Mα_p	t-	B/Mβ_p
DEC. 1	0.00237	0.93	1.05	-0.00642	-2.67	1.04	-0.00138	-0.45	0.99
DEC. 2	-0.00039	-0.20	1.01	0.00066	0.24	1.05	-0.00044	-0.19	1.09
DEC. 3	0.00075	0.36	1.04	-0.00049	-0.25	1.11	-0.00310	-1.34	1.10
DEC. 4	0.00209	0.79	1.13	-0.00024	-0.10	1.01	0.00259	0.98	0.99
DEC. 5	-0.00205	-1.23	1.10	-0.00075	-0.38	1.08	0.00004	0.02	1.12
DEC. 6	0.00237	1.02	1.04	0.00271	0.92	1.17	-0.00383	-1.79	1.09
DEC. 7	0.00061	0.31	1.14	0.00087	0.39	0.99	0.00320	1.39	1.06
DEC. 8	0.00191	0.97	0.99	0.00074	0.36	1.03	-0.00067	-0.35	1.01
DEC. 9	-0.00454	-2.02	1.14	-0.00391	-1.76	1.07	0.00016	0.05	1.10
DEC. 10	0.00037	0.14	0.97	-0.00299	-1.13	1.00	-0.00251	-0.83	0.81
DEC(1-10)	0.00201			-0.00343			0.00114		

Note that a figure of, say,B/Mα_p= 0.00237 should be interpreted as abnormal return of 0.237% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C):

TABLE 7.3.3

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS ($B/M\alpha_p$), RELATED BETAS ($B/M\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	-0.00359	-1.78	1.08	-0.00235	-1.06	1.10	0.00075	0.35	1.08
DEC. 2	0.00037	0.18	1.07	-0.00517	-2.60	1.04	-0.00019	-0.09	0.94
DEC. 3	0.00007	0.04	0.96	0.00000	0.00	0.93	0.00109	0.49	0.95
DEC. 4	0.00151	0.91	0.85	0.00008	0.04	0.99	-0.00095	-0.54	0.87
DEC. 5	-0.00037	-0.21	0.94	-0.00027	-0.14	1.02	-0.00241	-1.26	0.99
DEC. 6	0.00298	1.79	0.92	-0.00010	-0.07	0.83	-0.00062	-0.40	0.87
DEC. 7	-0.00246	-1.47	0.96	0.00127	0.65	0.96	0.00190	0.92	0.97
DEC. 8	0.00021	0.11	0.92	0.00175	1.02	1.02	-0.00019	-0.10	1.01
DEC. 9	-0.00301	-1.68	1.01	-0.00380	-1.74	1.02	-0.00439	-2.15	1.10
DEC. 10	-0.00540	-2.79	1.03	-0.00001	-0.01	1.02	-0.00197	-0.89	0.99
DEC(1-10)	0.00181			-0.00233			0.00272		

Note that a figure of, say, $B/M\alpha_p$= -0.00359 should be interpreted as abnormal return of -0.359% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	-0.00566	-2.15	1.10	-0.00371	-1.15	1.09	-0.00012	-0.04	1.10
DEC. 2	-0.00439	-1.43	1.04	0.00235	0.73	1.04	0.00130	0.46	0.96
DEC. 3	0.00372	1.55	0.97	0.00393	1.53	0.89	-0.00414	-1.53	1.04
DEC. 4	0.00173	0.70	0.98	-0.00472	-1.41	1.11	0.00082	0.33	0.91
DEC. 5	0.00394	1.65	1.00	0.00228	0.88	1.01	-0.00209	-0.81	1.14
DEC. 6	0.00163	0.70	1.01	-0.00237	-1.13	0.94	-0.00050	-0.24	0.98
DEC. 7	-0.00283	-1.33	0.96	-0.00061	-0.27	0.88	0.00056	0.23	0.96
DEC. 8	0.00075	0.34	0.93	0.00048	0.20	0.98	0.00191	0.79	1.00
DEC. 9	-0.00067	-0.26	1.00	-0.00441	-1.62	0.94	0.00073	0.30	0.89
DEC. 10	-0.00615	-2.22	1.03	-0.00372	-1.31	1.00	-0.00273	-0.91	0.90
DEC(1-10)	0.00049			0.00001			0.00261		

Note that a figure of, say, $B/M\alpha_p$= -0.00566 should be interpreted as abnormal return of -0.566% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (D):

TABLE 7.3.4

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS (B/Mα_p), RELATED BETAS (B/Mβ_p), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

DECILE	FIRST 12 MONTHS B/Mα_p	t-	B/Mβ_p	SECOND 12 MONTHS B/Mα_p	t-	B/Mβ_p	THIRD 12 MONTHS B/Mα_p	t-	B/Mβ_p
DEC. 1	-0.00062	-0.33	1.14	-0.00430	-2.26	1.15	-0.00101	-0.48	1.16
DEC. 2	0.00504	3.07	1.00	0.00042	0.23	1.12	0.00043	0.21	1.00
DEC. 3	0.00003	0.02	1.04	-0.00090	-0.60	0.95	-0.00172	-1.02	1.01
DEC. 4	-0.00018	-0.12	1.02	0.00029	0.19	0.98	-0.00127	-0.84	0.95
DEC. 5	-0.00202	-1.24	1.05	0.00216	1.35	1.01	0.00277	1.56	1.00
DEC. 6	-0.00025	-0.16	0.93	-0.00022	-0.15	0.99	-0.00084	-0.61	0.98
DEC. 7	-0.00012	-0.08	1.00	0.00054	0.32	0.94	0.00232	1.31	0.95
DEC. 8	0.00135	0.84	1.01	-0.00063	-0.42	0.99	-0.00180	-1.22	1.06
DEC. 9	-0.00329	-1.93	1.07	-0.00081	-0.44	1.11	0.00070	0.40	1.08
DEC. 10	-0.00323	-1.96	1.06	-0.00042	-0.23	1.11	-0.00184	-0.97	1.02
DEC(1-10)	0.00261			-0.00388			0.00083		

Note that a figure of, say,B/Mα_p= -0.00062 should be interpreted as abnormal return of -0.062% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

DECILE	FIRST 12 MONTHS B/Mα_p	t-	B/Mβ_p	SECOND 12 MONTHS B/Mα_p	t-	B/Mβ_p	THIRD 12 MONTHS B/Mα_p	t-	B/Mβ_p
DEC. 1	0.00089	0.42	1.01	-0.00188	-0.85	1.02	0.00142	0.57	0.97
DEC. 2	0.00014	0.07	1.04	-0.00135	-0.59	1.13	-0.00248	-1.26	1.08
DEC. 3	-0.00111	-0.56	0.95	-0.00220	-1.26	1.05	-0.00339	-1.59	1.04
DEC. 4	0.00191	0.98	1.08	-0.00194	-0.96	1.02	0.00180	0.80	1.03
DEC. 5	-0.00157	-1.04	1.07	0.00018	0.11	1.07	-0.00023	-0.14	1.08
DEC. 6	0.00088	0.50	1.05	0.00239	1.23	1.00	-0.00022	-0.13	1.07
DEC. 7	0.00116	0.64	1.14	0.00165	0.88	1.06	0.00226	1.18	1.04
DEC. 8	0.00015	0.07	1.13	-0.00094	-0.52	1.10	-0.00394	-2.33	1.14
DEC. 9	-0.00275	-1.42	1.10	-0.00415	-1.89	1.09	0.00000	0.00	1.10
DEC. 10	0.00118	0.51	1.00	-0.00177	-0.83	1.00	-0.00232	-0.81	0.83
DEC(1-10)	-0.00028			-0.00010			0.00373		

Note that a figure of, say,B/Mα_p= 0.00089 should be interpreted as abnormal return of 0.089% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (A+B):

TABLE 7.3.5

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS ($B/M\alpha_p$), RELATED BETAS ($B/M\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	-0.00120	-0.77	1.08	-0.00256	-1.56	1.10	-0.00069	-0.42	1.11
DEC. 2	0.00049	0.35	1.02	-0.00129	-0.76	1.07	0.00067	0.34	0.96
DEC. 3	0.00127	0.94	1.03	-0.00103	-0.77	1.00	-0.00025	-0.18	0.98
DEC. 4	0.00064	0.47	0.94	0.00015	0.10	0.95	-0.00087	-0.65	0.90
DEC. 5	-0.00115	-0.91	0.98	0.00058	0.42	1.00	0.00010	0.07	0.99
DEC. 6	0.00204	1.57	0.93	-0.00143	-1.05	0.95	0.00031	0.23	0.93
DEC. 7	-0.00180	-1.38	1.00	0.00029	0.22	0.94	0.00034	0.24	0.96
DEC. 8	0.00038	0.27	1.00	-0.00069	-0.46	1.01	0.00068	0.46	1.07
DEC. 9	-0.00361	-2.44	1.06	-0.00243	-1.46	1.06	-0.00161	-0.95	1.09
DEC. 10	-0.00414	-2.91	1.03	0.00022	0.13	1.05	-0.00126	-0.81	0.97
DEC(1-10)	0.00294			-0.00278			0.00057		

Note that a figure of, say, $B/M\alpha_p$= -0.00120 should be interpreted as abnormal return of -0.120% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
DECILE	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	0.00096	0.50	1.03	-0.00455	-2.50	1.02	-0.00040	-0.17	1.03
DEC. 2	-0.00165	-0.90	1.00	-0.00132	-0.62	1.04	0.00077	0.34	1.01
DEC. 3	0.00032	0.23	1.00	0.00192	1.17	1.04	-0.00233	-1.40	1.07
DEC. 4	0.00182	1.00	1.05	-0.00134	-0.77	1.04	0.00292	1.41	1.02
DEC. 5	0.00064	0.41	1.07	0.00127	0.79	1.02	-0.00225	-1.36	1.04
DEC. 6	0.00227	1.35	0.99	0.00343	1.80	1.08	-0.00287	-1.76	1.02
DEC. 7	-0.00175	-1.10	1.04	-0.00036	-0.22	0.95	0.00060	0.36	1.07
DEC. 8	-0.00052	-0.33	1.01	0.00112	0.71	0.97	0.00123	0.77	1.00
DEC. 9	-0.00301	-1.57	1.16	-0.00456	-2.39	1.02	-0.00101	-0.46	1.01
DEC. 10	-0.00165	-0.82	0.98	-0.00434	-2.21	0.99	-0.00142	-0.69	0.94
DEC(1-10)	0.00261			-0.00021			0.00102		

Note that a figure of, say, $B/M\alpha_p$= 0.00096 should be interpreted as abnormal return of 0.096% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D):

TABLE 7.3.6

ESTIMATED BOOK-TO-MARKET-EQUIVALENT OF JENSEN ALPHAS ($B/M\alpha_p$), RELATED BETAS ($B/M\beta_p$), AND STANDARD DEVIATIONS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(CAPM REGRESSIONS ARE BASED ON ALL THE MONTHLY OBSERVATIONS FOR A PORTFOLIO, EMPLOYING ALL 23 TEST PERIODS. EQUALLY- AND VALUE- WEIGHTED METHODS ARE USED).*

Panel (A): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using equally-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	-0.00215	-1.55	1.12	-0.00349	-2.33	1.13	-0.00032	-0.22	1.12
DEC. 2	0.00281	2.07	1.04	-0.00218	-1.64	1.08	0.00016	0.11	0.97
DEC. 3	0.00034	0.29	1.00	-0.00027	-0.22	0.95	-0.00032	-0.22	0.98
DEC. 4	0.00068	0.61	0.94	0.00015	0.13	0.99	-0.00091	-0.76	0.91
DEC. 5	-0.00118	-0.95	1.00	0.00126	1.07	1.02	0.00033	0.25	1.00
DEC. 6	0.00140	1.21	0.94	-0.00014	-0.13	0.91	-0.00050	-0.47	0.93
DEC. 7	-0.00141	-1.19	0.98	0.00102	0.79	0.94	0.00218	1.62	0.96
DEC. 8	0.00055	0.46	0.97	0.00045	0.40	1.01	-0.00108	-0.95	1.04
DEC. 9	-0.00323	-2.66	1.05	-0.00211	-1.44	1.07	-0.00184	-1.41	1.09
DEC. 10	-0.00427	-3.49	1.05	-0.00012	-0.09	1.06	-0.00184	-1.35	1.01
DEC(1-10)	0.00213			-0.00337			0.00152		

Note that a figure of, say, $B/M\alpha_p$= -0.00215 should be interpreted as abnormal return of -0.215% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Deciles' estimated B/M-equivalent of Jensen Alphas-CAPM using value-weighted basis.

DECILE	FIRST 12 MONTHS			SECOND 12 MONTHS			THIRD 12 MONTHS		
	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$	$B/M\alpha_p$	t-	$B/M\beta_p$
DEC. 1	-0.00248	-1.50	1.03	-0.00256	-1.32	1.03	0.00039	0.19	1.05
DEC. 2	-0.00187	-1.06	1.04	0.00046	0.24	1.08	-0.00046	-0.27	1.03
DEC. 3	0.00142	0.94	0.97	0.00104	0.68	0.97	-0.00364	-2.08	1.05
DEC. 4	0.00188	1.16	1.01	-0.00328	-1.72	1.06	0.00159	0.89	0.94
DEC. 5	0.00132	0.95	1.03	0.00148	0.98	1.02	-0.00102	-0.67	1.10
DEC. 6	0.00117	0.80	1.02	-0.00003	-0.02	0.97	-0.00041	-0.32	1.01
DEC. 7	-0.00091	-0.63	1.05	0.00051	0.34	0.94	0.00145	0.93	0.98
DEC. 8	0.00027	0.18	1.02	0.00006	0.04	1.03	-0.00099	-0.66	1.05
DEC. 9	-0.00169	-1.10	1.05	-0.00415	-2.43	1.02	0.00022	0.12	1.00
DEC. 10	-0.00259	-1.41	1.01	-0.00286	-1.67	1.01	-0.00250	-1.25	0.94
DEC(1-10)	0.00011			0.00030			0.00289		

Note that a figure of, say, $B/M\alpha_p$= -0.00248 should be interpreted as abnormal return of -0.248% per month calculated over the first 12 months as from portfolio formation.

Decile number 10 in both samples A+B and C+D produces negative adjusted returns of -0.414% per month (t-stat. -2.91) and -0.427% per month (t-stat. -3.49) both computed over the first 12 months, respectively.

On the other hand, decile 1 in sample C+D produces significant negative abnormal returns of -0.349% per month (t-stat. -2.33) over the second 12 months.

It is worth pointing that decile 2 in sample C+D produces significant positive abnormal returns of 0.281% per month (t-stat. 2.07) over the first year. Note that comparable abnormal returns for that decile using Jensen Alpha is 0.328% per month (t-stat. 2.10), and using the size-equivalent of Jensen Alpha is 0.438% per month (t-stat. 2.98).

Low abnormal returns are observed for the arbitrage portfolio. Statistically, we are unable of confirming results regarding the arbitrage portfolio under this test since we could not perform regressions for that portfolio because each of deciles 1 and 10 has a unique B/M-control portfolio.

The arbitrage portfolio produces conflicting results between the first two years. In the first year, the arbitrage portfolio earns positive 0.294% and 0.213% per month for the samples A+B and C+D, respectively. Over the second year the same portfolio earns negative abnormal returns of -0.278% and -0.337% per month, respectively.

In conclusion, the equally-weighted results of the estimated B/M equivalent of Jensen alpha accept the *alternative* hypothesis that the highest abnormal accruals deciles produce negative adjusted returns. Also, the *hypothesis* that the lowest abnormal accruals decile produces adjusted returns undifferentiated from zero is accepted.

The estimated loadings on the equally-weighted B/M-control factor are close to unity for all ten deciles. Relatively high regression slopes can be observed for the extreme portfolios, mainly the lowest abnormal accruals decile number 1. Decile number 1 in sample (C+D) loads on the equally-weighted B/M-control factor by 1.12, 1.13, and 1.12 over the first, second, and third years as from portfolio formations. [Comparable results using Jensen alpha are (1.13, 1.08, and1.09), and of (1.12, 1.10, and 1.10) using the size-equivalent of Jensen Alpha].

7.2.1.3.2 Value-Weighted Sample Deciles' Abnormal Performance through Estimating B/M-equivalent of Jensen Alpha

Using the value-weighted method, the estimated B/M-equivalent of Jensen Alpha shows that on 8 occasions (out of a total of 10) abnormal accruals deciles number 1, 9, and 10 earned significant negative adjusted returns as follows: three relate to decile 1, three relate to decile 9, and two relate to decile 10.

Deciles number 9 in both samples A+B and C+D produce significant negative abnormal returns over the second year as from formations of -0.456% per month (t-stat. -2.39) and -0.415% per month (t-stat. -2.43), respectively.

Decile number 10 in sample A+B produces negative adjusted returns of -0.434% per month (t-stat. -2.21) computed over the second 12 months.

Decile 1 in sample A+B produces significant negative adjusted returns of -0.455% per month (t-stat. -2.50) over the second 12 months.

On the other hand, deciles 1, 2, and 10 in sample (C+D) produce abnormal returns that statistically are not different than zero.

In general, low positive abnormal returns are observed on the arbitrage portfolio. Statistically, we are unable to confirm if abnormal returns of the arbitrage portfolio are significantly different than zero or not since we could not perform regressions for that portfolio.

In conclusion, as in all of previous tests, the value-weighted results of the estimated B/M-equivalent of Jensen Alpha accepts the *alternative* hypothesis that the highest abnormal accruals deciles produces negative adjusted returns as well as the *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns indistinguishable from zero.

Finally, the estimated loadings on the value-weighted B/M-control factor are close to unity for all ten deciles.

7.2.2 Abnormal Returns for Sample Portfolios Formed on the Basis of Estimated Abnormal Accruals Using the Fama and French (FF) Three Factor Model

The estimated FF model is as follows: $R_{pt} - R_{ft} = \alpha_p + b_p (R_{mt} - R_{ft}) + s_p(SMB_t) + h_p(HML_t) + e_p$. Where: R_{pt} is the return on the decile portfolio in month t. R_{ft} is the 30-day risk-free rate of return in month t. α_p is the abnormal performance for portfolio p estimated on monthly basis. b_p is the systematic measure of risk. $(R_{mt} - R_{ft})$ is the month t return premium on the market portfolio m. S_p is the slope or factor sensitivity in (SMB_t). SMB_t is the month t difference between the return on a portfolio of small shares (the smallest 50% of shares in a market portfolio) and the return on a portfolio of big market capitalisations (the biggest 50% of shares in the market portfolio). H_p is the slope or factor sensitivity in (HML_t). HML_t is the month t difference between a portfolio of high B/M shares (the highest 32% of B/M shares) and the return on a portfolio of low B/M shares (the lowest 32% of B/M shares). And finally (e_p) is the 'stochastic' or 'random error'.

The following FF arbitrage portfolio (i.e., Decile 1 minus decile 10) is also estimated for sample deciles: $R_{Lt} - R_{Ht} = \alpha_{L\text{-}H} + b_{L\text{-}H} (R_{mt} - R_{ft}) + s_{L\text{-}H}(SMB_t) + h_{L\text{-}H}(HML_t) + e$. Where (L)/(H) refer to the lowest and highest abnormal accruals deciles, respectively. Standard deviation σ_p for different deciles are also calculated.

The FF is applied to all samples (A, B, C, and D) and to their combinations samples (A+B), and (C+D)[7].

Estimated abnormal returns are based on all monthly return observations at the one decile level over the 23 portfolio formations. Averages of monthly estimated abnormal returns are presented for the three periods (i.e., the first, second and third 12 months) as from formations. Finally, sample deciles' adjusted returns are estimated using the value-weighted basis

Tables 7.4.1, 7.4.2, 7.4.3, 7.4.4, 7.4.5, and 7.4.6 show results of the FF test for the samples (A, B, C, and D), (A+B), and (C+D), respectively.

Results in tables 7.4.5 and 7.4.6 for samples A+B and C+D reveals that the FF three factor model explains a large proportion of the time-series variation of the portfolios returns for all ten abnormal accruals deciles, with relatively reasonable explanatory power R^2 ranged from 49.9% to 74.0% and from 54.9% to 74.1% for the samples, respectively, with no evident pattern moving through different decile levels.

However, compared with all the results mentioned before, the FF three factor model produces stronger evidence that the extreme portfolios, specifically, deciles 1, 9, and 10, earn statistically significant negative abnormal returns. Deciles 1, 2, 9, and 10 in all six samples earn significant negative abnormal returns (in red) on 23 occasions out of a total of 25, as

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[7] When the FF is estimated for the sample A+B the first 9 return observations regarding R_{pt}, R_{mt}, SMB_t, HML_t come from sample A alone as this sample starts 9 months before sample B, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in a test period. When the FF is estimated for the sample C+D the first 6 return observations regarding R_{pt}, and R_{mt}, SMB_t, HML_t come from sample C alone as this sample starts 6 months before sample D, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in a test period.

TABLE 7.4

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Each year starting from 1979 to 2001 LSE shares with available accounting data for 12 years or more are sorted based on the quarter of the year they publish their accounting data. Accordingly, four main samples are obtained (A, B, C and D). These samples include all shares that publish their accounting data during the *first quarter/the fourth quarter/the first half* / and the *second half of the year, respectively*. Then, the share's abnormal accruals are estimated for each of the four samples for 23 test periods. A share's abnormal accruals are estimated according to the following MJM equation: $U_{it} = TA_{it}/A_{it-1} - (a_i\,[1/A_{it-1}] + b_{1i}\,[(\Delta REV_{it} - \Delta REC_{it})/A_{it-1}] + b_{2i}\,[PPE_{it}/A_{it-1}])$. Where: ($U_{it}$) is the estimated abnormal accruals for firm *i* as in year *t*. (TA_{it}) is total accruals for firm *i* as in year *t*. (A_{it-1}) is total assets for firm *i* as in year *t-1*. (ΔREV_{it}) is revenues in year *t* less revenues in year t_{-1} for firm *i*. (ΔREC_{it}) is net receivables in year *t* less net receivables in year t_{-1} for firm *i*. Finally, (PPE_{it}) is gross property, plant, and equipment in year *t* for firm *i*. Each year, a sample's shares are sorted on the basis of their abnormal accruals and assigned to 10 abnormal accruals portfolios. Abnormal accruals decile number one in a specific year includes the lowest 10% of abnormal accruals shares, and so on, till abnormal accruals decile number ten that contains the highest 10% of abnormal accruals shares. Returns of the abnormal accruals deciles are estimated for 36 months starting 6 months after their financial quarter to ensure that the accounting data is already public. That is; the first test period is (Oct. 1979- Sep. 1982), (Jul. 1980- Jun. 1983), (Jan. 1980- Dec. 1982), and (Jul. 1980- Jun. 1983) and the last test period is (Oct. 2001- Sep. 2004), (Jul. 2002- Jun. 2005), (Jan. 2002- Dec. 2004), and (Jul. 2002- Jun. 2005) for the samples, respectively.

The estimated **FF** model is as follows: $\mathbf{R_{pt} - R_{ft} = \alpha_p + b_p\,(R_{mt} - R_{ft}) + s_p(SMB_t) + h_p(HML_t) + e_p}$.

Where: R_{pt} is the return on the decile portfolio in month t. R_{ft} is the 30-day risk-free rate of return in month t. α_p is the estimated abnormal performance for portfolio p. b_p is the systematic measure of risk. ($R_{mt} - R_{ft}$) is the month t return premium on the market portfolio m. s_p is the slope or factor sensitivity in (SMB_t). SMB_t is the month t difference between the return on a portfolio of small shares (the smallest 50% of shares in a market portfolio) and the return on a portfolio of big shares (the biggest 50% of shares in the market portfolio). h_p is the slope or factor sensitivity in (HML_t). HML_t is the month t difference between the return on a portfolio of high B/M shares (the highest 32% of B/M shares) and the return on a portfolio of low B/M shares (the lowest 32% of B/M shares). And finally (e_p) is the 'stochastic' or 'random error'. The following FF arbitrage portfolio (i.e., deciles (1-10)) is also estimated for sample deciles: $\mathbf{R_{Lt} - R_{Ht} = \alpha_{L-H} + b_{L-H}\,(R_{mt} - R_{ft}) + s_{L-H}(SMB_t) + h_{L-H}(HML_t) + e}$. Where ($_L$) and ($_H$) refer to the lowest and highest abnormal accruals deciles, respectively. Regressions' standard deviation σ_{pt} and R^2 for different deciles are calculated. The FF is also applied to the samples A+B, and C+D. When the FF is estimated for sample A+B the first 9 return observations regarding R_{pt}, R_{mt}, SMB_t, and HML_t come from sample A alone as this sample starts 9 months before sample B, then the following 267 return observations are averaged for both samples. The last 9 observations come from sample B alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. When the FF is estimated for sample C+D the first 6 return observations regarding R_{pt}, R_{mt}, SMB_t, and HML_t come from sample C alone as this sample starts 6 months before sample D, then the following 270 return observations are averaged for both samples. The last 6 observations come from sample D alone. This procedure is applied to each of the three distinct 12-month sub-periods included in test periods. Estimated abnormal returns are drawn on all 23 portfolio formations, and presented per month for three distinct periods; first, second, and third 12 months as from portfolio formations. The following six tables 7.4.1, 7.4.2, 7.4.3, 7.4.4, 7.4.5, and 7.4.6 include the FF test results for the samples (A, B, C, and D) and A+B and C+D, respectively.

Estimated abnormal returns -(the first column)- of each of the three distinct periods are presented accompanied with t-statistic (t-), where:

- *Shows significant negative-abnormal returns at the 5% two-tailed (critical t- is -2.00). When a cell is framed with red shows significant negative-abnormal returns at 1% two-tailed (critical t- is -2.8).*
- *Shows significant positive-abnormal returns at the 5% two-tailed (critical t- is 2.00). When a cell is framed with blue shows significant positive-abnormal returns at 1% two-tailed (critical t- is 2.8).*

SAMPLE (A):

TABLE 7.4.1

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Panel (A): Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

FIRST 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00381	-1.02	0.99	0.19	0.23	0.365	0.062
DEC. 2	-0.00779	-1.96	1.13	0.14	0.08	0.396	0.065
DEC. 3	-0.00092	-0.34	1.08	0.02	-0.03	0.578	0.044
DEC. 4	0.00102	0.33	1.14	0.37	0.11	0.509	0.051
DEC. 5	0.00358	1.03	1.02	0.05	-0.27	0.429	0.057
DEC. 6	-0.00102	-0.37	0.98	-0.02	-0.10	0.527	0.045
DEC. 7	-0.00520	-1.79	1.02	0.11	-0.26	0.508	0.048
DEC. 8	-0.00419	-1.46	1.04	-0.08	0.04	0.539	0.047
DEC. 9	-0.00151	-0.39	1.16	0.04	0.19	0.437	0.063
DEC. 10	-0.00381	-1.17	1.09	0.38	0.02	0.459	0.054
DEC(1-10)	-0.00001	0.00	-0.10	-0.19	0.20	0.011	0.085

SECOND 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00725	-2.00	1.06	0.27	0.30	0.426	0.059
DEC. 2	-0.00548	-1.44	1.11	0.25	0.25	0.416	0.062
DEC. 3	0.00531	1.71	1.00	0.33	0.01	0.449	0.050
DEC. 4	-0.00737	-2.07	1.14	0.15	0.02	0.450	0.058
DEC. 5	0.00320	1.01	0.99	0.07	-0.11	0.439	0.052
DEC. 6	0.00266	0.83	1.12	0.11	0.02	0.496	0.052
DEC. 7	-0.00054	-0.19	0.86	0.05	-0.12	0.442	0.045
DEC. 8	0.00108	0.37	0.88	-0.06	0.07	0.447	0.048
DEC. 9	-0.00460	-1.25	1.02	0.18	-0.12	0.376	0.060
DEC. 10	-0.00799	-2.37	1.07	0.16	-0.01	0.443	0.055
DEC(1-10)	0.00074	0.17	0.00	0.11	0.31	0.035	0.072

THIRD 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00033	-0.09	1.17	0.29	0.20	0.413	0.063
DEC. 2	-0.00256	-0.62	1.05	0.10	0.04	0.337	0.067
DEC. 3	-0.00177	-0.61	1.01	0.19	-0.19	0.469	0.048
DEC. 4	0.00313	0.81	1.09	0.09	0.07	0.385	0.063
DEC. 5	-0.00482	-1.60	1.00	0.15	-0.04	0.451	0.049
DEC. 6	-0.00291	-1.01	0.90	0.14	-0.01	0.423	0.047
DEC. 7	0.00017	0.06	0.93	-0.16	0.09	0.448	0.050
DEC. 8	0.00305	0.97	1.04	0.46	0.06	0.455	0.051
DEC. 9	-0.00399	-1.19	1.02	0.40	-0.12	0.403	0.055
DEC. 10	-0.00462	-1.32	0.96	0.40	0.16	0.366	0.057
DEC(1-10)	0.00429	0.85	0.21	-0.10	0.04	0.019	0.083

Note that a figure of, say, α_p= -0.00381 should be interpreted as abnormal return of -0.381% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Estimated monthly premiums on (i) size (SMB) and (ii) B/M equity (HML).

DESCRIPTION	*FACTOR PREMIUMS* SMB	HML
Arithmetic Mean Monthly Returns (%)	0.175	0.491
Standard Deviation (%)	3.995	3.746

SAMPLE (B):

TABLE 7.4.2

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Panel (A): Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

FIRST 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00116	-0.30	1.12	0.13	-0.03	0.398	0.064
DEC. 2	-0.00034	-0.14	1.02	0.25	-0.07	0.571	0.040
DEC. 3	-0.00252	-1.01	1.10	0.11	0.04	0.607	0.041
DEC. 4	0.00105	0.31	1.07	0.11	-0.15	0.444	0.056
DEC. 5	-0.00155	-0.62	1.04	0.09	-0.04	0.587	0.041
DEC. 6	0.00205	0.71	1.01	0.21	0.09	0.485	0.048
DEC. 7	0.00187	0.74	1.12	0.06	-0.03	0.616	0.042
DEC. 8	0.00059	0.25	1.03	0.01	-0.05	0.618	0.039
DEC. 9	-0.00507	-1.91	1.23	0.15	-0.11	0.629	0.044
DEC. 10	0.00069	0.23	1.09	0.28	-0.04	0.505	0.049
DEC(1-10)	-0.00185	-0.40	0.03	-0.15	0.01	0.008	0.076

SECOND 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00853	-2.82	1.04	-0.04	0.05	0.500	0.049
DEC. 2	0.00145	0.46	1.09	0.15	-0.12	0.477	0.052
DEC. 3	0.00082	0.36	1.20	0.26	-0.08	0.677	0.037
DEC. 4	0.00006	0.02	1.04	0.10	-0.21	0.516	0.047
DEC. 5	0.00222	0.78	1.01	0.12	-0.13	0.497	0.046
DEC. 6	0.00494	1.22	1.10	0.16	0.04	0.366	0.066
DEC. 7	0.00222	0.83	0.99	-0.11	-0.09	0.549	0.044
DEC. 8	-0.00060	-0.22	1.11	0.23	-0.03	0.550	0.045
DEC. 9	-0.00542	-2.05	1.15	0.23	-0.12	0.590	0.043
DEC. 10	-0.00626	-2.19	1.16	0.24	-0.07	0.557	0.047
DEC(1-10)	-0.00227	-0.59	-0.13	-0.28	0.12	0.031	0.063

THIRD 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00188	-0.56	1.08	0.31	0.06	0.421	0.055
DEC. 2	-0.00116	-0.42	1.06	0.41	-0.13	0.510	0.045
DEC. 3	-0.00344	-1.36	1.16	0.09	0.18	0.618	0.041
DEC. 4	0.00271	0.78	0.88	0.16	0.01	0.314	0.057
DEC. 5	0.00285	1.07	1.09	-0.03	-0.07	0.564	0.043
DEC. 6	-0.00452	-1.59	1.07	0.02	0.00	0.517	0.047
DEC. 7	0.00479	1.68	0.98	0.06	0.00	0.471	0.046
DEC. 8	-0.00109	-0.47	1.12	0.07	-0.11	0.638	0.038
DEC. 9	-0.00215	-0.70	1.26	0.41	0.08	0.545	0.050
DEC. 10	-0.00820	-2.62	1.17	0.40	-0.06	0.497	0.051
DEC(1-10)	0.00632	1.45	-0.10	-0.09	0.12	0.007	0.071

Note that a figure of, say, α_p= -0.00116 should be interpreted as abnormal return of -0.116% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Estimated monthly premiums on (i) size (SMB) and (ii) B/M equity (HML).

DESCRIPTION	*FACTOR PREMIUMS* SMB	HML
Arithmetic Mean Monthly Returns (%)	0.17	0.467
Standard Deviation (%)	4.08	3.959

SAMPLE (C):

TABLE 7.4.3

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Panel (A): Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

	FIRST 12 MONTHS						
DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00637	-1.65	1.13	0.25	0.21	0.411	0.064
DEC. 2	-0.00919	-2.94	1.18	0.13	0.14	0.539	0.051
DEC. 3	0.00138	0.49	1.08	0.28	-0.04	0.527	0.046
DEC. 4	0.00025	0.09	1.04	0.20	-0.02	0.529	0.045
DEC. 5	0.00334	1.15	1.02	0.03	-0.21	0.510	0.048
DEC. 6	0.00098	0.36	1.03	0.10	-0.03	0.532	0.045
DEC. 7	-0.00352	-1.36	0.98	0.04	-0.24	0.548	0.043
DEC. 8	-0.00038	-0.14	1.01	0.03	0.01	0.544	0.044
DEC. 9	-0.00048	-0.16	1.13	0.25	-0.05	0.526	0.049
DEC. 10	-0.00664	-2.18	1.18	0.42	-0.08	0.526	0.050
DEC(1-10)	0.00027	0.06	-0.06	-0.17	0.29	0.022	0.079

	SECOND 12 MONTHS						
DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00910	-2.36	1.28	0.58	0.19	0.476	0.063
DEC. 2	-0.00045	-0.13	1.24	0.28	0.09	0.510	0.055
DEC. 3	0.00292	0.99	0.96	0.20	0.12	0.459	0.048
DEC. 4	-0.00653	-1.81	1.18	0.17	0.02	0.461	0.059
DEC. 5	0.00331	1.03	1.07	0.28	-0.23	0.459	0.052
DEC. 6	-0.00273	-1.06	0.86	0.02	-0.04	0.482	0.042
DEC. 7	-0.00011	-0.04	0.83	-0.07	-0.03	0.472	0.043
DEC. 8	-0.00010	-0.03	0.97	0.01	0.13	0.469	0.049
DEC. 9	-0.00803	-2.53	1.01	0.19	0.00	0.444	0.052
DEC. 10	-0.00679	-2.05	1.09	0.14	-0.06	0.460	0.054
DEC(1-10)	-0.00231	-0.48	0.19	0.44	0.25	0.081	0.078

	THIRD 12 MONTHS						
DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00317	-0.80	1.20	0.25	-0.04	0.397	0.065
DEC. 2	-0.00208	-0.66	1.04	0.22	0.03	0.443	0.051
DEC. 3	-0.00516	-1.64	1.12	0.17	-0.04	0.482	0.051
DEC. 4	-0.00019	-0.07	0.88	0.03	0.08	0.419	0.047
DEC. 5	-0.00238	-0.72	1.18	0.29	-0.21	0.481	0.054
DEC. 6	0.00020	0.08	0.91	0.09	0.06	0.480	0.042
DEC. 7	-0.00117	-0.40	0.89	-0.03	0.23	0.436	0.047
DEC. 8	0.00092	0.30	1.09	0.29	0.04	0.479	0.050
DEC. 9	-0.00057	-0.20	0.93	0.29	0.04	0.444	0.046
DEC. 10	-0.00509	-1.60	1.03	0.35	0.01	0.435	0.052
DEC(1-10)	0.00192	0.39	0.16	-0.11	-0.05	0.015	0.081

Note that a figure of, say, α_p= -0.00637 should be interpreted as abnormal return of -0.637% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Estimated monthly premiums on (i) size (SMB) and (ii) B/M equity (HML).

DESCRIPTION	*FACTOR PREMIUMS*	
	SMB	HML
Arithmetic Mean Monthly Returns (%)	0.202	0.511
Standard Deviation (%)	4.085	3.805

SAMPLE (D):

TABLE 7.4.4

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Panel (A): Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

FIRST 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00354	-1.09	1.10	0.17	0.01	0.473	0.053
DEC. 2	0.00145	0.60	1.03	0.15	-0.12	0.591	0.039
DEC. 3	-0.00311	-1.38	1.03	0.10	0.00	0.623	0.037
DEC. 4	0.00202	0.75	1.03	0.04	-0.11	0.545	0.044
DEC. 5	-0.00129	-0.54	0.97	0.04	-0.04	0.572	0.039
DEC. 6	0.00083	0.37	1.08	0.13	-0.03	0.643	0.037
DEC. 7	0.00041	0.18	1.13	-0.05	0.00	0.676	0.038
DEC. 8	-0.00094	-0.37	1.15	0.33	-0.03	0.600	0.042
DEC. 9	-0.00519	-2.11	1.19	0.11	-0.02	0.653	0.040
DEC. 10	0.00154	0.56	1.09	0.23	-0.04	0.548	0.045
DEC(1-10)	-0.00508	-1.29	0.01	-0.06	0.04	0.002	0.065

SECOND 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00455	-1.61	1.02	0.00	0.07	0.524	0.046
DEC. 2	0.00155	0.57	1.16	0.17	-0.17	0.592	0.044
DEC. 3	-0.00234	-1.10	1.11	0.13	-0.06	0.682	0.035
DEC. 4	-0.00164	-0.64	1.09	0.16	-0.20	0.586	0.042
DEC. 5	0.00282	1.13	1.03	0.09	-0.05	0.573	0.041
DEC. 6	0.00218	0.91	1.01	-0.04	-0.07	0.603	0.039
DEC. 7	0.00326	1.25	0.99	-0.05	-0.01	0.550	0.043
DEC. 8	-0.00080	-0.33	1.12	0.30	-0.06	0.612	0.040
DEC. 9	-0.00747	-2.90	1.23	0.14	-0.07	0.642	0.042
DEC. 10	-0.00335	-1.40	1.11	0.15	-0.03	0.629	0.039
DEC(1-10)	-0.00121	-0.36	-0.09	-0.15	0.10	0.014	0.055

THIRD 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	0.00150	0.51	1.00	0.23	0.08	0.457	0.048
DEC. 2	-0.00253	-1.10	1.08	0.23	-0.10	0.607	0.038
DEC. 3	-0.00300	-1.33	1.12	0.12	0.07	0.648	0.037
DEC. 4	0.00099	0.31	0.88	-0.01	0.05	0.376	0.051
DEC. 5	0.00239	1.11	1.05	0.11	-0.11	0.632	0.035
DEC. 6	0.00020	0.09	1.06	-0.01	0.00	0.637	0.036
DEC. 7	0.00331	1.32	0.94	-0.02	0.00	0.521	0.041
DEC. 8	-0.00567	-2.49	1.19	0.11	0.07	0.669	0.037
DEC. 9	-0.00326	-1.15	1.25	0.37	0.02	0.578	0.046
DEC. 10	-0.00769	-2.66	1.13	0.26	-0.08	0.519	0.047
DEC(1-10)	0.00919	2.29	-0.13	-0.03	0.16	0.013	0.066

Note that a figure of, say, α_p= -0.00354 should be interpreted as abnormal return of -0.354% per month calculated over the first 12 months as from portfolio formation.

Panel (B): Estimated monthly premiums on (i) size (SMB) and (ii) B/M equity (HML).

DESCRIPTION	*FACTOR PREMIUMS*	
	SMB	HML
Arithmetic Mean Monthly Returns (%)	0.173	0.476
Standard Deviation (%)	4.103	3.995

SAMPLE (A+B):

TABLE 7.4.5

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

FIRST 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00322	-1.21	1.04	0.09	0.06	0.547	0.044
DEC. 2	-0.00364	-1.62	1.07	0.11	-0.02	0.633	0.038
DEC. 3	-0.00201	-1.09	1.09	0.04	-0.02	0.740	0.031
DEC. 4	0.00103	0.45	1.10	0.14	-0.04	0.637	0.038
DEC. 5	0.00092	0.42	1.03	0.04	-0.08	0.639	0.037
DEC. 6	0.00049	0.24	1.00	0.05	0.00	0.658	0.034
DEC. 7	-0.00163	-0.80	1.07	0.04	-0.06	0.691	0.034
DEC. 8	-0.00197	-1.03	1.03	-0.01	-0.02	0.713	0.032
DEC. 9	-0.00353	-1.51	1.19	0.04	0.03	0.679	0.039
DEC. 10	-0.00172	-0.73	1.08	0.18	-0.02	0.611	0.039
DEC(1-10)	-0.00150	-0.44	-0.04	-0.09	0.08	0.017	0.057

SECOND 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00803	-3.55	1.04	0.05	0.12	0.635	0.037
DEC. 2	-0.00179	-0.73	1.10	0.11	0.01	0.603	0.040
DEC. 3	0.00330	1.63	1.11	0.15	-0.02	0.684	0.034
DEC. 4	-0.00277	-1.20	1.08	0.06	-0.04	0.624	0.038
DEC. 5	0.00332	1.54	1.00	0.05	-0.08	0.623	0.036
DEC. 6	0.00370	1.48	1.11	0.07	0.02	0.601	0.041
DEC. 7	0.00089	0.47	0.93	-0.01	-0.06	0.660	0.032
DEC. 8	0.00085	0.43	0.99	0.04	0.00	0.664	0.033
DEC. 9	**-0.00483**	-2.21	1.09	0.11	-0.07	0.647	0.036
DEC. 10	-0.00689	-3.13	1.11	0.11	-0.02	0.653	0.036
DEC(1-10)	-0.00114	-0.40	-0.07	-0.06	0.14	0.046	0.047

THIRD 12 MONTHS

DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00069	-0.26	1.12	0.15	0.07	0.562	0.044
DEC. 2	-0.00124	-0.49	1.07	0.13	-0.03	0.556	0.042
DEC. 3	-0.00211	-1.05	1.09	0.08	-0.01	0.675	0.033
DEC. 4	0.00319	1.20	0.99	0.07	0.02	0.499	0.044
DEC. 5	-0.00065	-0.32	1.04	0.03	-0.02	0.650	0.034
DEC. 6	-0.00385	-1.79	0.99	0.04	0.00	0.604	0.035
DEC. 7	0.00246	1.14	0.96	-0.03	0.03	0.607	0.036
DEC. 8	0.00110	0.59	1.08	0.14	-0.02	0.697	0.031
DEC. 9	-0.00321	-1.35	1.13	0.20	-0.03	0.608	0.039
DEC. 10	**-0.00601**	-2.56	1.07	0.20	0.02	0.593	0.039
DEC(1-10)	0.00532	1.56	0.04	-0.05	0.05	0.011	0.056

Note that a figure of, say, α_p= -0.00322 should be interpreted as abnormal return of -0.322% per month calculated over the first 12 months as from portfolio formation.

SAMPLE (C+D):

TABLE 7.4.6

THE FAMA AND FRENCH'S (FF) THREE FACTOR MODEL (1993). ALPHAS, BETAS, STANDARD DEVIATIONS, AND SLOPES ON SIZE, AND BOOK-TO-MARKET RATIO FACTORS FOR PORTFOLIOS FORMED ON THE BASIS OF ABNORMAL ACCRUALS. *(FF REGRESSIONS ARE BASED ON ALL THE MONTHLY VALUE-WEIGHTED OBSERVATIONS FOR A PORTFOLIO, USING ALL 23 TEST PERIODS).*

Deciles' estimated Alphas, size and B/M ratio slopes using the FF Three Factor Model regressions.

	FIRST 12 MONTHS							SECOND 12 MONTHS							THIRD 12 MONTHS						
DECILE	α_p	t-	b_p	s_p	h_p	R^2	Sigma	α_p	t-	b_p	s_p	h_p	R^2	Sigma	α_p	t-	b_p	s_p	h_p	R^2	Sigma
DEC. 1	-0.00561	-2.43	1.10	0.10	0.08	0.644	0.038	-0.00694	-3.08	1.14	0.13	0.12	0.671	0.037	-0.00102	-0.42	1.09	0.11	0.05	0.590	0.040
DEC. 2	-0.00378	-1.99	1.10	0.08	-0.01	0.725	0.031	0.00091	0.43	1.21	0.12	-0.04	0.711	0.035	-0.00194	-0.97	1.06	0.12	-0.03	0.664	0.033
DEC. 3	-0.00046	-0.26	1.06	0.10	-0.03	0.736	0.029	0.00053	0.30	1.03	0.08	0.03	0.717	0.030	-0.00377	-1.91	1.12	0.08	0.01	0.696	0.032
DEC. 4	0.00115	0.57	1.04	0.06	-0.04	0.678	0.033	-0.00363	-1.66	1.14	0.10	-0.06	0.672	0.036	0.00072	0.33	0.88	0.00	0.05	0.549	0.036
DEC. 5	0.00120	0.61	1.00	0.02	-0.08	0.681	0.033	0.00333	1.59	1.05	0.10	-0.07	0.654	0.034	0.00017	0.08	1.12	0.10	-0.07	0.679	0.033
DEC. 6	0.00074	0.40	1.06	0.06	-0.01	0.719	0.031	0.00008	0.05	0.94	0.00	-0.03	0.680	0.030	0.00016	0.09	0.99	0.02	0.02	0.721	0.027
DEC. 7	-0.00153	-0.81	1.04	-0.01	-0.05	0.722	0.031	0.00157	0.86	0.91	-0.03	-0.02	0.678	0.030	0.00126	0.64	0.92	-0.01	0.06	0.626	0.032
DEC. 8	-0.00091	-0.49	1.06	0.07	-0.01	0.721	0.031	0.00000	0.00	1.05	0.08	0.00	0.700	0.031	-0.00216	-1.12	1.14	0.10	0.01	0.709	0.032
DEC. 9	-0.00277	-1.45	1.16	0.08	-0.01	0.741	0.032	-0.00721	-3.49	1.13	0.09	-0.04	0.692	0.034	-0.00151	-0.72	1.09	0.17	-0.02	0.653	0.034
DEC. 10	-0.00271	-1.27	1.13	0.17	-0.02	0.674	0.035	-0.00471	-2.32	1.09	0.07	-0.03	0.689	0.033	-0.00601	-2.89	1.08	0.15	-0.02	0.652	0.034
DEC(1-10)	-0.00290	-0.92	-0.03	-0.07	0.10	0.024	0.052	-0.00223	-0.77	0.05	0.05	0.15	0.068	0.047	0.00499	1.62	0.01	-0.05	0.07	0.012	0.051

Note that a figure of, say, α_p= -0.00561 should be interpreted as abnormal return of -0.561% per month calculated over the first 12 months as from portfolio formation.

follows: six relate to decile 1, one relates to decile 2, six relate to decile 9, and ten relate to decile 10.

All returns per month, deciles number 9 in samples (A+B) and (C+D) produce significant negative abnormal returns over the second year as from portfolio formations of -0.483% (t-stat. -2.21) and -0.721% (t-stat. -3.49), respectively.

Decile number 10 in both samples A+B and C+D produce negative abnormal returns over the second and third years of [-0.689% per month (t-stat. -3.13) and -0.601% per month (t-stat. -2.56)], and of [-0.471% per month (t-stat. -2.32) and -0.601% per month (t-stat. -2.89)], respectively.

On the other hand, decile 1 in sample A+B produces significant negative abnormal returns of -0.803% per month (t-stat. -3.55) over the second 12 months. The same decile in sample (C+D) also produces significant negative abnormal returns of -0.561% per month (t-stat. -2.43) and -0.694% per month (t-stat. -3.08) over the first and second years, respectively.

The arbitrage portfolio earns low insignificant negative abnormal returns over the first two years for both samples A+B and C+D.

And so, results of estimated abnormal returns using the FF three factor model share with the CAPM and the rest of tests the same findings regarding the hypotheses of this study, more specifically, the *alternative* hypothesis that the highest abnormal accruals deciles produces negative adjusted returns is accepted. The *hypothesis* that the lowest abnormal accruals deciles produce adjusted returns undifferentiated from zero is accepted. And finally, the third *hypothesis* that the arbitrage portfolio produces abnormal returns indistinguishable from zero is also accepted.

In general, the estimated loadings on the market factor are close to unity for all ten deciles, with values slightly higher for the extreme abnormal accruals deciles. Regarding sample A+B, over the first, second, and third year as from portfolio formations, decile 1 has loadings on the market factor of (1.04, 1.04, and 1.12), decile 2 (1.07, 1.10, and 1.07), decile 9 (1.19, 1.09, and 1.13), and decile 10 (1.08, 1.11, and 1,07), respectively. The same deciles have corresponding comparable loading in sample C+D as follows: decile 1 (1.10, 1.14, and 1.09), decile 2 (1.10, 1.21, and 1.06), decile 9 (1.16, 1.13, and 1.09), and decile 10 (1.13, 1.09, and 1.08), respectively.

Therefore, risk factors summarised in loadings on the market factor using the FF three factor model can not help explain why the extreme portfolios, mainly deciles 1, 9, and 10 underperform the rest of deciles.

Deciles' estimated standard deviations range from 3.1% to 4.4% for sample A+B and from 2.7% to 4.0% for sample C+D, that is; the abnormal accruals deciles do not vary significantly in the dispersion (a measure of risk) of estimated returns, and so, no answer to why deciles 1, 9, and 10 underperform the rest of deciles is obtained yet.

Applying the FF three factor model to US data, Houge and Loughran (2000) report that most of the total accruals anomaly documented by Sloan (1996) is caused by the highest total accruals deciles. Using monthly returns and the equally-weighted method over the period 1963-1994, they report estimated monthly abnormal returns accompanied with t-statistics of 0.15% (t=1.33), 0.06% (0.77), -0.02% (-0.34), and -0.53% (-5.67), and 0.68 (5.78) for deciles 1, 2, 9, 10, and the hedge portfolio (deciles 1-10), respectively. All returns calculated over the first year as from portfolio formations.

7.3 Percentages of Shares' Deletions

Total numbers and total values of deleted shares within sample deciles are presented in tables 7.5.1, 7.5.2, 7.5.3, 7.5.4, 7.5.5, and 7.5.6 for the samples (A, B, C, and D), (A+B) and (C+D), respectively. Share values are presented in £1000 using the equally-weighted basis. Deletions are distinguished on the basis of whether they are with value (e.g., mergers) or valueless (e.g., liquidations). A summary for the entire sample is also reported. Results are drawn on all 23 test periods.

Both samples (A+B) and (C+D) show evidence of higher numbers of deletions without value (e.g., liquidations) for the extreme portfolios compared with the rest of portfolios as appears in tables 7.5.5 and 7.5.6, respectively.

Regarding sample (A+B), deciles 1, 2, 9, and 10 experience numbers of deletions of 46, 33, 29, and 31 out of a total of 243 firms deleted without value accumulated over the 36 month-test periods, respectively. Percentages of share deletions without value moving from the lowest to the highest abnormal accrual deciles are as follows: [18.9%, 13.6%, 7.4%, 10.7%, 7.8%, 3.3%, 6.6%, 7.0%, 11.9%, and 12.8%, respectively].

On the other hand, deletions with value (e.g., mergers and acquisitions) are close to 10% for all deciles. In percentages, [10.6%, 10.3%, 9.4%, 9.9%, 9.4%, 9.7%, 9.4%, 9.5%, 11.6%, and 10.2%] all of 1464 firms were deleted with value, relate to the abnormal accruals deciles moving from the lowest to the highest, respectively.

Similar finding occurs for sample (C+D), where [19.0%, 14.8%, 7.1%, 9.0%, 6.8%, 5.1%, 7.7%, 6.8%, 10.0%, and 13.8%] all of 311 firms were deleted without value, relate to the abnormal accruals deciles moving from the lowest to the highest, respectively. And [10.4%, 10.5%, 10.1%, 9.6%, 9.5%, 9.1%, 9.7%, 9.7%, 10.8%, and 10.5%] of 1953 firms were deleted with value, relate to the abnormal accruals deciles moving from the lowest to the highest, respectively.

SAMPLE (A): **FIGURE 7.5.1**

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE A DECILES. *(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).*

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	369139172	340	275003808	310	256109506	279	
	Deleted with Value	3972296	22	2313497	25	5264960	24	71
	Deleted valueless	31000	8	81181	6	101437	4	18
2	*Market Value*	117974468	337	93334632	305	91577464	282	
	Deleted with Value	4568356	27	7239622	18	2641911	18	63
	Deleted valueless	37041	5	72384	5	106286	4	14
3	*Market Value*	222261858	333	199971056	312	230863712	293	
	Deleted with Value	2253547	18	2177804	15	9983957	20	53
	Deleted valueless	188493	3	70995	4	215126	2	9
4	*Market Value*	194561432	332	203041561	315	164044288	284	
	Deleted with Value	892300	14	3831104	30	4872859	20	64
	Deleted valueless	7518	3	19222	1	74152	5	9
5	*Market Value*	272843428	328	247649081	304	237853043	279	
	Deleted with Value	3189128	22	5302152	20	4594364	15	57
	Deleted valueless	194000	2	125612	5	27455	2	9
6	*Market Value*	199219751	330	199963791	306	235682979	283	
	Deleted with Value	3401722	23	6919603	22	3703351	19	64
	Deleted valueless	1000	1	37301	1	193000	1	3
7	*Market Value*	192429880	327	202244745	306	219417468	278	
	Deleted with Value	2088516	19	4578831	27	14471160	25	71
	Deleted valueless	50520	2	1000	1	142783	2	5
8	*Market Value*	187493905	333	179427641	309	187556787	285	
	Deleted with Value	7400523	23	4433402	19	6019790	17	59
	Deleted valueless	23000	1	119292	5	62472	4	10
9	*Market Value*	87946774	333	94114226	309	97137290	279	
	Deleted with Value	4331113	22	6174882	24	4601691	25	71
	Deleted valueless	26629	2	435495	6	326602	3	11
10	*Market Value*	106021302	337	115410529	317	102624141	295	
	Deleted with Value	1177728	16	2311529	22	1963173	26	64
	Deleted valueless	13000	4	0	0	55980	6	10

Note that, as an example; 340 firms are all the firms tested in the lowest abnormal accruals decile in sample (A). 22 and 8 firms out of the 340 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

ALL SAMPLE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
	Market Value	2.E+09	3330	2.E+09	3093	2.E+09	2837	
	Deleted with Value	33275230	206	45282425	222	58117216	209	637
	Deleted valueless	572202	31	962484	34	1305293	33	98
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	1.7%	6.2%	2.5%	7.2%	3.2%	7.4%	
	Deleted valueless	0.0%	0.9%	0.1%	1.1%	0.1%	1.2%	

Note that percentages of, say, 1.7% and 6.2% should be interpreted as deletions with value of 1.7% and 6.2% of recorded share values and numbers, respectively.

SAMPLE (B): **FIGURE 7.5.2**

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE B DECILES. *(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).*

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	181759845	464	180475194	429	174056221	397	
	Deleted with Value	5764094	27	2999205	23	5853100	34	84
	Deleted valueless	1396164	8	138513	9	312391	11	28
2	*Market Value*	148228226	461	159081908	430	173586388	393	
	Deleted with Value	3360344	26	6720499	31	5757124	31	88
	Deleted valueless	142712	5	262407	6	151846	8	19
3	*Market Value*	219953950	459	220097327	424	227142214	391	
	Deleted with Value	9287151	31	6344681	30	3035115	24	85
	Deleted valueless	51095	4	54710	3	55646	2	9
4	*Market Value*	375943730	456	418040069	420	442330855	386	
	Deleted with Value	10707291	28	2454516	27	7692847	26	81
	Deleted valueless	57284	8	231098	7	67270	2	17
5	*Market Value*	354372247	452	359369158	429	387989452	392	
	Deleted with Value	2520390	23	6219098	31	12655431	27	81
	Deleted valueless	0	0	162755	6	138487	4	10
6	*Market Value*	375324689	452	450113730	421	512482991	388	
	Deleted with Value	8984385	31	17903812	30	8075927	17	78
	Deleted valueless	0	0	49670	3	116702	2	5
7	*Market Value*	313170381	452	350848483	432	376417307	402	
	Deleted with Value	1791815	18	11522246	27	15663500	21	66
	Deleted valueless	16580	2	56197	3	463462	6	11
8	*Market Value*	540366881	458	543355792	434	594869794	404	
	Deleted with Value	3076604	22	12060106	27	12860364	31	80
	Deleted valueless	7000	2	28728	3	29713	2	7
9	*Market Value*	263129483	460	265336173	423	275886235	382	
	Deleted with Value	5339160	30	3292451	34	10928447	35	99
	Deleted valueless	101006	7	429219	7	824722	4	18
10	*Market Value*	126564335	464	146647625	441	149188900	402	
	Deleted with Value	3123869	16	10128465	34	9177005	35	85
	Deleted valueless	40103	7	105623	5	513813	9	21

Note that, as an example; 464 firms are all the firms tested in the lowest abnormal accruals decile in sample (B). 27 and 8 firms out of the 464 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

ALL SAMPLE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
	Market Value	3.E+09	4578	3.E+09	4283	3.E+09	3937	
	Deleted with Value	53955103	252	79645077	294	91698861	281	827
	Deleted valueless	1811944	43	1518920	52	2674051	50	145
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	1.9%	5.5%	2.6%	6.9%	2.8%	7.1%	
	Deleted valueless	0.1%	0.9%	0.0%	1.2%	0.1%	1.3%	

Note that percentages of, say, 1.9% and 5.5% should be interpreted as deletions with value of 1.9% and 5.5% of recorded share values and numbers, respectively.

SAMPLE (C):

FIGURE 7.5.3

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE C DECILES. *(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).*

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	377724820	454	353073179	411	354789562	368	
	Deleted with Value	7338376	31	6894263	36	8115709	35	102
	Deleted valueless	45156	12	45814	7	73757	4	23
2	*Market Value*	138833197	453	113984417	420	119602320	376	
	Deleted with Value	7589877	28	5694652	34	2366662	22	84
	Deleted valueless	81813	6	279089	10	349752	7	23
3	*Market Value*	270884429	447	253456583	415	270223336	386	
	Deleted with Value	3198967	29	4005212	25	9488300	34	88
	Deleted valueless	194000	3	62246	4	288437	4	11
4	*Market Value*	198880953	444	189598916	426	174962277	388	
	Deleted with Value	1449097	17	10026592	35	9148293	28	80
	Deleted valueless	1000	1	44290	3	181469	5	9
5	*Market Value*	313839588	446	291238603	424	288278380	392	
	Deleted with Value	1609584	21	5441788	27	5500170	27	75
	Deleted valueless	153152	1	25305	5	68507	4	10
6	*Market Value*	302896353	445	324951421	409	348977804	381	
	Deleted with Value	10035074	35	9234668	25	6415137	23	83
	Deleted valueless	2000	1	45195	3	242224	2	6
7	*Market Value*	216049863	450	228456786	423	241661092	389	
	Deleted with Value	2381451	24	4447780	30	25987644	35	89
	Deleted valueless	53816	3	126887	4	220025	6	13
8	*Market Value*	179018987	451	186191127	422	211919645	388	
	Deleted with Value	8592144	28	9587256	28	7108755	25	81
	Deleted valueless	23000	1	121723	6	66475	3	10
9	*Market Value*	113642651	448	122624777	428	126167811	387	
	Deleted with Value	4508006	18	9902256	35	3253701	24	77
	Deleted valueless	15299	2	451164	6	457193	5	13
10	*Market Value*	137942158	453	170445307	421	114750998	391	
	Deleted with Value	3327274	25	3091734	28	3313530	34	87
	Deleted valueless	66632	7	3651	2	96526	7	16

Note that, as an example; 454 firms are all the firms tested in the lowest abnormal accruals decile in sample (C). 31 and 12 firms out of the 454 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

ALL SAMPLE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
	Market Value	2.E+09	4491	2.E+09	4199	2.E+09	3846	
	Deleted with Value	50029849	256	68326201	303	80697900	287	846
	Deleted valueless	635869	37	1205364	50	2044367	47	134
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	2.2%	5.7%	3.1%	7.2%	3.6%	7.5%	
	Deleted valueless	0.0%	0.8%	0.1%	1.2%	0.1%	1.2%	

Note that percentages of, say, 2.2% and 5.7% should be interpreted as deletions with value of 2.2% and 5.7% of recorded share values and numbers, respectively.

SAMPLE (D): **FIGURE 7.5.4**

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE D DECILES. *(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).*

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	212223439	611	204492744	566	198000952	528	
	Deleted with Value	6002182	32	5338664	27	6580451	43	102
	Deleted valueless	1401647	13	103020	11	300692	12	36
2	*Market Value*	182123314	610	197001916	564	216969999	517	
	Deleted with Value	6140070	40	8315140	40	21025324	42	122
	Deleted valueless	153587	6	258762	7	246637	10	23
3	*Market Value*	272956752	611	275631603	571	280076364	523	
	Deleted with Value	8170322	37	7913894	44	3819687	29	110
	Deleted valueless	41704	3	45814	4	99687	4	11
4	*Market Value*	482500069	605	537573469	562	560437292	522	
	Deleted with Value	11880415	35	3239455	32	10676703	41	108
	Deleted valueless	38183	8	297633	8	243155	3	19
5	*Market Value*	493247317	606	563341581	578	648878508	524	
	Deleted with Value	1428643	26	18960906	47	19250558	38	111
	Deleted valueless	13000	2	192570	7	91415	2	11
6	*Market Value*	387752773	605	387897169	572	394741317	528	
	Deleted with Value	9236478	32	14186436	40	7826118	22	94
	Deleted valueless	562	1	32664	4	175460	5	10
7	*Market Value*	341514724	605	394686229	572	446694897	530	
	Deleted with Value	4633201	31	10950927	38	17242251	31	100
	Deleted valueless	31829	2	68576	4	380876	5	11
8	*Market Value*	610427347	605	622391456	569	678144302	526	
	Deleted with Value	4313620	33	16159840	38	15867592	37	108
	Deleted valueless	38000	3	168783	5	26591	3	11
9	*Market Value*	350469829	610	355321720	566	363659947	514	
	Deleted with Value	21028260	37	21909872	45	27163301	51	133
	Deleted valueless	68053	7	376695	7	791071	4	18
10	*Market Value*	154216598	611	178426382	576	189348799	524	
	Deleted with Value	5251578	28	10609609	45	12058580	46	119
	Deleted valueless	39826	7	137017	7	673869	13	27

Note that, as an example; 611 firms are all the firms tested in the lowest abnormal accruals decile in sample(D). 32 and 13 firms out of the 611 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

ALL SAMPLE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
	Market Value	3.E+09	6079	4.E+09	5696	4.E+09	5236	
	Deleted with Value	78084770	331	117584744	396	141510566	380	1107
	Deleted valueless	1826390	52	1681534	64	3029453	61	177
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	2.2%	5.4%	3.2%	7.0%	3.6%	7.3%	
	Deleted valueless	0.1%	0.9%	0.0%	1.1%	0.1%	1.2%	

Note that percentages of, say, 2.2% and 5.4% should be interpreted as deletions with value of 2.2% and 5.4% of recorded share values and numbers, respectively.

SAMPLE (A+B): **FIGURE 7.5.5**

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE A+B DECILES.
(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	550899017	804	455479001	739	430165727	676	
	Deleted with Value	9736390	49	5312701	48	11118060	58	155
	Deleted valueless	1427164	16	219694	15	413828	15	46
2	*Market Value*	266202694	798	252416540	735	265163852	675	
	Deleted with Value	7928701	53	13960120	49	8399036	49	151
	Deleted valueless	179753	10	334792	11	258131	12	33
3	*Market Value*	442215808	792	420068383	736	458005927	684	
	Deleted with Value	11540698	49	8522485	45	13019072	44	138
	Deleted valueless	239588	7	125705	7	270772	4	18
4	*Market Value*	570505162	788	621081630	735	606375143	670	
	Deleted with Value	11599591	42	6285619	57	12565706	46	145
	Deleted valueless	64802	11	250321	8	141422	7	26
5	*Market Value*	627215675	780	607018239	733	625842494	671	
	Deleted with Value	5709518	45	11521250	51	17249796	42	138
	Deleted valueless	194000	2	288367	11	165942	6	19
6	*Market Value*	574544440	782	650077521	727	748165970	671	
	Deleted with Value	12386107	54	24823415	52	11779278	36	142
	Deleted valueless	1000	1	86971	4	309702	3	8
7	*Market Value*	505600261	779	553093229	738	595834775	680	
	Deleted with Value	3880331	37	16101077	54	30134660	46	137
	Deleted valueless	67100	4	57197	4	606244	8	16
8	*Market Value*	727860786	791	722783433	743	782426581	689	
	Deleted with Value	10477127	45	16493507	46	18880154	48	139
	Deleted valueless	30000	3	148020	8	92185	6	17
9	*Market Value*	351076257	793	359450399	732	373023526	661	
	Deleted with Value	9670273	52	9467333	58	15530138	60	170
	Deleted valueless	127635	9	864714	13	1151324	7	29
10	*Market Value*	232585637	801	262058154	758	251813041	697	
	Deleted with Value	4301597	32	12439994	56	11140178	61	149
	Deleted valueless	53103	11	105623	5	569794	15	31

Note that, as an example: 804 firms are all the firms tested in the lowest abnormal accruals decile in sample (A+B). 49 and 16 firms out of the 804 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

ALL SAMPLE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
	Market Value	5.E+09	7908	5.E+09	7376	5.E+09	6774	
	Deleted with Value	87230333	458	124927502	516	149816077	490	1464
	Deleted valueless	2384145	74	2481404	86	3979344	83	243
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	1.8%	5.8%	2.5%	7.0%	2.9%	7.2%	
	Deleted valueless	0.0%	0.9%	0.1%	1.2%	0.1%	1.2%	

Note that percentages of, say, 1.8% and 5.8% should be interpreted as deletions with value of 1.8% and 5.8% of recorded share values and numbers, respectively.

SAMPLE (C+D): FIGURE 7.5.6

TOTAL NUMBERS AND TOTAL VALUES OF DELETED SHARES WITHIN SAMPLE C+D DECILES. *(SHARE VALUES ARE PRESENTED USING THE EQUALLY-WEIGHTED BASIS. DELETED COMPANIES ARE DISTINGUISHED ON THE BASIS OF WHETHER DELETIONS ARE WITH VALUE (e.g., MERGERS) OR VALUELESS (e.g., LIQUIDATIONS). A SUMMARY FOR THE ENTIRE SAMPLE IS ALSO REPORTED. RESULTS ARE DRAWN ON ALL 23 TEST PERIODS, AND PRESENTED IN £1000).*

Panel (A): Totals of numbers and values (in £1000) of share deletions within sample deciles.

NUMBER OF DECILE	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
1	*Market Value*	589948259	1065	557565922	977	552790514	896	
	Deleted with Value	13340558	63	12232927	63	14696161	78	204
	Deleted valueless	1446803	25	148833	18	374449	16	59
2	*Market Value*	320956511	1063	310986333	984	336572319	893	
	Deleted with Value	13729947	68	14009793	74	23391985	64	206
	Deleted valueless	235400	12	537851	17	596389	17	46
3	*Market Value*	543841181	1058	529088186	986	550299700	909	
	Deleted with Value	11369289	66	11919107	69	13307987	63	198
	Deleted valueless	235704	6	108060	8	388124	8	22
4	*Market Value*	681381022	1049	727172385	988	735399569	910	
	Deleted with Value	13329511	52	13266047	67	19824995	69	188
	Deleted valueless	39183	9	341924	11	424623	8	28
5	*Market Value*	807086905	1052	854580184	1002	937156889	916	
	Deleted with Value	3038227	47	24402694	74	24750728	65	186
	Deleted valueless	166152	3	217875	12	159922	6	21
6	*Market Value*	690649126	1050	712848590	981	743719121	909	
	Deleted with Value	19271552	67	23421104	65	14241255	45	177
	Deleted valueless	2562	2	77859	7	417685	7	16
7	*Market Value*	557564587	1055	623143015	995	688355990	919	
	Deleted with Value	7014652	55	15398706	68	43229895	66	189
	Deleted valueless	85645	5	195463	8	600902	11	24
8	*Market Value*	789446334	1056	808582583	991	890063947	914	
	Deleted with Value	12905764	61	25747096	66	22976347	62	189
	Deleted valueless	61000	4	290506	11	93066	6	21
9	*Market Value*	464112480	1058	477946497	994	489827759	901	
	Deleted with Value	25536267	55	31812128	80	30417002	75	210
	Deleted valueless	83352	9	827859	13	1248265	9	31
10	*Market Value*	292158756	1064	348871689	997	304099797	915	
	Deleted with Value	8578852	53	13701343	73	15372110	80	206
	Deleted valueless	106458	14	140668	9	770395	20	43

Note that, as an example; 1065 firms are all the firms tested in the lowest abnormal accruals decile in sample (C+D). 63 and 25 firms out of the 1065 were deleted with and without value, respectively, during the first 12 months as from portfolio formations. Note also that these deletions affect figures of next periods.

Panel (B): Total number and total value (in £1000) of share deletions within the sample.

	DESCRIPTION	FIRST 12 MONTHS Equally-Weighted	FIRST 12 MONTHS No. Firms	SECOND 12 MONTHS Equally-Weighted	SECOND 12 MONTHS No. Firms	THIRD 12 MONTHS Equally-Weighted	THIRD 12 MONTHS No. Firms	ALL 36 MONTHS No. of Deletions
ALL SAMPLE	*Market Value*	6.E+09	10570	6.E+09	9895	6.E+09	9082	
	Deleted with Value	128114618	587	185910944	699	222208465	667	1953
	Deleted valueless	2462260	89	2886898	114	5073820	108	311
	Market Value	100%	100%	100%	100%	100%	100%	
	Deleted with Value	2.2%	5.6%	3.1%	7.1%	3.6%	7.3%	
	Deleted valueless	0.0%	0.8%	0.0%	1.2%	0.1%	1.2%	

Note that percentages of, say, 2.2% and 5.6% should be interpreted as deletions with value of 2.2% and 5.6% of recorded share values and numbers, respectively.

The higher percentages of deletions without value being more concentrated in the extreme deciles may appear to explain the lower performance of these deciles through pushing their returns down. However, while this can be true under the equally-weighted method for calculating returns; it is not necessary to be the case under the value-weighted basis.

Under the value-weighted method, deleted firms without value negatively affect returns of their portfolios based on their relative values rather than relative to their numbers. And so, to estimate the extent of such deletions on the overall portfolio performance, we do two things. First we relate the accumulated numbers of deletions without value for the extreme portfolios 1, 2, 9, and 10 to the total number of firms in each decile as at the formation date. Second, we relate the accumulated market-value of the same deletions to the total market-value of all the shares consisting the decile as at the formation date.

Regarding sample (A+B), numbers of deletions without value represent percentages of [5.7%, 4.1%, 3.7%, and 3.9%] of their deciles' numbers of firms as at portfolio formation dates, for deciles 1, 2, 9, and 10, respectively. In terms of market-value, the same deletions for the same deciles accounts for just [0.37%, 0.29%, 0.61%, and 0.31%] of their deciles' total market-values as at portfolio formations, respectively.

Comparable percentages for sample (C+D) are [5.5%, 4.3%, 2.9%, and 4.0%] in terms of numbers, compared with just [0.33%, 0.43%, 0.47%, and 0.35%] in terms of market-value, respectively.

Consequently, the findings in terms of deletions' market values do not support the possibility that the extreme portfolios produce lower adjusted performance as a result of deletions, because deletions without value represent only very small percentages of the overall values of their portfolios measured as at dates of portfolio formations.

7.4 Percentages of Shared Shares among the Extreme Abnormal Accruals Deciles

Deciles number nine and ten (i.e., the highest abnormal accruals deciles) regularly show significant negative adjusted performance. Indeed, this apparent return pattern for these two deciles is expected by theory.

On the other hand, decile number one, and to a lesser extent decile two, tend to have negative but insignificant adjusted returns in most cases, which is opposite to what is expected by the related literature[8].

In this section, we investigate the relationship between the lowest and highest abnormal accruals deciles to see whether an explanation can be found for the observed negative adjusted performance associated with the lowest abnormal accruals deciles.

In this study, deciles' returns are calculated for 3 years as form portfolio formations. Accordingly, the same share can be tested in year t within three different abnormal accruals deciles at the same time. Consider a share (x) has been tested over three formation dates (or more) within one of the samples. Consider also, it was first tested in year t-2 of the current portfolio formation and assigned to decile number ten -(i.e., a member of the highest abnormal accruals decile hypothesised to include firms adopting income-increasing accounting choices)-, then was assigned to decile number five in year t-1, and decile number one in year t.

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[8] Despite the fact that just a little work has focused on the relation between deciles created on the basis of their shares' abnormal accruals and future returns, a study by Xie (2001) documents significant positive/negative adjusted returns associated with the lowest/highest abnormal accruals deciles, respectively. Over the first 12 months as from portfolio formations, Xie observe a significant size-adjusted returns of 4.9% and -6.1% for the lowest and highest abnormal accruals deciles, respectively. Also, in relation to the accruals anomaly, results of the size-adjusted returns for portfolios formed on the basis of total accruals by Sloan (1996) show significant excess returns of 4.9% for the lowest accruals decile over the first 12 months as from portfolio formation. On the other hand, negative adjusted returns for the highest accruals deciles extend over two years as from formation by -5.5% and -3.2%. However, Houge and Loughran (2000) conduct similar analysis to that of Sloan (1996), and confirm that the accruals anomaly derives from the poor performance of *high* accruals firms.

Such a share will be tested in year t within all three various decile levels using exactly the same returns. More specifically, share (x) in year t will be tested: (1) as for the last year (of three years) within decile number ten, as for the second year within decile number five, and as for the first year within decile number one.

As a matter of fact, firms in an abnormal accruals decile as in year t are either new firms (i.e., did not exist as in year t-1) or old firms (i.e., did exist in year t-1) and that also can have two possibilities as firms in year t-1 are either new firms (i.e., did not exist as in year t-2) or old firms (i.e., did exist in year t-2).

The higher the existence of such shares -[i.e., such shares as of share (x) that is originally of a high abnormal accruals decile source in any of previous years; t-2 and t-1]- in decile number one as in year t, the more it is likely to observe lower returns for that decile as these shares are hypothesised to have been involved in income-increasing discretion in the very recent time periods previous to year t (i.e., years t-1 and t-2) and therefore are now being punished by the market after it has realised that it was fooled by the persistence of their performance by the time these companies start to revise their discretion.

We propose that firms in the extreme abnormal accruals deciles (deciles numbers one and two from one side and nine and ten from another side) share disproportionately more companies within the one 36-month-test period. This proposal is supported by:

First, in the related literature it is argued that firms will eventually reverse their discretions, e.g., Dechow et al (1995), and that earnings management all together amount to zero over the all years of firms e.g, Jones (1991).

By this, a complete earnings management cycle can be imagined which consists of two main parts; while the first includes departure for the real underlying performance numbers when firms adopt any of income-increasing or decreasing accounting practices, the second part includes the landing reaction when firms start reversing their previous discretion. Accordingly, this has very important implications regarding our understanding of the lowest abnormal accruals deciles' returns, as observing their negative abnormal accruals numbers can be interpreted as revising of a previously income-increasing discretion and therefore a low (and possibly negative) adjusted return performance can be expected rather than being surprising. Note that this proposal suggests that firms generally have more incentives to adopt income-increasing than income-decreasing decisions as all else equal, earnings and returns are positively correlated.

Second, Sloan (1996, p. 299) shows that for portfolios with extreme accruals most of the mean reversion takes place in the first year, and essentially is complete by the third year. Therefore, we can expect some kind of a disproportional positive relationship between shares within the extreme abnormal accruals deciles if we believe they will revert to their mean incomes as quickly as proposed by Sloan. Put differently, the more accruals discretion is in one direction, the more the reversing discretion in the opposite direction is needed.

Third, a size pattern for the different abnormal accruals deciles has been found in this study as was shown in 6.3.1.3 of chapter six. This pattern is also documented in the related literature by Houge and Loughran (2000), and Sloan (1996). These two studies find the extreme accruals deciles being highly populated with smaller firms in a way fits into a pattern. We in this study do not eliminate the possibility that the accruals-size pattern can relate at least in part to a positive correlation among the same small firms in the same accrual decile levels with opposite discretions.

In the following analysis, shares in both the lowest (1 and 2) and highest (9 and 10) abnormal accruals deciles as in year t are mapped back to their accruals-decile sources in years t-1 and t-2. On the sample level, the analysis is accomplished by accumulating results for the mentioned four deciles over all 23 portfolio formations.

For example, sample (A) contains 3330 firm-years over the 23 portfolio formations. We are particularly interested in mapping 340, 337, 333, and 337 observations for the deciles: 1, 2, 9, and 10, respectively.

For deciles 1 and 2 we want to know how many firms of the overall number of firms in these deciles (i.e., 340, and 337 firms, respectively) come from decile sources nine or/and ten over the previous two years. Similarly, for deciles 9 and 10 we want to know how many firms of the overall number of firms in these deciles (i.e., 333, and 337 firms, respectively) come from decile sources 1 or/and 2 over the previous two years.

In this section, we show how the required numbers as appears in panel (A) of table 7.6 are obtained for just decile 1, as the procedure is essentially the same for the four deciles.

Shares in years t-1 and t-2 as a source for firms joining decile 1 as in year t, are considered independently as appears in panel (A) of table 7.6.

We start with tracing shares in decile 1 as in year t according to their decile-origins in year t-1.

From 340 observations in decile 1 as in year t, we note how many firms join for the first time and how many are old firms (i.e., have previous decile distribution as in year t-1). We find 58 new firms and 282 old firms. We leave the new firms and continue with the old firms. Then, we note how many firms out of 282 used to be in deciles 9 or 10 as in year t-1. These are 72 firms (27 firms form decile 9 and 45 from decile 10). As a percentage this is equal to 25.5%= [72/282]. And so, it has been found that 25.5% of all the shares that join decile 1 in sample (A) as in year t and did exist in year t-1 were tested either in deciles 9 or 10.

TABLE 7.6

SAMPLE SHARES IN DECILES (ONE, and TWO), AND (NINE and TEN) AS IN YEAR t ARE TRACED BACK TO THEIR DECILE ORIGIN IN YEARS t-1 AND t-2.
[PERCENTAGES OF FIRMS THAT JOIN DECILES 1 AND 2 AS IN YEAR t WHILE THEY WERE IN THE HIGHEST ABNORMAL ACCRUALS QUINTILE IN EITHER YEARS t-1 AND/OR t-2, AND PERCENTAGES OF FIRMS THAT JOIN DECILES 9 AND 10 AS IN YEAR t WHILE THEY WERE IN THE LOWEST ABNORMAL ACCRUALS QUINTILE IN EITHER YEARS t-1 AND/OR t-2 ARE PRESENTED IN PANEL (A) OF THIS TABLE. NOTE THAT EXISTING SHARES AS IN YEAR t-1 MAY NOT HAVE BEEN TESTED IN YEAR t-2. HOWEVER, PERCENTAGES OF FIRMS THAT JOIN DECILES 1 AND 2 AS IN YEAR t WHILE THEY WERE IN THE HIGHEST ABNORMAL ACCRUALS QUINTILE IN BOTH YEARS t-1 AND t-2, AND PERCENTAGES OF FIRMS THAT JOIN DECILES 9 AND 10 AS IN YEAR t WHILE THEY WERE IN THE LOWEST ABNORMAL ACCRUALS QUINTILE IN BOTH YEARS t-1 AND t-2 ARE PRESENTED IN PANEL (B). RESULTS ARE PRESENTED FOR SAMPLES (A, B, C, AND D)].

TO READ PANEL (A) BELOW, THE FOLLOWING EXAMPLES ARE GIVEN.
* E.g., these two values should be read as: 25.5% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in year t-1, were in deciles (9 or 10). And 26.8% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in year t-2, were in deciles (9 or 10). ** E.g., these two values should be read as: 25.3% of all the firms that joined decile number ten in year t and did exist (i.e., were tested) in year t-1, were in deciles (1 or 2). And 21.7% of all firms that joined decile number ten in year t and did exist (i.e., were tested) in year t-2, were in deciles (1 or 2).

TO READ PANEL (B) BELOW, THE FOLLOWING EXAMPLES ARE GIVEN.
* E.g., these two values should be read as: 44.4% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in both years t-1 and t-2, were in deciles (9 or 10). And 36.7% of all the firms that joined decile number two in year t and did exist (i.e., were tested) in both years year t-1 and t-2, were in deciles (9 or 10). This percentage is based on different firms. ** E.g., these two values should be read as: 31.9% of all the firms that joined decile number nine in year t and did exist (i.e., were tested) in both years t-1 and t-2, were in deciles (1 or 2). And 38.3% of all the firms that joined decile number ten in year t and did exist (i.e., were tested) in both years year t-1 and t-2, were in deciles (1 or 2). This percentage is based on different firms.

Panel (A): Deciles' (1, 2, 9 and 10) shares in year t are traced back to their decile sources in years t-1, and t-2.

SAMPLE	SOURCE OF FIRMS IS BASED ON YEAR (t-1)				SOURCE OF FIRMS IS BASED ON YEAR (t-2)			
	LOWEST ABNORMAL ACCRUALS QUINTILE DECILES: 1 & 2		HIGHEST ABNORMAL ACCRUALS QUINTILE DECILES: 9 & 10		LOWEST ABNORMAL ACCRUALS QUINTILE DECILES: 1 & 2		HIGHEST ABNORMAL ACCRUALS QUINTILE DECILES: 9 & 10	
	1	2	9	10	1	2	9	10
SAMPLE A	* 25.5%	24.5%	19.4%	** 25.3%	* 26.8%	19.9%	18.1%	** 21.7%
SAMPLE B	25.5%	22.4%	18.8%	26.4%	26.1%	21.4%	19.5%	21.1%
SAMPLE C	24.6%	21.0%	18.8%	25.5%	28.4%	20.5%	18.2%	22.3%
SAMPLE D	25.7%	22.2%	20.0%	26.4%	26.4%	19.6%	19.1%	21.8%

Panel (B): Deciles' (1, 2, 9 and 10) shares in year t are traced back to their decile source over the two years t-1, and t-2, together.

SAMPLE	SOURCE OF FIRMS IS BASED ON BOTH YEARS (t-1), AND (t-2), TOGETHER			
	LOWEST ABNORMAL ACCRUALS QUINTILE DECILES: 1 & 2		HIGHEST ABNORMAL ACCRUALS QUINTILE DECILES: 9 & 10	
	1	2	9	10
SAMPLE A	* 44.4%	* 36.7%	** 31.9%	** 38.3%
SAMPLE B	44.5%	38.6%	34.7%	41.1%
SAMPLE C	44.8%	35.0%	30.4%	40.3%
SAMPLE D	44.6%	36.8%	34.8%	41.1%

Decile's 10 comparable percentage is 25.3%. Such a percentage means that 25.3% of all the shares that joined decile 10 in sample (A) as in year t and did exist in year t-1, were tested within deciles 1 or 2[9].

To a lesser extent shares in decile 9 as in year t are influenced by shares from deciles 1 or 2 as in year t-1. As a percentage, 19.4% of all the shares tested in decile 9 as in year t were tested within deciles 1 or 2 as in year t-1.

We also trace firms in decile 1 as in year t relative to their decile-origin in year t-2. 239 firms out from the 340 observations in decile 1 as in year t did exist and were tested as in year t-2. From these old 239 firms we observe how many used to be in deciles 9 or 10 (specifically as in year t-2). These are *64* firms (27 firms from decile nine and 37 from decile ten, both as in year t-2). As a percentage this is equal to 26.8%= [64/239]. This percentage should be understood as that 26.8% of all the shares that join decile 1 in sample (A) as in year t and did exist in year t-2 were tested either in deciles 9 or 10.

Decile's 10 comparable percentage is 21.7%. Such a percentage means that 21.7% of all the shares that joined decile 10 in sample (A) as in year t and did exist in year t-2, were tested within deciles 1 or 2.

The results of tracing shares in deciles 1, 2, 9, and 10 as in year t, once to their decile-source as in year t-1 and another to their decile-source as in year t-2 show that decile number 1 contains shares from deciles 9 and 10 as in years t-1 of 25.5% and t-2 of 26.8%. These two percentages are higher than comparable percentages of 25.3% and 21.7 for decile number 10, respectively, with the real difference being related to year t-2.

[9] Note that, if joining an abnormal accruals decile as in year t is not conditional on year's t-1 decile-origin, we would expect each of the obtained percentages to be 20% instead 25.5% and 25.3%.

However, testing shares in a decile independently according to their source decile-origin as in years t-1, and t-2 can be confusing as some firms can be considered twice; once in the first percentage regarding year t-1 and another regarding percentage of year t-2.

Panel (B) of table 7.6 shows results of tracing firms in deciles 1, 2, 9, and 10 as in year t, jointly to their decile-origins as in years t-1 and t-2. This test aims to avoid considering a firm twice since percentages in this table are based on the different firms; i.e., if a share in decile 1 was tested twice as in year t-1 and t-2, it will be considered just once.

Results of this panel report percentages of 44.4% and 36.7% of all the firms in deciles 1 and 2, respectively, as in year t conditional on being tested in both years t-1 and t-2, were in deciles 9 and/or 10 compared with just 31.9% and 38.3% of all the firms in deciles 9 and 10, respectively, as in year t conditional on being tested in both years t-1 and t-2, were in deciles 1 and/or 2. Apparently, decile 1 depends heavily on shares tested previously (years t-1 and t-2) within deciles 9 and 10 by about 10% (44.4% - 34.4%) more than what can be expected under a normal distribution theory.

Table 7.7 repeats the tests in table 7.6 with focus given to deciles 1 and 10. Respectively, percentages of firms in deciles 1 and 10 as in year t, while they were classified within deciles 10 and 1 as in year t-1 and year t-2 (independently), are presented in panel (A) of table 7.7. Results for sample (A) show that 16% (15.5%) of all the firms in decile 1 as in year t and did exist in year t-1 (t-2), were tested within decile 10, respectively, compared with 14.6% (14.2%) of all the firms in decile 10 as in year t and did exist in year t-1 (t-2), were tested within decile 1, respectively.

Panel (B) of table 7.7 shows that a percentage of 32.2% of all the firms in decile 1 as in year t and did exist in both years t-1 and t-2, were tested within decile 10, compared with 29.2% of all the firms in decile 10 as in year t and did exist in both years t-1 and t-2, were tested within decile 1.

TABLE 7.7

SAMPLE SHARES IN DECILES ONE, AND TEN AS IN YEAR t ARE TRACED BACK TO THEIR DECILE ORIGIN IN YEARS t-1 AND t-2

[PERCENTAGES OF FIRMS THAT JOIN DECILE 1 AS IN YEAR t WHILE THEY WERE IN THE HIGHEST ABNORMAL ACCRUALS DECILE IN EITHER YEARS t-1 AND/OR t-2, AND PERCENTAGE OF FIRMS THAT JOIN DECILE 10 AS IN YEAR t WHILE THEY WERE IN THE LOWEST ABNORMAL ACCRUALS DECILE IN EITHER YEARS t-1 AND/OR t-2 ARE PRESENTED IN PANEL (A) OF THIS TABLE. NOTE THAT EXISTING SHARES AS IN YEAR t-1 MAY NOT HAVE BEEN TESTED IN YEAR t-2. HOWEVER, PERCENTAGE OF FIRMS THAT JOIN DECILE 1 AS IN YEAR t WHILE THEY WERE IN THE HIGHEST ABNORMAL ACCRUALS DECILE IN BOTH YEARS t-1 AND t-2, AND PERCENTAGES OF FIRMS THAT JOIN DECILES 10 AS IN YEAR t WHILE THEY WERE IN THE LOWEST ABNORMAL ACCRUALS DECILE IN BOTH YEARS t-1 AND t-2 ARE PRESENTED IN PANEL (B). RESULTS ARE PRESENTED FOR SAMPLES (A, B, C, AND D)].

TO READ PANEL (A) BELOW, THE FOLLOWING EXAMPLES ARE GIVEN.

* E.g., these two values should be read as: 16% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in year t-1, were in decile number 10. And 15.5% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in year t-2, were also in decile 10. ** E.g., these two values should be read as: 14.6% of all the firms that joined decile number ten in year t and did exist (i.e., were tested) in year t-1, were in decile number 1. And 14.2% of all the firms that joined decile number ten in year t and did exist (i.e., were tested) in year t-2, were also in decile number 1.

TO *READ PANEL (B) BELOW, THE FOLLOWING EXAMPLES ARE GIVEN.*

* E.g., this percentage of 32.2 should be read as: 32.2% of all the firms that joined decile number one in year t and did exist (i.e., were tested) in both years t-1 and t-2, were in decile number 10. This percentage is based on different firms. ** E.g., this percentage of 29.2 should be read as: 29.2% of all the firms that joined decile number ten in year t and did exist (i.e., were tested) in both years t-1 and t-2, were in decile number 1. This percentage is based on different firms.

Panel (A): Deciles' (1, and 10) shares in year t are traced back to their decile sources in years t-1, and t-2.

SAMPLE	SOURCE OF FIRMS IS BASED ON YEAR (t-1)		SOURCE OF FIRMS IS BASED ON YEAR (t-2)	
	LOWEST ABNORMAL ACCRUALS DECILE	HIGHEST ABNORMAL ACCRUALS DECILE	LOWEST ABNORMAL ACCRUALS DECILE	HIGHEST ABNORMAL ACCRUALS DECILE
	1	10	1	10
SAMPLE A	* 16.0%	** 14.6%	* 15.5%	** 14.2%
SAMPLE B	17.8%	17.5%	16.3%	13.6%
SAMPLE C	15.6%	14.5%	15.2%	12.6%
SAMPLE D	17.5%	17.0%	16.7%	13.0%

Panel (B): Deciles' (1, and 10) shares in year t are traced back to their decile source over the two years t-1, and t-2, together.

SAMPLE	SOURCE OF FIRMS IS BASED ON BOTH YEARS (t-1), AND (t-2), TOGETHER	
	LOWEST ABNORMAL ACCRUALS DECILE	HIGHEST ABNORMAL ACCRUALS DECILE
	1	10
SAMPLE A	* 32.2%	** 29.2%
SAMPLE B	33.8%	30.8%
SAMPLE C	30.8%	27.7%
SAMPLE D	34.2%	29.4%

In summary, the results in tables 7.6 and 7.7 emphasise two important issues. The first concerns the extreme abnormal accruals deciles; 1 and 10, sharing disproportionately higher percentages of the same shares (going back to year t-2) compared with the rest of deciles. Also, decile 2 has been found receiving shares higher than expected from deciles 9 and 10 as in year t-1.

The second important issue is that the lowest abnormal accruals deciles 1 and 2 (mainly because of decile 1) receive from the highest abnormal accruals deciles 9 and 10 more than what they give to the same deciles. This may in part support the expectation that not all the shares within the lowest abnormal accruals deciles should be taken as real underestimators of their incomes (i.e., adopting income-decreasing practices) in favour of shares revising previously made income-increasing decisions.

7.5 Summary

This chapter continued examining the performance and consistency of abnormal accruals anomaly for the UK stock market. In this section, a summary for the estimated adjusted performance for the ten different abnormal accruals deciles is presented. This summary takes account of all results obtained for samples A+B and C+D using all different methods used in this study including those mentioned in chapter six. The current summary, in addition to comparing all different results of estimated deciles' abnormal returns, provides the basis for accepting or rejecting the hypothesises of this study through considering, at the same time, all the evidence from all tests.

First, estimated abnormal returns are reported for the ten abnormal accruals deciles accumulated over 36 months as from portfolio formations, using (1) the market-adjusting method, (2) the size-adjusting method, (3) the B/M-adjusting method, and (4) the S/B/M-adjusting method as appears in table 7.8. Panels [(A/1) and (A/2)] in this table show the estimated performance for sample (A+B) using the equally- and value-weighted methods, respectively. Similarly, panels [(B/1) and (B/2)] show the estimated performance for sample (C+D) using the equally- and value-weighted methods.

Estimated abnormal performance for the different abnormal accruals deciles are coloured in red and blue to highlight statistically significant negative and positive performances at the 5% using two-tailed test, respectively. The cells including negative and positive estimated abnormal returns are framed with red and blue, respectively, when abnormal returns are significant at the 1% using two-tailed test.

In the same table, just underneath the samples' estimated performances using the different methods, abnormal returns for all 10 abnormal accruals deciles are plotted.

Sample's (A+B) estimated abnormal returns using the value-weighted method, apparently show significant negative abnormal returns for the highest abnormal accruals deciles 9 and 10 at the 5% and 1% levels of significance (except for decile 10 using the S/B/M test which is significant only at the 5%). The highest significant negative adjusted return of -22% is earned by decile number 10 using the M.A.R, and the lowest is of -13% using the S/B/M.A.R.

On the other hand, none of the estimated abnormal returns for any of the deciles from the lowest abnormal accruals decile (i.e., decile 1) till decile number 8 using any of the four mentioned methods is statistically different than zero.

Regarding sample (C+D), similar results are observed for deciles 9 and 10 where all the readings for the estimated performance are statistically significant at the 1%, with the highest of -20% for decile 10 using the market-adjusting method, and the lowest is -11% for decile 9 using the B/M-adjusting method.

However, unlike sample (A+B) results of sample (C+D) in panel (B/2) show that decile 1 earns significant negative abnormal returns at the 5% level of significance for two methods; the market-adjusting method of -16% and the size-adjusting method of -13%.

TABLE 7.8

SUMMARY OF ABNORMAL RETURNS FOR DIFFERENT ABNORMAL ACCRUALS DECILES. *(RESULTS ARE SUMMARISED FOR SAMPLES A+B AND C+D ACCUMULATED OVER 36 MONTHS AS FROM PORTFOLIO FORMATIONS USING THE EQUALLY- AND VALUE-WEIGHTED METHODS).*

Estimated abnormal returns are presented using four different methods: (1) market-adjusted returns (M.A.R), (2) size-adjusted returns (S.A.R), book-to-market-adjusted returns (B/M.A.R), and (4) size-and-book-to-market-adjusted returns (S/B/M.A.R). Estimated abnormal returns are presented in panels (A) and (B) for samples (A+B) and (C+D), respectively. panels (A/1) and (A/2) for sample (A+B), and (B/1) and (B/2) for sample (C+D) report estimated adjusted returns using the equally- and value-weighted methods, respectively. All estimated abnormal returns included in the table are plotted just underneath their corresponding results.

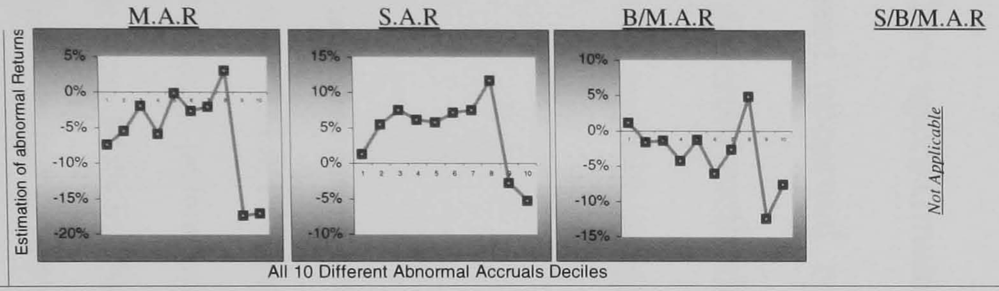
Panel (A): SAMPLE (A+B).

Panel (A/1): Estimated abnormal returns using equally-weighted basis.

Decile		M.A.R	S.A.R	B/M.A.R	S/B/M.A.R
DEC. 1	*	-7%	1%	1%	*Not Applicable*
DEC. 2		-5%	6%	-2%	
DEC. 3		-2%	8%	-1%	
DEC. 4		-6%	6%	-4%	
DEC. 5		0%	6%	-1%	
DEC. 6		-3%	7%	-6%	
DEC. 7		-2%	8%	-3%	
DEC. 8		3%	12%	5%	
DEC. 9		-17%	-3%	-12%	
DEC. 10		-17%	-5%	-8%	
DEC(1-10)		10%	7%	9%	

* A figure of, say, - 7% shuold be interpreted as market-adjusted returns of - 7% for decile 1 in sample (A+B) accumulated over three years as from portfolio formations.

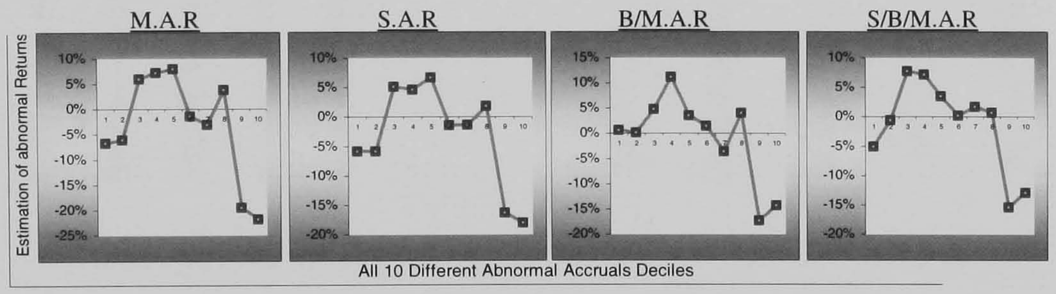
Equally_Weighted Panel (A/1)



Panel (A/2): Estimated abnormal returns using value-weighted basis.

Decile	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R
DEC. 1	-7%	-6%	1%	-5%
DEC. 2	-6%	-6%	0%	-1%
DEC. 3	6%	5%	5%	8%
DEC. 4	7%	5%	11%	7%
DEC. 5	8%	7%	4%	3%
DEC. 6	-1%	-1%	2%	0%
DEC. 7	-3%	-1%	-4%	2%
DEC. 8	4%	2%	4%	1%
DEC. 9	-20%	-16%	-17%	-15%
DEC. 10	-22%	-18%	-14%	-13%
DEC(1-10)	15%	12%	15%	8%

Value_Weighted Panel (A/2)

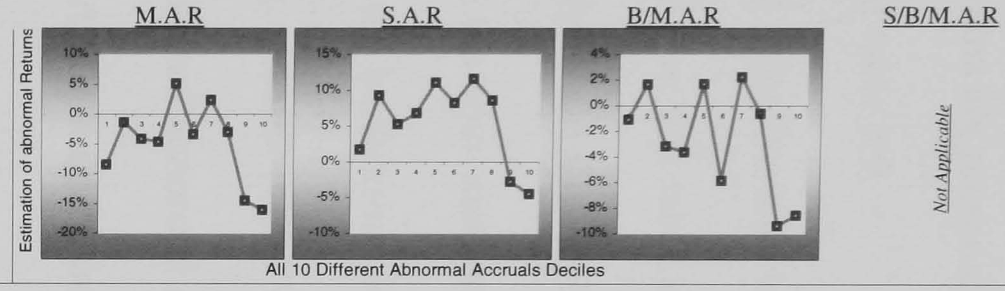


Panel (B): SAMPLE (C+D).

Panel (B/1): Estimated abnormal returns using equally-weighted basis.

Decile	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R
DEC. 1	-8%	2%	-1%	*Not Applicable*
DEC. 2	-1%	9%	2%	
DEC. 3	-4%	5%	-3%	
DEC. 4	-5%	7%	-4%	
DEC. 5	5%	11%	2%	
DEC. 6	-3%	8%	-6%	
DEC. 7	2%	12%	2%	
DEC. 8	-3%	9%	-1%	
DEC. 9	-14%	-3%	-9%	
DEC. 10	-16%	-4%	-9%	
DEC(1-10)	8%	6%	7%	

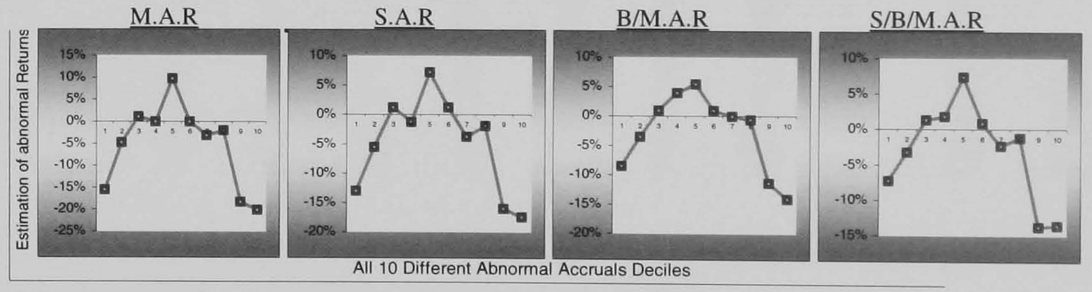
Equally_Weighted Panel (B/1)



Panel (B/2): Estimated abnormal returns using value-weighted basis.

Decile	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R
DEC. 1	-16%	-13%	-9%	-7%
DEC. 2	-5%	-6%	-4%	-3%
DEC. 3	1%	1%	1%	1%
DEC. 4	0%	-1%	4%	2%
DEC. 5	10%	7%	5%	7%
DEC. 6	0%	1%	1%	1%
DEC. 7	-3%	-4%	0%	-2%
DEC. 8	-2%	-2%	-1%	-1%
DEC. 9	-18%	-16%	-11%	-14%
DEC. 10	-20%	-17%	-14%	-14%
DEC(1-10)	4%	4%	6%	6%

Value_Weighted Panel (B/2)



Second, using all methods employed in this study to estimate portfolios' adjusted performance, deciles' estimated abnormal returns are presented annualised for samples (A+B) and (C+D) as appears in panels (A) and (B) of table 7.9.

Results for each sample are reported using equally- and value-weighted methods. Panels [(A/1) and (A/2)] and panels [(B/1) and (B/2)] in this table show the estimated performance for sample (A+B) and (C+D) using the equally- and value-weighted methods, respectively.

Deciles' annual abnormal returns regarding the four methods; the market-adjusting returns (M.A.R), the size-adjusting returns (S.A.R), the book-to-market-adjusting returns (B/M.A.R), and the size-and-book-to-market-adjusting returns (S/B/M.A.R) are approximated by obtaining the arithmetic mean for the three annual abnormal return estimations; i.e., over the first, second, and third 12 months as from portfolio formations.

On the other hand, deciles' annual abnormal returns that are obtained using any of the three CAPM-applications (i.e., Jensen Alpha, the Size- or the B/M-equivalent of Jensen Alpha) and the FF three factor model are approximated by multiplying each of the three monthly estimations of abnormal returns over the first, second, and third years as from formations by 12, then getting the arithmetic mean for the three approximated annualised resulting readings.

Table 7.9 show summaries of the annualised abnormal returns for all the ten abnormal accruals deciles according to the six (eight) different methods used in this study -considering three of them relate to the CAPM- using the equally-weighted (value-weighted methods), respectively[10].

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[10] Note that the annualised estimations in table 7.9 are not accompanied with statistical inferences because they were averaged over just three readings. However, we believe that the statistical inference regarding the approximated annualised abnormal returns is expected to follow that of the estimated abnormal performance for the whole 36-month test periods. That is, if an estimated abnormal return for a specific decile using a specific method (e.g., the M.A.R) is found significant over the whole 36 monthly test periods as appears in table 7.8 we would infer that the approximated annualised abnormal return (table 7.9) for that decile using the same method is significant.

TABLE 7.9

SUMMARY OF APPROXIMATED ANNUALLY ABNORMAL RETURNS FOR ALL 10 DIFFERENT ABNORMAL ACCRUALS DECILES USING ALL METHODS EMPLOYED IN THIS STUDY. *(EQUALLY- AND VALUE-WEIGHTED AVERAGES FOR SAMPLES: (A+B) AND (C+D) ARE REPORTED).*

Approximated annual abnormal returns for samples (A+B) and (C+D) under the equally-weighted basis are presented according to six methods: the market-adjusted returns (M.A.R), the size-adjusted returns (S.A.R), the B/M-adjusted (B/M.A.R), the CAPM-Jensen Alpha (α_p), the CAPM-size-equivalent of Jensen Alpha ($S\alpha_p$), and finally, the CAPM-B/M-equivalent of Jensen Alpha ($B/M\alpha_p$). Using the value-weighted method, deciles' annualised abnormal returns are approximated for eight different methods; these are the size-and-book-to-market-adjusted returns (S/B/M.A.R), the FF three factor model, in addition to those six methods used under the equally-weighted basis. Except for the CAPM and the FF three factor model, deciles' annual abnormal returns are approximated by taking the arithmetic mean of estimated abnormal returns over the first, second, and third 12 months as from portfolio formations. Regarding the CAPM and the FF model, annualised abnormal returns are estimated on two steps: first, monthly estimated returns over the first, second, and third 12 months are approximated on annual basis by multiplying each by 12. Then, an arithmetic mean for the three annualised estimations is obtained. All six (eight) averages of approximated annual abnormal returns using the equally-weighted (value-weighted) basis are averaged by considering their arithmetic mean (in bold).

Panel (A): SAMPLE (A+B).

Panel (A/1): Estimated abnormal returns using equally-weighted basis.

	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R	α_p	$S\alpha_p$	$B/M\alpha_p$	FF	* New estimation of abnormal returns
DEC. 1	-3.28%	-0.68%	-0.59%		-3.26%	-0.84%	-1.78%		**-1.74%**
DEC. 2	-1.20%	1.23%	0.02%		-0.19%	1.85%	-0.05%		**0.28%**
DEC. 3	-1.63%	0.80%	-0.85%		0.53%	2.01%	0.00%		**0.14%**
DEC. 4	-2.33%	0.43%	-1.39%		-0.08%	1.70%	-0.04%		**-0.28%**
DEC. 5	-0.97%	0.73%	-0.62%	*Not Applicable*	0.78%	2.08%	-0.19%	*Not Applicable*	**0.30%**
DEC. 6	-1.08%	1.15%	-1.36%		1.47%	2.72%	0.37%		**0.54%**
DEC. 7	-1.72%	0.77%	-1.08%		0.01%	1.43%	-0.47%		**-0.18%**
DEC. 8	-0.10%	2.03%	0.67%		0.38%	2.01%	0.15%		**0.86%**
DEC. 9	-4.44%	-1.00%	-2.85%		-3.47%	-0.93%	-3.06%		**-2.62%**
DEC. 10	-5.09%	-1.97%	-2.18%		-3.76%	-1.28%	-2.07%		**-2.73%**
DEC(1-10)	1.81%	1.29%	1.59%		0.50%	0.43%	0.29%		**0.99%**

A figure of say -3.28% is obtained by averaging the three M.A.R figures (-0.04, -0.03, and -0.03) from table 6.3.5.
Also, a figure of, say, -1.74% in bold, is obtained by averaging all parallel estimated values to the left of this figure. Therefore, this figure is a crude estimation of abnormal returns based upon all different methods used for adjusting returns, and so, it means estimated annual abnormal returns of 1.74% for decile 1.

Panel (A/2): Estimated abnormal returns using value-weighted basis.

	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R	α_p	$S\alpha_p$	$B/M\alpha_p$	FF	* New estimation of abnormal returns
DEC. 1	-1.78%	-1.47%	-0.17%	-1.14%	-3.16%	-2.73%	-1.59%	-4.77%	**-2.10%**
DEC. 2	-2.02%	-1.77%	-0.53%	-0.45%	-1.91%	-1.80%	-0.88%	-2.67%	**-1.50%**
DEC. 3	0.83%	0.77%	1.05%	1.70%	0.26%	0.14%	-0.04%	-0.33%	**0.55%**
DEC. 4	0.99%	0.26%	2.14%	1.24%	0.92%	0.43%	1.36%	0.58%	**0.99%**
DEC. 5	0.69%	0.38%	0.03%	-0.10%	1.12%	0.97%	-0.13%	1.44%	**0.55%**
DEC. 6	0.59%	0.64%	1.62%	1.15%	0.61%	0.75%	1.14%	0.14%	**0.83%**
DEC. 7	-0.32%	0.20%	-0.46%	1.00%	0.23%	0.66%	-0.60%	0.69%	**0.17%**
DEC. 8	0.10%	-0.37%	0.65%	-0.21%	0.37%	0.17%	0.73%	-0.01%	**0.18%**
DEC. 9	-4.53%	-3.84%	-3.81%	-3.63%	-3.95%	-3.38%	-3.43%	-4.63%	**-3.90%**
DEC. 10	-5.52%	-4.52%	-3.48%	-3.24%	-4.79%	-3.89%	-2.97%	-5.85%	**-4.28%**
DEC(1-10)	3.74%	3.05%	3.31%	2.10%	1.63%	1.16%	1.37%	1.07%	**2.18%**

Panel (B): SAMPLE (C+D).

Panel (B/1): Estimated abnormal returns using equally-weighted basis.

	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R	α_p	$S\alpha_p$	$B/M\alpha_p$	FF	* New estimation of abnormal returns
DEC. 1	-3.08%	-0.27%	-0.90%		-3.85%	-1.24%	-2.38%		**-1.95%**
DEC. 2	-0.70%	2.04%	0.45%		-0.08%	2.18%	0.31%		**0.70%**
DEC. 3	-1.45%	0.79%	-0.96%		0.38%	1.78%	-0.10%		**0.07%**
DEC. 4	-1.77%	0.90%	-1.09%		0.15%	1.95%	-0.03%		**0.02%**
DEC. 5	0.30%	1.99%	0.11%	*Not Applicable*	1.22%	2.44%	0.16%	*Not Applicable*	**1.04%**
DEC. 6	-1.06%	1.90%	-1.22%		1.33%	2.92%	0.30%		**0.70%**
DEC. 7	-0.16%	2.17%	0.33%		1.23%	2.60%	0.71%		**1.15%**
DEC. 8	-1.06%	1.86%	-0.08%		-0.05%	1.90%	-0.03%		**0.42%**
DEC. 9	-3.77%	-0.88%	-2.22%		-3.59%	-1.20%	-2.87%		**-2.42%**
DEC. 10	-4.72%	-1.68%	-2.46%		-3.93%	-1.33%	-2.49%		**-2.77%**
DEC(1-10)	1.64%	1.41%	1.57%		0.09%	0.08%	0.11%		**0.82%**

Panel (B/2): Estimated abnormal returns using value-weighted basis.

	M.A.R	S.A.R	B/M.A.R	S/B/M.A.R	α_p	$S\alpha_p$	$B/M\alpha_p$	FF	* New estimation of abnormal returns
DEC. 1	-3.50%	-2.76%	-1.70%	-1.16%	-3.56%	-2.99%	-1.86%	-5.43%	**-2.87%**
DEC. 2	-1.13%	-1.30%	-0.42%	-0.53%	-1.31%	-1.67%	-0.75%	-1.92%	**-1.13%**
DEC. 3	-1.08%	-0.94%	-0.67%	-0.79%	-0.75%	-0.66%	-0.47%	-1.48%	**-0.86%**
DEC. 4	-0.88%	-1.22%	0.36%	-0.05%	-0.47%	-0.72%	0.08%	-0.71%	**-0.45%**
DEC. 5	1.82%	1.15%	1.10%	1.39%	1.76%	1.23%	0.71%	1.88%	**1.38%**
DEC. 6	-0.01%	0.44%	0.35%	0.57%	0.42%	0.80%	0.29%	0.39%	**0.41%**
DEC. 7	-0.44%	-0.58%	0.12%	-0.06%	0.33%	0.19%	0.42%	0.52%	**0.06%**
DEC. 8	-0.72%	-0.68%	-0.24%	-0.32%	-0.53%	-0.52%	-0.26%	-1.23%	**-0.56%**
DEC. 9	-4.52%	-3.98%	-2.66%	-3.39%	-3.95%	-3.55%	-2.25%	-4.59%	**-3.61%**
DEC. 10	-4.83%	-4.19%	-3.28%	-3.25%	-4.69%	-4.16%	-3.18%	-5.37%	**-4.12%**
DEC(1-10)	1.33%	1.43%	1.58%	2.09%	1.14%	1.17%	1.32%	-0.06%	**1.25%**

We also perform a crude estimation of the deciles' adjusted returns through averaging all readings of abnormal returns obtained from the six (eight) estimations for the one decile, using the equally-weighted (value-weighted method), respectively.

Approximated value-weighted annual abnormal returns for the 10 different abnormal accruals deciles in samples (A+B) and (C+D) are presented in panels (A/2) and (B/2) of table 7.9.

Regarding sample (A+B), approximated annual abnormal returns for decile 10 ranges from -5.85% to -2.97% as follows: [-5.85% using the FF, -5.52% using the M.A.R, -4.79% using the α_p, -4.52% using the S.A.R, -3.89% using the $S\alpha_p$, -3.48% using the B/M.A.R, -3.24% using the S/B/M.A.R, and -2.97% using the $B/M\alpha_p$]. On the other hand, approximated annual abnormal returns for decile 1 range from -4.77% to -0.17% as follows: [-4.77% using the FF, -3.16% using the α_p, -2.73% using the $S\alpha_p$, -1.78% using the M.A.R, -1.59% using the $B/M\alpha_p$, -1.47% using the S.A.R, -1.14% using the S/B/M.A.R, and -0.17% using the B/M.A.R].

Lower annualised adjusted returns for decile 1 are obtained by the FF and the CAPM compared with the rest of methods as this decile has been found to have relatively high loadings on the market proxy.

All estimated annualised abnormal returns for the hedge portfolio are positive though insignificant, with the highest of 3.74% for the M.A.R and the lowest of 1.07% for the FF, as follows: [3.74% using the M.A.R, 3.31% using the B/M.A.R, 3.05% using the S.A.R, 2.10% using the S/B/M.A.R, 1.63% using the α_p, 1.37% using the $B/M\alpha_p$, 1.16% using the $S\alpha_p$, and 1.07% using the FF].

Regarding sample (C+D), approximated annual abnormal returns for decile 10 range from -5.37% to -3.18% as follows: [-5.37% using the FF, -4.83% using the M.A.R, -4.69% using the α_p, -4.19% using the S.A.R, -4.16% using the $S\alpha_p$, -3.28% using the B/M.A.R, -3.25% using the S/B/M.A.R, and -3.18% using the $B/M\alpha_p$]. On the other hand, approximated annual abnormal returns for decile 1 range from -5.43% to -1.16% as follows: [-5.43% using the FF, -3.56% using the α_p, -3.50% using the M.A.R, -2.99% using the $S\alpha_p$, -2.76% using the S.A.R, -1.86% using the $B/M\alpha_p$, -1.70% using the B/M.A.R , and -1.16% using the S/B/M.A.R].

All estimated annualised abnormal returns for the hedge portfolio are positive except for the FF test, with the highest of 2.09% and the lowest of -0.06%, as follows: [2.09% using the S/B/M.A.R, 1.58% using the B/M.A.R, 1.43% using the S.A.R, 1.33% using the M.A.R, 1.32% using the $B/M\alpha_p$, 1.17% using the $S\alpha_p$, 1.14% using the α_p, and -0.06% using the FF].

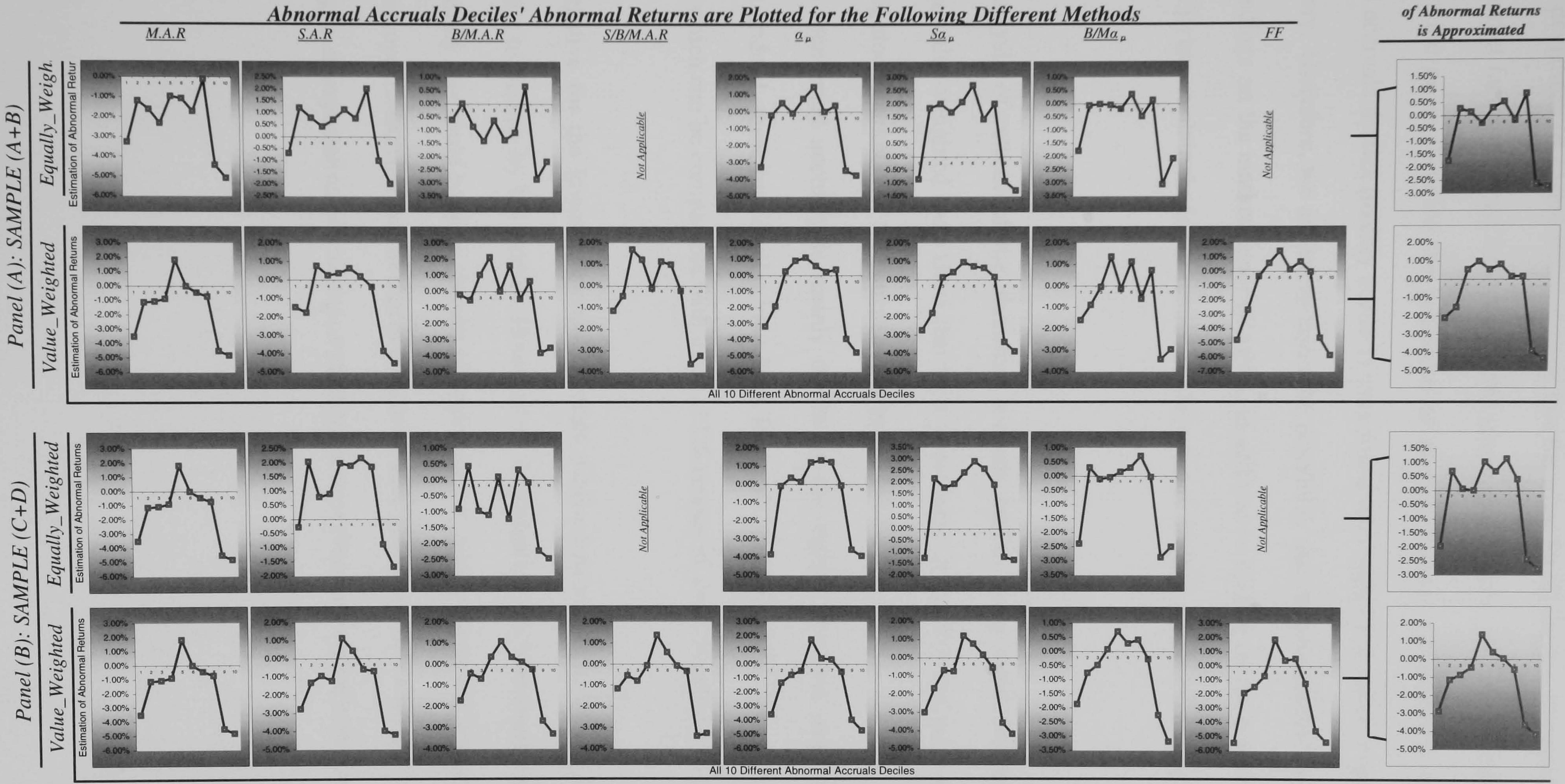
Therefore, we note that while both are insignificant higher positive annualised abnormal returns are estimated for the arbitrage portfolio in sample (A+B) compared with those on the same portfolio in sample (C+D). The difference can be the result of two issues, the first is that sample (C+D) includes more shares than (A+B) with different returns, and the second concerns the starting date for measuring returns. More specifically, sample (A+B) includes shares from the two quarterly samples (A) and (B), while sample (C+D) contains shares from the two semi-annual samples (C) and (D). Consequently, if we to believe that the difference in the annualised abnormal returns on the arbitrage portfolios in samples (A+B) and (C+D) relates to the starting date for measuring returns (i.e., the second reason) more than to the different shares exclusively in sample (C+D), we would expect that results of sample (A+B) reflects the market reaction to the abnormal accruals decision more accurately than sample (C+D).

Deciles' approximated annualised abnormal returns in table 7.9 are plotted in figure 7.1. Moving from decile number one to decile 10, an apparent annualised abnormal return pattern can be observed. All the figures for all the methods, using both the equally- and the value-weighed basis indicate an inverted "U", with the lowest returns for deciles 9 and 10, i.e., the highest abnormal accruals deciles, followed by returns on decile 1.

FIGURE 7.1

APPROXIMATED ANNUAL ABNORMAL RETURNS FOR ALL 10 DIFFERENT ABNORMAL ACCRUALS DECILES IN SAMPLES A+B AND C+D AS APPEARS IN TABLE 7.9 USING THE EQUALLY- AND VALUE-WEIGHTED METHODS ARE PLOTTED IN THIS FIGURE. *(A NEW ESTIMATION OF DECILES' ABNORMAL RETURNS BASED ON AVARAGING ALL ABNORMAL RETURNS OBTAINED BY THE INDIVIDUAL METHODS IS ALSO CALCULATED).*

For meanings of abbreviations, e.g., M.A.R, and method used to approximate different deciles' annual abnormal returns, please refer to table 7.9.



Note that all percentages of deciles' abnormal returns plotted in this figure have been brought from table 7.9, and therefore should be interpreted in the same way they were interpreted in the mentioned table.

Portfolio standard deviations (σ_p) were found more or less the same for all deciles. Moreover, loadings on the market factor obtained from the CAPM (three applications) and the FF three factor models provide no explanation for behaviour of deciles' returns. Consistently, the extreme abnormal accruals deciles (mainly decile 1) were found with higher regression slopes on the market proxy. Therefore, we are led to reject the possibility that common factor risks summarised in loadings on the market factor (CAPM), in addition to loading on the size and B/M factors (the FF) can explain the lower returns on the extreme deciles; mainly deciles 1, 9, and 10.

In conclusion, analysis of returns of the abnormal accruals deciles using eight different methods under the value-weighted basis show that there is evidence of an abnormal accruals anomaly in the UK stock market over the entire sample period (1979-2005).

Furthermore, the mentioned anomaly is mainly driven by the highest abnormal accruals deciles 9, and 10. Indeed, these two deciles have been found producing significant negative abnormal returns which can be comparable with those of US studies of about negative (4-5)% per annum.

Returns being negative for the lowest abnormal accruals deciles (mainly decile 1) can be considered opposite to finding by US studies. However, an investigation has been conducted to know why possibly this could happen. Results indicate that the extreme abnormal accruals deciles share a disproportionate number of shares compared with what they share with the rest of deciles, leading to an expectation of lower returns on the lowest abnormal accruals deciles.

CHAPTER EIGHT

CONCLUSIONS

8.1 Introduction

Standard setters insist that the accrual accounting basis is required to increase the benefits of the financial reporting system. On the other hand, accruals are documented to be noisy signals of future performance of an enterprise.

An accumulation of considerable empirical evidence suggests that the generality of share investors are not sophisticated enough to distinguish between the implications of current operating cash flow and those of current operating accruals on share prices, leading to the commitment of cognitive errors.

This debate was first systematically studied by Sloan (1996) who observed irrational investor behaviour as investors price current components of income failing to consider the transitory nature of accruals and the long run persistence of cash flows.

Even more intriguing analysis reveals that it is abnormal accruals and not normal accruals that cause total accruals to noisily signal a firm's future performance. Researchers such as Sloan improperly generalise that accruals taken as a total is of low quality (i.e., is of low persistence) compared with cash flows. Share investors, on average, overestimate and therefore overprice abnormal accruals but do not materially misprice normal accruals, Xie (2001).

Consequently, innovative research has been undertaken proposing that an abnormal accruals hedge portfolio, by taking a long position in the lowest abnormal accrual portfolio and taking an offsetting short position in the highest abnormal accrual portfolio, can capture the anomaly. It is thought this is caused by investors anchoring on earnings, neglecting the information content of its components. The market eventually reacts more favourably the larger (the smaller) are cash flows and normal accruals (abnormal accruals).

Surprisingly, such a simple trading strategy based on public accounting data, has been found producing sustainable abnormal returns, even after controlling for a variety of well-known "risk factors", e.g., beta, the size effect, and the book-to-market equity.

Despite the efforts made by researchers in trying to establish the factors that contribute to abnormal accruals strategy profitability, mainly in US studies, the issue is still open. This provided the inspiration to investigate the anomaly employing UK firm data over an extended period of time starting January 1968 and ending June 2005.

8.2 Summary of Main Research Findings

Averages of buy-and-hold abnormal returns are estimated for sample deciles formed on the basis of abnormal accruals scaled by the lagged total assets. Results are reported for four main samples (A, B, C, and D). These samples are constructed based on the quarter of the year during which the different companies publish their accounts, to evaluate the effect of the accounting data on the share price as soon as possible after the financial year-end. Moreover, results of the two main quarterly samples (A&B) together and the two semi-annual samples (C&D) together are also summarised on the basis of averaging their 46 annual adjusted returns.

Sample returns are adjusted using benchmark approaches. These approaches for estimating the samples' abnormal returns include the reference benchmark approach, through using returns on the market-index, and the matching benchmark approach, implying using returns on any of size control, book-to-market control, or size-and-book-to-market control portfolios.

To evaluate the robustness of any conclusions as to whether the abnormal accrual anomaly represents the prevailing situation in the market versus being merely a risk premia, a further risk analysis for the decile portfolios formed on the basis of abnormal accruals is conducted employing regression approaches. Two types of regressions are estimated; the first is the CAPM and the second is the Fama and French (1993) three factor model.

In conclusion, and based on all the tests performed by this thesis, we show evidence of the abnormal accruals anomaly in the UK stock market over the entire sample test period 1979-2005.

Furthermore, the anomaly is found to be driven mainly by the highest abnormal accruals deciles 9, and 10, producing negative abnormal returns of about 4-5% per annum.

On the other hand, contrary to findings by the majority of US studies documenting significant positive adjusted returns, the lowest abnormal accruals decile (i.e., decile 1) produces, on average, insignificant negative adjusted returns. However, this issue has been explored. Results indicate that the extreme abnormal accruals deciles (10 and 1) share a disproportionate number of shares compared with what they share with the rest of deciles leading to an expectation of lower returns on the lowest abnormal accruals deciles.

8.3 Contribution of the Research

This thesis has made a number of significant contributions as follows.

First, as far as we know, no other research has investigated the role of abnormal accruals in UK share prices. Therefore, this study improves our understanding and awareness of the accrual anomaly, generally documented by US research, employing UK firm data over a long period starting from January 1968 to June 2005.

Second, this study has contributed to methodological developments in the field of efficient market studies. A fairly sophisticated methodology has been adopted exploring the abnormal accruals phenomenon through using monthly share market capitalisations to estimate portfolios' returns under the value-weighted-basis for calculating returns as opposed to committing the calculations to the share market capitalisations as at the portfolios' formation dates.

Third, another methodological innovation, to avoid potential distortion resulting from the problem of the "new-listing" bias on the sample deciles' market-adjusted return calculations, this study creates a specific market-index for each of the 92 abnormal accruals formation dates included in this study.

Fourth, this study innovates by making use of three forms of the CAPM. Samples' abnormal accruals Jensen alpha, are used as well as another two applications of the CAPM (we are not aware of any other research that has used them before). The first and second new applications of the CAPM require estimating the equivalent of Jensen alpha but when (i) size-control returns and (ii) book-to-market-control returns are used instead of returns on the market as independent variables in the CAPM equation, respectively. Furthermore, equally- and value-weighted methods are used to estimate regressions of the three CAPM applications.

8.4 Limitations and Further Research

The time-series application of the Modified Jones Model has received criticism from many researchers as the model estimates abnormal accruals with considerable imprecision, as was mentioned in section 3.4 of chapter three. Dechow et al. (1995) themselves document that their model is of low power when applied to a random sample of companies, and does not appear well specified when applied to a random sample of companies with extreme financial performance defined as both earnings and cash flows.

Moreover, reducing the number of firms in the sample, considering parameters of the model as constant over the one regression period, in addition to suffering from sample selection bias due to the focus on well-established companies with relatively high market capitalisation, rather than the generality of the firms in the market, can be held against the time-series application of the MJM. However, regarding the sample selection bias, our tests indicate a very small difference in returns between the samples and their market indices of about 1% annually.

From another aspect, the existing earnings management literature is incapable of accurately testing the different implications of the abnormal accruals compositions, because it is still far away from tracing abnormal accruals to their real causes. Therefore, we suggest further research aiming to construct earnings management models to predict the quality of abnormal accruals based on whether these accruals are the result of income smoothing or signalling value-relevant new information about future earnings of a firm as opposed to misleading some stakeholders about the underlying economic performance of the company, i.e. fraud. The thrust of such research is to decompose abnormal accruals themselves into subcomponents; each of them perhaps has a different level of persistency leading to different share price implications.

Also, it would be useful to repeat the tests on a cross-sectional basis (as an alternative to the time-series basis), as this will enhance our awareness and understanding of the accrual anomaly by providing direct comparisons between the results of the two competing counterparts; the time-series and cross-sectional applications.

8.5 Conclusion

This thesis conducts a comprehensive examination of the profitability and consistency of the accounting abnormal accruals anomaly in UK firms over an extended period from January 1968 to June 2005.

The evidence in our research is consistent with the view that investors irrationally over-price shares with high accruals at the time of (or shortly after) the announcement of earnings results. The implication is that investors fail to price sufficiently into high accrual companies the lower quality of earnings represented by high accruals (rather than high cash flows or normal accruals). This leads to over optimism for high accrual firms which later dissipates, resulting in these shares underperforming the market over the subsequent three years. This fits with the evidence in the literature that suggests a lower persistence of the abnormal accrual component of income performance. That is, high abnormal accruals tend to be transitory in nature. The extent of the transitory nature is not fully appreciated by investors around earnings announcement dates, leading to the highest abnormal accruals decile being overvalued and then producing sub-normal returns over the subsequent years. This supports the literature view that the investor fixates on income without paying due attention to the extent to which earnings come from abnormal accruals, normal accruals or cash flow.

A variety of tests were employed for purposes ranging from: (i) exploring the robustness of the accruals anomaly through adjusting returns of sample portfolios by returns on broad market portfolios, returns on size-control portfolios, returns on book-to-market control portfolios, and returns on size-and-book-to-market control portfolios. (ii) Investigating potential explanations for the anomaly in terms of the market risk surrogated by beta, size, book-to-market equity, deletions and liquidation ratios, and year by year reliability tests.
Portfolio returns are estimated using equally- and value-weighted methods, with the value-weighted basis being continuously changed to the monthly share market capitalisations after considering the related rates of return and potential share reinvestments.

Overall, we document a significant abnormal accruals anomaly in UK firms in the highest abnormal accruals decile with significant negative abnormal returns over three years of about 4-5% per annum. On the other hand, the lowest abnormal accruals decile has been found producing abnormal returns that is statistically indistinguishable from zero. The results are robust to all the tests performed in this thesis including the CAPM and the Fama and French's (1993) three factor model.

A further analysis reveals that the extreme abnormal accrual deciles, i.e., the lowest and the highest deciles, share disproportionately higher percentages of shares than what they share with the rest of deciles. Subsequently, we believe that not observing significant positive abnormal returns for the lowest abnormal accrual decile, as generally documented by US studies, is due to the fact that a significant proportion of the firms being tested within the highest abnormal accrual decile with expected negative abnormal returns can at the same time be tested within the lowest decile.

Consequently, the implication of this study is that investors might choose to short sell those shares in the highest abnormal accruals decile or, alternatively, to avoid buying them if they wish to avoid performance less than the market returns.

An attempt has been made to make this piece of work inclusive to all the possible explanations for the abnormal accruals phenomenon and we hope that this modest effort has convinced the reader that it is worthwhile, provides additional insight into the abnormal accruals anomaly, and highlights the opportunity for promising future research in this area.

APPENDIX 1

NAMES OF DIFFERENT COMPANIES INCLUDED IN THE

FOUR SAMPLES (A, B, C, And D)

APPENDIX 1.1

NAMES OF DIFFERENT COMPANIES INCLUDED IN SAMPLE (A)

This appendix shows the names and unique codes (G1: as given by LSPD) for 435 different firms included in sample (A). These firms publish their accounts within the first quarter of the year (i.e., Jan.- Mar.). This appendix includes two pages.

4	AAH plc	1453	Cropper(James)Co.	2505	HIGHAMS LIMITED
32	ACROW LTD	1455	CROSBY WOODFIELD LTD	2536	HINTON(AMOS)& SONS
48	AERO & GEN. INSTRUMENT	1465	CROUCH GROUP	2556	Hollas Group
60	AIRFIX INDS.LTD.	1470	CROWN HOUSE PLC	2561	PERGAMON AGB PLC
89	ALLEN(W.G.)& SONS TIPTON	1479	G.B. PAPERS PLC	2591	Carbo plc
98	Allied Domecq Holdings	1483	CURRYS GRP PLC	2613	HOWARD TENENS SVS
101	Allied Colloids Group plc	1532	Davy Corporation plc	2640	HUMPHRIES HOLDINGS
152	Amber Industrial Holdings pl	1539	Dawson International	2671	ILLINGWORTH MORRIS
168	ANDERSON STRATHCLYDE	1542	De La Rue Co	2678	IMPERIAL CONT GAS ASSN
227	Aquascutum Grp plc	1547	DEBENHAMS LIMITED	2688	DURAPIPE INTERNATIONAL
243	ARLINGTON MOTOR	1551	DECCA LTD	2709	INITIAL PLC
247	ARMITAGE SHANKS GRP	1557	Ingenta plc	2723	INTERNATIONAL PAINT PLC
310	ASSOCD COMM CRP PLC 'A'	1567	DENNIS(JAMES H) PLC	2730	INTERNATIONAL TIMBER PLC
311	ASSOCD TELECOMMINICATIOI	1579	DERITEND STAMPING	2757	Jacks(William) plc
316	Atkins Group plc	1591	Dewhirst plc	2813	Johnson Matthey plc
352	AVANA GROUP LTD.	1614	DISTILLERS CO.LTD.	2829	Jones Stroud (Hldgs)
374	BPB plc	1618	DIXON (D) GROUP PLC	2991	L.C.P.HOLDINGS
398	BAKER PERKINS	1635	DOM HLDGS LTD	2992	London International Group
468	BASSETT FOODS	1656	Douglas (R.M.) (Hdgs.)	3046	Latham (James) plc
487	Beattie (James) plc	1663	Dowty Group plc	3069	TRENT HOLDINGS PLC
505	Smithkline Beecham	1691	Dunhill Hldgs plc	3096	LENNONS GROUP
508	BEECHWOOD GROUP PLC	1698	Duport Ltd	3100	LESNEY PRODS.
535	Bentalls plc	1708	E.R.F.(Holdings)	3116	Liberty plc
552	BERISFORDS GROUP	1713	EARLY'S OF WITNEY PLC	3158	LLOYD (F.H.) HLDS.
573	BEVAN(D.F)HOLDINGS	1724	EMAP plc	3167	Locker Group plc
632	KINGSLEY & FORRESTER	1746	Edbro	3211	LONDON & MIDLAND INDS
637	Bogod Group plc	1761	Safeway plc	3248	LONGTON INDUST HLDG
655	Boots Group plc	1778	Electrocomponents plc	3306	Glenmorangie plc 'A LVR'
656	BORDER BREWS.(WREXHAM)	1779	ELECTRONIC RENTALS	3384	Mansfield Brewery plc
707	Breedon plc	1781	Novo Group plc	3400	Marks & Spencer Group
716	BRICKHOUSE DUDLEY	1786	Elliott (B) plc	3404	Marling Inds
734	Bristol United Press plc	1789	ELLIOTT GRP PETERBOROUGI	3417	Marshalls plc
761	Powerscreen International	1792	ELLIS & GOLDSTEIN	3419	Marston Thompson
764	British Bldg & Eng Appl plc	1799	Elswick plc	3454	MAY & HASSELL LTD.
773	BARHAM GROUP PLC	1800	Elys(Wimbledon) plc	3462	MEAT TRADE SUPPLIERS
782	BET	1805	Empire Stores Grp plc	3485	Mentmore plc
792	BRITISH HOME STORES	1806	BRENGREEN (HLDGS) PLC	3486	Menzies (John) plc
807	WILKINSON MATCH	1822	Tootal Group	3524	MEYER(M.L)PLC
832	BSS Group plc	1849	Erskine House Group plc	3554	MILLER(F)(TEXTILE)
836	BTP	1876	BEREC GROUP	3572	Birmingham Mint
869	BROTHERHOOD (P) LTD	1884	EXTEL GROUP	3574	Norton Group plc
874	Bandt plc	1915	Premier Farnell plc	3579	MITCHELL,SOMERS
878	Brown(N) Group plc	1938	FIDELITY PLC	3593	WARNER HOLIDAYS
883	BROWN(JOHN) PLC	1946	Findel plc	3594	MONK(A.)& CO.LTD.
892	Ashdene Group plc	1958	Hyder Consulting plc	3607	Yorklyde plc
901	BUCKLEY'S BREWERY PLC	2010	Forminster plc	3614	Morgan Crucible
920	Elektron plc	2014	Fortnum & Mason	3626	Morrison (Wm) Supermarkets
923	BULMER & LUMB (HLDGS)	2022	Foster(John) & Son plc	3631	MOSS(ROBERT) LTD
942	BURT,BOULTON HLDGS	2046	FREEMANS (LONDON SW9)	3632	Moss Bros Group plc
949	Burtonwood plc	2096	GARFORD-LILLEY INDS	3692	NCC ENERGY LTD
963	BUTTERFIELD-HARVEY	2099	GARNER BOOTH LTD	3707	Neepsend plc
987	Caffyns plc	2117	GELFER(A.& J.)	3754	Newmark(L) plc
1043	CAPPER-NEILL LTD.	2121	GEI International	3776	Norcros plc
1049	Carclo plc	2124	Marconi Corporation plc	3808	Northern Foods
1054	CARLESS PLC	2146	Gieves & Hawkes plc	3829	NOVA(JERSEY)KNIT
1058	CARLTON INDS PLC	2151	GILTSPUR INVESTMENTS	3901	OWEN OWEN LIMITED
1098	CAWOODS HLDGS. LTD	2172	GLOSSOP PLC	3949	Parkland Group plc
1136	CHAMBERLAIN PHIPPS	2198	Video Store Group plc	3967	PATERSON JENKS PLC
1145	CHAPMAN INDUSTRIES PLC	2202	GORDON & GOTCH	3974	PAULS PLC
1181	Chloride Group plc	2217	Graig Shipping plc	3995	PEGLER-HATTERSLEY
1184	CHUBB & SONS LTD.	2233	GRATTAN P L C	4024	PETBOW HLDGS LTD
1263	COALITE GROUP	2316	H.A.T.GROUP LTD.	4028	WARING & GILLOW
1269	COCKSEDGE (HLDGS)	2356	Halma plc	4040	PHILLIPS PATENTS
1275	Six Hundred (600) Group	2369	Hampson Industries plc	4047	Phoenix Timber Grp plc
1303	COMBEN GROUP	2390	HARGREAVES GROUP	4061	Pilkington plc
1308	COMBINED ENGLISH STORES	2420	HARTWELL PLC	4079	PLESSEY CO PLC
1355	Continuous Stationary	2441	Hazlewood Foods plc	4081	Plysu plc
1364	Cook(William) plc	2447	HEAL & SON HLDGS.	4106	Powell Duffryn plc
1365	CI Group plc	2466	HENDERSON GRP PLC	4202	R.F.D.GROUP PLC
1393	European Colour plc	2478	Next plc	4204	Racal Electronics plc
1402	COUNTRY GENTS ASS PLC	2487	HESTAIR PLC	4206	Radiant Metal Finishing
1406	Courts plc	2493	Hewden Stuart plc	4241	Ransom (William) & Son
1408	Courtaulds plc	2496	Hicking Pentecost	4248	Signet Group plc
1413	C H Industrials	2502	HIELD BROTHERS LTD	4251	RAYBECK LTD.

Appendix 1.1 continued

4255	Chapelthorpe plc	5633	WILKINS & MITCHELL	7076	Real Time Control plc
4258	REARDON SMITH LINE	5662	WILSON BROS.LTD.	7091	Oxford Instruments plc
4266	REDIFFUSION LTD.	5706	Wyndeham Press Group plc	7104	French Connection Group
4276	Austin Reed Group plc	5712	WOODHEAD(J.)& SONS	7127	Gibbs Mew plc
4289	Reed Elsevier plc	5719	Kingfisher plc	7132	CML Microsystems plc
4298	Renold plc	5726	Worthington Group plc	7155	Scantronic Hldgs plc
4302	RENWICK GROUP	5791	ASSOCD. LEISURE	7163	Body Shop Intnl plc
4311	Rexmore plc	6009	Ferguson International Hldgs	7197	Etam plc
4362	ROBERTSON FOODS	6013	Silentnight Hldgs plc	7216	Tinsley(Eliza)Group plc
4405	ROTAPRINT LIMITED	6036	NORTON OPAX PLC	7224	Newmarket Investments plc
4408	Rothmans International plc	6041	Vp plc	7245	BT Group
4414	ROUTLEDGE & K PAUL	6046	Sainsbury(J) plc	7258	Alexandra plc
4457	Budgens plc	6058	Kwik-Fit Holdings plc	7269	Osborne & Little plc
4494	SAMUELSON GROUP PLC	6064	BROWNLEE PLC	7270	Sims Food Group plc
4502	SANDHURST MARKET.	6075	PREEDY (ALFRED) & SONS	7331	Salvesen (Christian) plc
4519	Scapa Group plc	6085	WIGFALLS PLC	7364	Energy Technique plc
4583	Sears plc	6102	Ugland International Hldgs p	7370	Hidong Estate plc
4631	SELINCOURT LTD.	6104	Black Arrow Group plc	7386	JLI Group plc
4683	Shiloh plc	6201	Airflow Streamlines	7389	Kewill Systems plc
4699	Invensys plc	6202	ALLEBONE & SONS PLC	7415	SPG Media Group plc
4729	Merchant Retail Group plc	6205	ARIEL INDS. LTD.	7421	Ashley (Laura) Holdings
4734	Semara Holdings plc	6223	BI Group plc	7426	Cranswick plc
4752	Doctus plc	6228	Chamberlin & Hill plc	7431	Jacques Vert plc
4858	STANDARD FIREWORKS	6242	WT Foods plc	7437	Mothercare plc
4883	Staveley Inds plc	6244	ELLENROAD MILL	7453	Jarvis Porter Group plc
4886	STEAD & SIMPSON 'A'ORD	6248	WAREHOUSE GROUP PLC	7488	Westbury plc
4897	Alexon Group plc	6262	Harris (Philip) plc	7491	Airsprung Furniture Group
4902	STEPHEN (A.) & SONS	6274	Innovations Group plc	7543	Creightons plc
4911	Sterling Industries plc	6277	Lees(John J) plc	7549	Eve Group plc
4931	Stirling Group plc	6278	Leigh Interests	7580	Blacks Leisure Grp plc
4935	Adam & Harvey Group plc	6282	West Industries plc	7597	InvestinMedia plc
4936	Stoddard International plc	6311	Priest (Benjamin) Grp plc	7618	Nff plc
4963	Drummond Group plc	6334	DELMAR GROUP PLC	7628	Hewetson plc
4970	Stylo plc	6349	Solvera plc	7630	British Airways plc
4976	Astra Holdings plc	6350	WATSON (R.KELVIN)	7631	Prism Leisure Corp plc
4977	Summer Intnl plc	6361	WSL HLDGS PLC	7724	Tandem Group plc
5014	Banner Chemicals plc	6506	MAGNET PLC	7725	Hartstone Group plc
5027	Syltone plc	6515	Dyson Group plc	7739	Hogg Robinson plc
5031	Symonds plc	6517	Grampian Television plc	7746	Shelton (Martin) Group plc
5085	TECALEMIT LTD	6519	Heath(Samuel) & Sons plc	7767	Wilshaw plc
5118	Tesco plc	6522	FIRST CASTLE ELECTRONICS	7768	Alba plc
5121	Tex Holdings	6536	Castings plc	7805	TGI plc
5152	EMI Group plc	6561	Ferranti Intnl plc	7813	Shanks Group plc
5168	Time Products plc	6588	Whitbread plc 'B Ord'	7823	GWR Group plc
5193	Toothill (R W) plc	6593	Dyson (J & J)'ANV'	7831	Total Systems plc
5198	Towles plc	6600	Bulgin plc 'ANV'	7834	VT Group plc
5209	MCD GROUP PLC	6601	Locker(thomas)(Hldgs)'ANV'	7857	Clinton Cards plc
5214	TRANSPARENT PAPER	6607	Parkland Textile 'A'	7875	Acal plc
5238	Triplex Lloyd plc	6609	BISHOPS GROUP PLC 'A'NV	7888	Prowting plc
5260	TUNNEL HOLDINGS 'B'	6612	Liberty plc'NV Ord'	7891	Southnews plc
5277	UKO INTERNATIONAL	6617	COURTS(FURNISHERS)'NVA'PI	8214	Crown Eyeglass plc
5287	HUNTER PLC	6618	Austin Reed Grp plc'A'	8242	John Lusty Group plc
5289	Uniq plc	6636	Young & Co's Brewery 'NV'Ord	8290	Vodafone Group plc
5306	UBM GROUP	6638	STEAD & SIMPSON	8304	Orbis plc
5310	UNITED PARCELS	6641	BRUNNING GROUP'R.VTG'	8323	Dart Group plc
5315	UDS GROUP	6646	EMAP 'A'	8332	Corus Group plc
5316	UEI	6651	STODDARD HOLDINGS 'A'N.V.	8355	Poole Investments plc
5320	UNITED GAS INDS.	6771	Fuller Smith & Turner 'A'	8360	Amberley Group plc
5356	UPTON(E) & SONS 'ANV'	6780	Danka Business Systems plc	8414	Faupel plc
5382	Yale & Valor plc	6783	Rolfe & Nolan plc	8425	Speedy Hire plc
5407	Victoria plc	6794	ACT Group plc	8430	Ensor Holdings plc
5429	WEST'S GROUP INTNL PLC	6799	Bailey (C H) plc'B'	8431	Wensum Co plc
5433	Waddington plc	6828	Turnbull Scott Hldgs plc	8436	UMECO plc
5440	Wagon plc	6832	Merrydown plc	8453	Babcock Intnl Group plc
5448	Walker Greenbank plc	6866	Intelek plc	8497	Mezzanine Group plc
5455	Century Oils	6882	Cable & Wireless plc		
5472	Volex Group	6891	Asprey plc		
5520	WEDGWOOD LIMITED	6902	Feedback plc		
5521	WA HLDGS	6935	Amersham plc		
5527	Wellman plc	6941	Oceonics Group plc		
5542	SEKERS INTERNATIONAL	6949	Druck Holdings plc		
5595	Whitbread plc	6955	Meyer International plc		
5609	WHITELEY(B.S.& W.)	6981	FKI plc		
5619	WHITWORTH ELECTRIC HLDS	7041	Merant plc		

APPENDIX 1.2

NAMES OF DIFFERENT COMPANIES INCLUDED IN SAMPLE (B)

This appendix shows the names and unique codes (G1: as given by LSPD) for 599 different firms included in sample (B). These firms publish their accounts within the fourth quarter of the year (i.e., Oct.- Dec.). This appendix includes three pages.

9	APV plc	858	BROCKS GROUP LTD	2148	GILL & DUFFUS GRP LTD
20	ABERDEEN CONSTRUCTION	861	BROOK ST.BUREAU	2154	Ketson plc
26	ABERTHAW CEMENT PLC	893	BRUNTONS (MUSSELBURGH)	2178	AGA Foodservice Group
36	BRISTOL STREET MOTORS(NC	922	Bullough plc	2250	GREEN'S ECONOMISER
43	ADVANCE SERVICES LTD	927	Bunzl plc	2251	GREENBANK GROUP PLC
106	Bullers plc	937	Corporate Services Group plc	2293	GROUP LOTUS
141	AMALG. METAL CORP.	938	Burmah Castrol plc	2304	GKN plc
143	AMALG.POWER ENGR.	973	Restaurant Group plc	2307	Diageo plc
167	ANCHOR CHEMICAL GROUP	985	Cadbury-Schweppes	2325	HADEN PLC
171	Anglia Televsn 'A' N.V.	1019	Laird Group	2345	Hall Engr(Hldgs)
225	Appleyard Group plc	1020	Campari International	2350	HALL(MATTHEW) PLC
232	Arcolectric Holdings	1025	CAMREX(HOLDINGS)	2377	HANGER INVESTMENTS
260	Ash & Lacy plc	1030	Canning(W) & Co plc	2407	Elementis plc
283	HUNTLEY & PALMER FOODS	1036	Cape plc	2411	HARRISON (T.C.) LTD
284	ASSOCD. BOOK PUBSHRS	1064	DEBRON INVESTMENTS PLC	2429	Hawker Siddeley Grp
297	Assocd.Fisheries	1129	R E A Holdings plc	2438	Hay (Norman) plc
306	Blue Circle Industries	1134	GBE International plc	2444	Headlam Group plc
332	EAGLE TRUST PLC	1154	Charter plc	2459	Helene
334	SEQUA PLC	1189	Church & Co plc	2477	Hepworth
335	AURORA PLC	1227	Clarke (T) plc	2491	Heywood Williams
351	AUTOMOTIVE PRODUCTS	1229	CLARKE(CLEMENT)	2498	Hickson Internatnl plc
364	Ayrshire Metal Products plc	1234	CLAY(R.)LIMITED	2504	Raven Mount plc
365	BBA Group plc	1237	Clayton,Son & Co.	2575	Home Counties Newsps Hdgs
367	BTR plc	1265	COATES BROS PLC	2576	HOME CHARM LTD
370	Astec (BSR) plc	1266	COATS PATON LTD.	2592	HORIZON TRAVEL LTD
373	BABCOCK INTERNATIONAL	1273	Cohen(A) & Co	2599	HOSKINS & HORTON
386	Ben Bailey plc	1278	COLE GROUP PLC	2610	HOVERINGHAM GRP
390	Baird(William) plc	1287	COLLINS (WILLIAM) PLC	2614	HOWARD & WYNDHAM
399	Baldwin plc	1376	CORAH PLC	2649	HUNTING ASSOCD.IND
422	ActionLeisure plc	1397	Costain Group plc	2650	Hunting plc
449	Trust Motor Group	1422	Arriva plc	2661	HYMAN PLC
459	BARROW HEPBURN PLC	1441	Crest Nicholson	2666	Ibstock plc
462	BARTON GROUP PLC	1450	Croda International	2679	IMI plc
472	BANRO INDUSTRIES PLC	1464	CROUCH (DEREK) LTD	2682	IMPERIAL GROUP
473	BATH & PORTLAND GR	1472	CROWTHER(JOHN) GRP PLC	2687	Inchcape plc
491	BEATSON CLARK PLC	1526	Davies & Metcalfe	2735	INVERGORDON DISTILLERIES
520	4imprint Group plc	1527	Davies & Newman Hldgs	2736	INVERESK GROUP
523	BENFORD CONCRETE	1529	Davis Service Group plc	2756	Johnston Group plc
559	BOM HOLDINGS PLC	1546	DE VERE HOTELS	2764	Bidcorp
566	BESTWOOD PLC	1555	Delta plc	2772	JAMESON'S CHOCOLATES
567	BESTOBELL PLC	1581	DESOUTTER BROS.	2791	Jerome Group plc
602	BLACK & EDGINGTON	1598	Mid-States plc	2810	Johnson Service Group
603	Black(A & C)	1601	DRG PLC	2825	Jones & Shipman
608	BLAKMAN & CONRAD	1610	CEPS plc	2961	Kode International
611	Blackwood Hodge	1681	DUFAY BITUMASTIC	2990	Bioquell plc
614	Blagden plc	1694	Dunlop Holdings	2995	Leslie Wise Group plc
623	Blockleys plc	1723	EAST LANCS.PAPER	3003	Laing (John) plc
628	BLUNDELL-PERMOGLAZE	1736	Linton Park plc	3011	Lambert Howarth Group plc
633	Boddington Group plc	1776	EIS Group plc	3014	Lamont Holdings
634	Bodycote International	1812	Fortress Holdings plc	3036	PLANET GROUP PLC
649	Booker plc	1838	EPICURE INDUSTRIES PLC	3038	Caparo Industries
650	Boosey & Hawkes plc	1850	Erith plc	3043	Laporte plc
674	Rexam plc	1861	EUCALYPTUS PULP MILLS	3066	Cookson Group
679	Spirent plc	1863	EUROPEAN FERRIES GRP	3072	Fobel International
697	Andrews Sykes Group plc	1885	EXECUTEX CLOTHES	3074	LEC Refrigeration
698	Brammer plc	1886	Expamet International plc	3097	Lep Group plc
710	Brent International plc	1923	FEB INTERNATIONAL PLC	3113	RAC plc
719	Hemscott plc	1927	Usborne plc	3115	Kalon Group plc
736	Gaming International plc	1950	Finlay (James)	3145	Linread plc
737	Britax International	1951	Finlay Packaging	3154	Trinity Mirror plc
746	BRITISH ALUMINIUM CO.	1961	Fisher (James) & Sons	3155	PENTLAND INDS PLC
750	British & Commonwealth Hldgs	1968	Fisons plc	3185	LONDON BRICK CO LTD
753	British American Tobacco	1984	Cobham plc	3215	LONDON & NORTHERN GRP.
763	British Borneo Oil & Gas	1991	FOGARTY PLC	3258	Ennstone plc
786	BRITISH ENKALON LTD	2017	Foseco plc	3261	Low & Bonar plc
798	Balfour Beatty plc	2028	FOTHERGILL&HARVEY	3285	Lyon & Lyon plc
802	ROVER GROUP	2037	FRANCIS INDUSTRIES	3296	M Y Hldgs plc
809	British Mohair Holdings	2050	FRENCH KIER HLDS	3298	Macallan-Glenlivet plc
817	BP plc	2055	FRIEDLAND DOGGART GRP	3311	MACKAY(H.)& CO.LTD
820	Maxwell Communication Corp	2068	Futura Holdings plc	3316	Infast Group plc
825	Bridon plc	2101	Garton Engineering	3325	MACPHERSON (D) GRP
835	British Syphon plc	2109	Gates (Frank G) plc	3333	Magnolia Group plc
843	BRITISH VENDING INDS	2115	Geers Gross	3355	MALLINSON DENNY
844	British Vita plc	2139	Gestetner Hldgs	3372	Manchester Ship Canal

Appendix 1.2 continued (1 out of 2)

3373	Manders plc	4412	Rotork plc	5505	Watts,Blake,Bearne
3393	McAlpine (Alfred) plc	4418	ROWNTREE PLC	5519	WEBSTERS GROUP LTD
3402	Marley plc	4419	LONDON PARK HOTELS PLC	5524	Weir Group plc
3416	MARSHALLS UNIVERSL	4426	ROYAL WORCESTER	5562	WESTERN MOTOR HLDGS PLC
3423	Martin International Hdgs pl	4438	RUBEROID LTD	5581	WETTERN BROTHERS
3447	Matthews(Bernard)	4440	Rugby Group plc	5617	WHITTINGHAM (W) (HLDGS)
3468	Meggitt plc	4441	Runciman (Walter)	5632	Wilkes(James) plc
3479	M.D.W. HOLDINGS LTD	4447	Russell(Alexander) plc	5634	W W GROUP PLC
3503	Novar plc	4485	Sale Tilney plc	5642	WILJAY PLC
3504	METAL CLOSURES GRP	4501	C D Bramall plc	5659	Wills Group plc
3507	Metalrax Group plc	4515	Savoy Hotel plc'A'	5666	Wilson Connolly Holdings
3521	METTOY CO.LTD.	4526	British Polythene Industries	5672	Wimpey (George) plc
3551	MILFORD DOCKS CO	4529	SCOTTISH AGRIC INDS	5696	Wolstenholme Rink
3556	Miller(Stanley)	4548	Scottish Heritable Trust	5714	WOODHOUSE & RIXSON
3583	MIXCONCRETE(HLDGS)	4573	Scott'S Restaurant	5749	YORK TRAILER HOLDINGS
3590	Molynx Holdings plc	4639	Senior plc	5760	Yule Catto & Co
3601	PEX plc	4659	Sharpe & Fisher plc	5762	ELBAR INDUSTRIAL LTD.
3641	Mount Charlotte Invs plc	4707	SILKOLENE LUBRICANTS	5763	SOLEX (UK) LTD'A' REG
3649	Mowlem plc	4718	Simon Group plc	6005	Westerly plc
3663	Forward Technology	4740	Slingsby(H.C) plc	6006	Management Consulting Group
3669	MYSON GROUP	4747	SMALL(J.C.)&TIDMAS	6018	BIDDLE HLDGS PLC
3700	SUNLIGHT SERVICE GROUP	4754	Smith & Nephew plc	6030	Macfarlane Group plc
3706	NEEDLERS LIMITED	4776	SOLICITORS'LAW SOC	6035	More Group
3709	NEILL(JAMES) HLDGS PLC	4819	SPARROW(G.W.)&SONS	6052	Christies Intnl plc
3711	NEIL & SPENCER HDGS	4820	Spear(J.W.)& Sons	6062	Benlox plc
3743	NEWBOLD & BURTON	4824	Water Hall Group plc	6082	SUPRA GROUP LTD
3744	NEWARTHILL PLC	4825	SPENCER(GEORGE)LTD	6083	Taveners plc
3751	AVDEL PLC	4836	Spirax-Sarco Engineering	6106	Boot(Henry) & Sons plc
3753	Newman Tonks Group plc	4837	Coats plc	6114	Allied Partnership Group
3769	DCS Group plc	4852	Stag Furniture	6200	Holt (Joseph) plc
3773	Healthcare Holdings plc	4871	STANLEY (A G) HLDGS	6204	CHE Hotel Group plc
3777	NORFOLK CAPITAL GRP	4895	Steetley plc	6220	Delaney Group plc
3802	NORTH (M.F.) LTD.	4943	STONE-PLATT INDS.	6235	Craig & Rose
3828	NOTTINGHAM MANUFG.	5015	Suter Electrical	6250	Aggregate Industries plc
3832	Nurdin & Peacock plc	5035	Boustead	6254	Fife Group plc
3843	Exel plc	5056	Tarmac plc	6260	Gibbs & Dandy 'Anv'
3855	OFREX GROUP PLC	5077	Taylor Woodrow plc	6267	High Gosforth Park Co
3868	Oliver Group plc	5082	BARDSEY PLC	6272	FALCON INDUSTRIES PLC
3985	PEARSON LONGMAN	5100	TELEPHONE RENTALS	6280	Lilleshal plc
3986	Pearson plc	5116	TERN GROUP PLC	6296	Nichols plc
4002	Peninsular & Oriental 'Dfd'	5131	Era Group plc	6297	North Midland Construction
4007	Pentos plc	5132	TSL GROUP PLC	6312	RATCLIFF'S (GT BRIDGE)
4021	Nationwide Accident Repair	5146	THOMSON T-LINE PLC	6318	SMG plc
4029	Beverley Group plc	5162	Interserve plc	6323	BENSON GROUP PLC'25P'
4049	Arley Holdings plc	5164	TILLING(T.)LIMITED	6327	Morgan Sindall plc
4069	Pittards plc	5186	TOMATIN DISTILLERS	6332	SOUND DIFFUSION
4077	Henlys Group plc	5207	TOZER KEMSLEY&MILLBOURN	6341	Thurgar Bardex
4078	PLEASURAMA LIMITED	5216	TDG plc	6342	Donelon Tyson plc
4085	Polly Peck Intnl plc	5223	TRAVIS & ARNOLD	6357	Chubb plc
4087	Polymark Intnl plc	5233	TRICENTROL LTD	6360	WPP Group plc
4096	Portals Group plc	5235	TRIEFUS & CO.LTD.	6362	Wood(Arthur)& Son(Longport)
4098	Porter Chadburn	5248	Forte plc	6390	Univak plc
4114	PRATT(F)ENGR.CORPN	5255	TI Group plc	6504	Lawrence (Walter)
4118	Premier Oil plc	5268	Turriff Corporation plc	6508	BOOTHAM ENGINEERS LTD
4122	PRESS (WM)GRP PLC	5276	TT Electronics plc	6511	CARTWRIGHT (R) HLDGS PLC
4124	PRESTIGE GROUP LTD	5284	Ultramar Co plc	6521	Flare Group plc
4145	PRINCE OF WALES HOTEL CO	5290	Unilever plc	6523	Pavilion Leisure plc
4148	PRITCHARD SERVICES GROUI	5301	United Biscuits	6526	Davenport Knitwear
4193	Queens Moat Houses plc	5322	Harrison Industries plc	6528	Lasmo plc
4196	Quicks Group plc	5331	United Business Media plc	6530	Molins plc
4238	Rank Group plc	5350	UNICORN INDUSTRIES	6555	Eurotherm plc
4243	Ransomes plc	5352	Abbot Group plc	6577	Laing (John)'A' plc
4256	RMC Group plc	5360	Usher-Walker plc	6581	COATES BROS&CO 'A'
4259	Reckitt Benckiser plc	5377	Automated Security	6605	Clifford Foods plc'A'N V
4277	Reed Executive plc	5405	Vickers plc	6614	SHARPE(W.N)HLGS 'A'N V
4279	Whatman plc	5415	The Vitec Group	6623	Oliver Group plc'ANV'
4294	Relyon Group plc	5417	VINERS LTD	6624	Ulster Television plc
4300	Rentokil Initial plc	5424	VOSPER LTD.	6634	Cohen(A)& Co 'A'
4326	RICHARDS&WALL.INDS	5431	Wace Group plc	6640	Barr & W Arnold 'A'N.V.
4345	Rio Tinto	5437	WADKIN LTD.	6733	Life Sciences Intnl plc
4358	ROBERTS,ADLARD& CO	5452	Springwood plc	6746	Conder Group plc
4370	Robinson(Thomas)Group	5470	Ward Holdings	6765	Cluff Resources plc
4373	Rockware Group plc	5474	WARD WHITE GROUP	6766	Clyde Petroleum plc
4404	ROTAFLEX PLC	5504	Alldays plc	6772	Goal Petroleum plc

Appendix 1.2 continued (2 out of 2)

6777	McLaughlin & Harvey plc
6792	BAE Systems plc
6798	Arcolectric Hdgs'A N V'
6803	Cakebread Robey plc
6809	FEB INTERNATIONAL PLC'A'
6811	Gibbs & Dandy
6822	MARSHALL(T)(LOXLEY)
6840	Metal Bulletin plc
6847	Base Group plc
6857	Graseby plc
6867	ROK Property Solutions
6870	Hartons Grp plc
6893	Edinburgh Oil & Gas plc
6897	Creative Recruitment Sltns
6917	Cussins Property Grp plc
6930	First Choice Holidays plc
6934	Peek plc
6944	Wembley plc
6963	Antofagasta plc
6964	M P Evans Group
6980	AMEC plc
6983	Fitch plc
6985	KEAN & SCOTT HLDGS PLC
7004	Microgen plc
7009	Aegis Group plc
7011	Assocd British Ports Hdgs
7030	Spring Ram Corp plc
7056	Sunleigh plc
7093	Zetex plc
7094	Acorn Group plc
7097	Laser-Scan Holdings plc
7151	Anglo Pacific Group plc
7164	Havelock Europa plc
7169	Ramco Energy plc
7171	Greggs plc
7175	Pegasus Group plc
7177	Ultima Networks plc
7178	Stat-Plus Group plc
7196	Reuters Group plc
7198	Enterprise Oil plc
7213	Fastrack Group plc
7214	TDS Circuits plc
7220	PGI Group plc
7221	First Call Group plc
7223	Alphameric plc
7230	Big Food Group
7238	Princedale Group plc
7239	Hawtal Whiting Hldgs
7241	Plasmec plc
7244	T & S Stores plc
7251	INSTEM plc
7253	Monument Oil & Gas plc
7266	Hillsdown Holdings plc
7267	Bluebird Toys plc
7280	Persimmon plc
7289	Anglo-Eastern Plantations
7291	Aspen Group plc
7295	Huntleigh Technology plc
7304	Domino Printing Sciences plc
7310	Perkins Foods plc
7311	Sherwood International
7319	Heavitree Brewery plc
7323	Brent Walker Group plc
7360	RTZ CORP PLC 'ACCUM'
7374	Sema plc
7395	Security & General Media
7400	Metsec plc
7402	Radius plc
7420	Abbott Mead Vickers
7424	Taylor Nelson Sofres plc
7440	IBC Group plc
7445	Wickes plc
7451	BPP Holdings plc
7466	BNB Recruitment Solutions

7473	Sherwood Group plc
7499	Clarkson plc
7501	Densitron Technologies plc
7502	Belgravium Technologies
7503	Evans Halshaw Hdgs plc
7506	Lopex plc
7509	Mark Kingsley
7516	Tarsus Group plc
7537	Tibbett & Britten Group plc
7552	Travis Perkins
7563	Meristem plc
7568	Radamec Group plc
7572	Asite plc
7579	Bilston & Battersea Enamels
7582	Brake Brothers plc
7584	Daniels(S) plc
7595	BG Group plc
7601	Geest plc
7615	Mayborn Group plc
7638	Admiral plc
7646	Mallett plc
7651	Wilson Bowden plc
7655	Huntingdon Life Sciences Gp
7660	Brooks Service Group plc
7663	Calderburn plc
7666	Epwin Group plc
7675	BLP Group plc
7686	Select Appointmnts Hldgs
7691	Wyevale Garden Cnts plc
7695	Rolls Royce Group plc
7705	Crestacare plc
7734	RPS Group plc
7737	BAA plc
7747	WSP Group plc
7759	ISA International plc
7765	SkyePharma plc
7789	Nestor Healthcare Group
7793	Peterhouse Group plc
7826	Psion plc
7836	Intercare Group plc
7837	MTL Instruments Group plc
7848	Holders Technology plc
7853	QA plc
7860	Johnston Press plc
7868	Serco Group plc
7874	ASW Holdings plc
7887	Porvair plc
7890	Jackson Group plc
7904	Christie Group plc
7911	Hi-Tec Sports plc
7919	Severfield-Rowen plc
8000	Mersey Docks & Harbour Co
8239	Parity Group plc
8241	Medeva plc
8262	Tullow Oil plc
8274	Caldwell Investments plc
8279	Prime People plc
8287	Chieftain Group plc
8298	Swallowfield plc
8309	Darby Group plc
8311	Spectris plc
8313	Portmeirion Group plc
8319	Bostrom plc
8320	Cairn Energy plc
8329	Dawsongroup plc
8346	H R Owen plc
8347	Ronson plc
8371	Willisham Group plc
8391	Capita Group plc
8404	SIG plc
8424	Gowrings plc
8449	Entertainment Rights plc
8464	Brandon Hire plc
8466	Fortune Oil plc

8470	Partridge Fine Arts plc
8483	Tempus Group plc
8489	Pendragon plc
8491	Maclellan Group plc
8558	Torday & Carlisle plc
8611	Alliance Unichem plc
8788	AstraZeneca plc

APPENDIX 1.3

NAMES OF DIFFERENT COMPANIES THAT SHOULD BE (INCLUDED/EXCLUDED) FROM SAMPLE (A) TO CREATE SAMPLE (C).

This appendix clarifies method for creating sample (C). It contains two main panels. Panel (A) shows the names and unique codes (G1) for 172 different firms that publish their accounts within the second quarter of the year (i.e., Apr.- Jun.). Panel (B) shows the *names and unique codes (G1) for 11 different firms that while included in sample (A) can not join sample (C) as they do not have* return records by the time returns are observed for this sample (i.e., January of the next year). Consequently, sample (C= 596 firms) is obtained by including the 172 firms in panel (A) and excluding the 11 firms in panel (B) from the firms shown in appendix 1.1, i.e., sample (A).

Panel (A): 179 firms publishing their accounts within the second quarter of the year.

2	A B Electronic Prods Grp
8	AGB RESEARCH
44	Adwest Automotive
244	Armour Group plc
248	ARMSTRONG EQUIPMNT
292	Asda Group plc
315	AT Trust plc
329	ANVIL PETROLEUM PLC
331	NXT plc
486	Beales Hunter plc
501	Beckman(A) plc
612	BLACKWOOD,MORTON
665	Reece plc
769	BRITISH CAR AUCTION
862	BROOKE BOND GRP
896	Bryant Group plc
924	Bulmer(H P) Hldgs plc
1035	Cantors 'ANV'
1045	CAPSEALS LTD
1076	Casket plc
1137	CHAMBERS & FARGUS
1182	Christy Hunt plc
1183	CHRISTIE-TYLER LTD
1225	Matthew Clark plc
1310	Norex plc
1367	Cooper (Frederick) plc
1409	Rubicon Group plc
1436	Anite Group
1496	Dale Electric Intl
1497	Sygen International plc
1620	DSG International plc
1659	Dowding & Mills
1680	DUCTILE STEELS LTD
1770	Elbief plc
1772	Eleco plc
1791	Ellis & Everard
1896	F.M.C.LIMITED
1971	FITCH LOVELL PLC
2088	Galliford Try plc
2162	Gleeson (M J) Group
2179	Noble Raredon plc
2257	Greene King plc
2265	Barratt Developments
2353	HALLITE HOLDINGS LD.
2357	James Halstead plc
2473	Sheffield United plc
2484	Herrburger Brooks
2510	HIGHLAND ELECTR GRP
2524	HILLARDS LIMITED
2617	Howard Holdings plc
2624	Howden Group & Co
2646	HUNT & MOSCROP
2704	INGALL INDUSTRIES
2707	COXMORE PLC
2788	METAMEC JENTIQUE PLC
2837	Jourdan plc
2856	Kalamazoo Computer Group plc
3065	Lawtex plc
3102	LETRASET LTD
3144	GATEWAY CORP PLC
3171	LOCKWOODS FOODS
3282	Lyles (S) plc
3290	MFI FURNITURE GROUP
3301	Macarthy
3457	MAYNARDS LTD.
3466	MEDMINSTER
3568	MS International plc
3577	MITCHELL COTTS PLC
3662	Northgate plc
3758	News International plc 'SD'
3968	PZ Cussons
4027	PETERS STORES PLC
4050	Photo-Me International
4060	Pifco Holdings plc
4128	PRESTWICH HLDGS
4218	Raine plc
4228	Ramar Textiles plc
4246	RATCLIFFE INDUSTRIES
4325	Ricardo plc
4522	Scholes Group plc
4547	SEET plc
4561	Scottish & Newcastle
4661	SHAW CARPET LTD.
4730	Sirdar plc
4751	Smith (DS) plc
4848	STAFFS.POTTERIES
4925	STEWART PLASTICS
4949	STOTHERT & PITT
4962	Strong & Fisher (Hldgs) plc
5124	TEXTURED JERSEY
5187	Tomkins plc
5298	Unitech plc
5409	VICTOR PRODS(WALL)
5430	W RIBBONS HLDGS.
5704	WOOD HALL TRUST
5743	YARROW & CO.LTD.
5790	COPE ALLMAN INTL
6001	WEW Group plc
6043	Beazer plc
6051	Banks (Sidney C)
6061	BEJAM GROUP
6206	Armitage Brothers plc
6211	B.P.M. HLDGS. 'A'
6222	Europower plc
6234	Cradley Group Hldgs plc
6251	Arabis plc
6259	GAUNT (ROWLAND) PLC
6261	Goodwin plc
6283	LDH GROUP PLC
6302	Cadoro plc
6306	PEARCE (C.H.) & SONS
6309	Pochin's plc
6310	Burnden Leisure plc
6321	SHARPE CHARLES & CO
6331	SOMMERVILLE (WLM) & SON
6340	Thorpe (F.W.)
6344	BLUEBIRD CONFECTIONERY
6345	LANDLEISURE PLC
6346	Walker (Thomas)
6396	NOLTON LTD
6513	Copson (F) plc
6582	Smith(W H)Group plc'B'
6585	PZ Cussons 'ANV'
6615	Pifco Holdings plc'A'
6744	Haynes Publishing plc
6752	Amstrad plc
6769	RMS Communications plc
6805	Harveys Furnishing plc
6848	M R Group plc
6936	AIM Group plc
6976	Intereurope Technlgy Svs plc
6996	Bespak plc
7013	Sinclair(William) plc
7054	Renishaw plc
7059	Gent (S R) plc
7061	Maunders(John) Grp plc
7099	Tottenham Hotspur plc
7100	LogicaCMG plc
7109	Tay Homes plc
7140	Quadnetics Group
7189	Northamber plc
7205	Berkeley Group Holdings plc
7324	First Technology plc
7336	Goodhead Print Group
7337	Isotron plc
7342	Polypipe plc
7441	Macro 4 plc
7452	GGT Group plc
7475	White Young Green
7476	Haggas(John) plc
7487	Avingtrans plc
7492	Alumasc Group plc
7534	Stanley Leisure plc
7577	Rage plc
7612	Border Television plc
7653	Misys plc
7657	Reliance Security Group plc
7668	Business Control Solutions
7722	Cook(D C) Holdings plc
7788	Allied Leisure plc
7867	Thorntons plc
7872	Waterman Group
7907	Colefax Group plc
7912	Lincat Group plc
8293	SWP Group plc
8317	Amstrad plc
8338	Cassidy Brothers plc
8429	Trace Group plc
8462	Birse Group plc
8471	Vardy(Reg) plc
8476	Hays plc
9228	News Communications & Media

Panel (B): 11 firms while in sample (A) should be excluded from sample (C).

1567	DENNIS(JAMES H) PLC
1789	ELLIOTT GRP PETERBOROUGH
1938	FIDELITY PLC
2096	GARFORD-LILLEY INDS
4024	PETBOW HLDGS LTD
6244	ELLENROAD MILL
7155	Scantronic Hldgs plc
7386	JLI Group plc
7628	Hewetson plc
7631	Prism Leisure Corp plc
7891	Southnews plc

APPENDIX 1.4

NAMES OF DIFFERENT COMPANIES THAT SHOULD BE ADDED TO FIRMS IN SAMPLE (B) TO CREATE SAMPLE (D).

This appendix clarifies method for creating sample (D). It shows the names and unique codes (G1) for 189 different firms that publish their accounts within the third quarter of the year (i.e., Jul.- Sep.). Consequently, sample (D= 788 firms) is obtained by including the 189 firms in this appendix to the firms shown in appendix 1.2, i.e., sample (B).

13	AARONSON BROS PLC	2903	Group 4 Securicor plc	6807	Dewhurst plc
14	Loades plc	2987	Kwik Save Group	6824	Cornwell Parker plc
67	Albion plc	3004	LAKE & ELLIOT LTD.	6868	Carlton Communications plc
118	Allied Textile Companies plc	3077	Lee(A) & Sons plc	6927	Eldridge Pope & Co plc
237	ARENSON GROUP PLC	3132	LINCROFT KILGOUR GRP PLC	6960	McCarthy & Stone plc
286	Associated British Foods	3250	Lonmin	6984	Quebecor Printing (UK) ltd
295	AE PLC	3252	LONSDALE UNIVERSAL	7042	Ferraris Group plc
298	Securicor Grp	3259	Montpellier Group	7052	M M T Computing plc
304	API Group plc	3270	LucasVarity plc	7057	Tunstall Group
330	Attwoods plc	3303	MCCORQUODALE PLC	7135	LPA Group plc
359	Avon Rubber plc	3313	McKechnie plc	7139	Scottish Radio Hldgs plc
380	Baggeridge Brick plc	3361	Chrysalis Group	7243	UDO Holdings plc
463	BARTON TRANSPORT 'DFD'	3376	Manganese Bronze	7247	Wardle Storeys plc
465	InterContinental Hotels Gp	3430	MARTIN NEWSAGENTS	7281	Prestwick Hldgs plc
547	Enodis plc	3433	MARTONAIR INTL.	7309	Huntsworth plc
576	Bibby(J)& Sons plc	3618	Morland plc	7385	Electronic Data Processing
592	BIRMID QUALCAST	3634	MOSS ENGINEERING	7398	Fairbriar plc
626	BLUEMEL BROS PLC	3653	MUIRHEAD LTD.	7403	St Ives plc
721	Bridport plc	3684	Grovewood Securities plc	7404	Internatl Public Relations
814	BOC Group	3793	NORTH BRITISH STEEL GRP	7457	Sportech plc
834	BRITISH SUGAR PLC	3874	CPS COMPUTER GRP PLC	7496	Blick plc
857	BROCKHOUSE PLC	4053	PICCADILLY THEATRE	7514	Care UK plc
863	Brooke Industrial Holdings	4075	PLASTICS CONSTR.	7542	Pura plc
886	BROWN (MATTHEW)PLC	4181	PYKE(HOLDINGS)LTD	7634	GCap Media plc
930	Hunters Leisure plc	4239	Ranks Hovis Macdougall	7639	MyTravel Group plc
933	BURGESS GROUP PLC	4240	PILGRIM HOUSE GROUP PLC	7648	RCO Holdings plc
946	Arcadia Group plc	4260	RECORD RIDGEWAY	7649	Maisha plc
1018	CAMFORD ENGINEERING	4263	REDFEARN PLC	7735	IRevolution Group
1046	CARAVANS INTL PLC	4459	SGB GROUP LTD	7810	Titon Holdings plc
1065	CARR(J)(DONCASTER)	4696	Sidlaw Group plc	7842	Aukett Group plc
1068	Carrs Milling Industries plc	4721	Daks Simpson Group	7871	Shani Group plc
1091	CAUSTON SIR JOSEPH	4763	Smiths Group plc	7881	Eurocopy plc
1256	Clyde Blowers	4829	SPENCER CLARK METAL INDS	7899	Shaw(Arthur) & Co plc
1319	Concentric plc	4854	Stakis plc	7935	Kunick plc
1395	Cosalt	5037	Talbex Group plc	8230	Seacon Holdings plc
1404	Countryside Props	5061	Tate & Lyle plc	8238	Independent Media Distribn
1452	Cronite Group	5127	Eclipse Blinds plc	8248	Innovata plc
1475	CRYSTALATE(HLDGS.)	5188	Tomkinsons plc	8253	VTR plc
1523	DAVENPORTS BREWERY	5215	Tace plc	8426	Treatt plc
1586	Devenish(J A) plc	5338	Alvis plc	8485	Wescol Group plc
1611	Diploma plc	5341	United Industries plc	8487	Air Partner plc
1623	Dobson Park Inds	5347	UNITED WIRE GROUP	8520	Sage Group plc
1676	DUBILIER INTERNATIONAL	5388	Swallow Group plc	8540	Euromoney Institutional Inv
1798	ELSON & ROBBINS	5434	WADE POTTERIES LTD	8604	Faber Prest plc
1825	English China Clays plc	5473	WARD(T.W.)LIMITED	8626	Greenwich Resources plc
1879	Evode Group plc	5567	Westland Group plc		
1930	Fenner plc	5591	Whessoe plc		
1934	Ferry Pickering Grp Ltd	5650	Williams(John) Industries pl		
1982	Flexello Castors & Whls	5694	Wolseley plc		
2049	French plc	5698	Wolverhampton & Dudley		
2159	GLASS GLOVER GR.	6028	Lookers plc		
2194	GOMME HOLDINGS LTD	6029	Low(Wm) & Co plc		
2222	ITV plc	6063	Bett plc		
2227	Grand Metropolitan	6076	Pressac plc		
2255	De Vere Group plc	6084	WALKER & HOMER		
2320	H T V Group plc	6109	Chemring Group plc		
2381	Hanson plc	6216	FCX International		
2389	Hardys & Hansons plc	6225	Burndene Investments plc		
2470	HENLYS LTD.	6233	Cordiant Communications Gp		
2509	Highland Distillers plc	6240	Dickie(James) plc		
2514	HIGSONS BREWERY	6255	Albert Fisher Group		
2516	McLeod Russel Hldgs plc	6299	NOTTINGHAM BRICK PLC		
2520	Hill & Smith Hldgs plc	6343	TYZACK PLC		
2579	HOMFRAY & CO LTD	6355	Wheway plc		
2642	HUNSLET(HLDGS)LTD.	6514	African Lakes Corp plc		
2721	ICL LTD	6518	Widney plc		
2759	JACKSON(J.& H.B.)	6544	LWT (Holdings) plc		
2795	Jessups (Hldgs) plc	6579	Daily Mail & General Tr 'A'		
2815	Firth Rixson plc	6606	Greenalls Group plc'A'		
2850	K SHOES LIMITED	6667	Bellway plc		
2893	Kelsey Industries	6728	Fairline Boats		
2902	KENNING MOTOR GR	6782	Pict Petroleum plc		

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