The Timing And Performance Of Initial Public Offerings : Insights From Securitized Real Estate New Issues

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

AIM	Alternate Investment Market
ALPT	Australian Listed Property Trusts
APT	Arbitrage Pricing Theory
APV	Adjusted Present Value
CAR	Cumulative Adjusted Return
CAPM	Capital Asset Pricing Model
CSO	Central Statistical Office
DCF	Discounted Cash Flow
DNAV	Discount to Net Asset Value
EBIT	Earnings Before Interest and Taxes
FSA	Financial Services Act 1986
FTA	Financial Times Actuaries All Share Index
FTA Prop	Financial Times Actuaries Property Index
GNP	Gross National Product
HGSC	Hoare Govette Small Company Index
IPD	Investment Property Databank
IPO	Initial Public Offerings
JLW	Jones Lang Wootten
MLPs	Master Limited Partnerships
NAV	Net Asset Value
NPV	Net Present Value
NYSE	New York Stock Exchange
OLS	Ordinary Least Squares
PIPO	Property Investment and Property Development IPOs
P/E	Price Earnings Ratio
PRT	Property Investment and Property Development rights issues
REIT	Real Estate Investment Trusts
RICS	Royal Institution of Chartered Surveyors
RT	Rights Issue
SIB	Securities and Investment Board
SDNAV	Sector average Discount to Net Asset Value
SEO	Seasoned Equity Offering
SAVP	Statements on Asset Valuation Practices
UK	United Kingdom
US	United States of America
USM	Unlisted Securities Market
WACC	Weighted Average Cost of Capital
YB	London Stock Exchange Yellow Book

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DECLARATION

This thesis may be made available by the University Librarian to allow single copies to be made for study purposes.

ABSTRACT

The thesis broadly attempts to address two issues. First, does the special pricing of securitised real estate firms provide insight into the initial returns, long-run performance and timing of IPOs? Second, is inter-temporal variation in IPO activity the result of windows of opportunity that depend on business conditions?

Securitised real estate IPOs are useful in understanding IPO behaviour because of the unique asset value methodology used for pricing their shares. Empirical evidence in the thesis confirms that Property Investment IPOs have more certain prices and lower initial returns than Property Development IPOs. Property Investment IPOs are found to be efficiently priced in the secondary market. These results are supportive of underpricing-efficient markets explanations of initial returns. In contrast to findings for operating firms, Property Investment company equity issuers do not underperform non-issuers. The results for Property Investment and Property Development equity issuers are consistent with pricing uncertainty and cognitive bias adversely affecting aftermarket performance. The similar long-run performance of IPOs and rights issues documented in the thesis rejects the contention that firms time issues to take advantage of new shareholders. Regression analysis of property stocks confirms that neither book-market nor size characteristics are associated with new issue effects in the UK property share market. There appears to be a real estate pricing characteristic that affects both the initial and long-run performance of securitised real estate IPOs.

The thesis proposes the windows of opportunity theory to explain variations in issue activity. Firms go public when improved business conditions result in better business opportunities, weaker adverse selection costs, and lower direct issue costs. The sample of 1261 firms used to test the theory provides considerable empirical evidence of the characteristics of the UK IPO market. Using duration (the spell between IPO transactions) for the first time in the IPO literature, a positive relationship between IPO activity and both business and stockmarket conditions is confirmed. Time series regressions on the real amount raised in IPOs confirms that more money is raised when the business conditions are near a peak and when the stockmarket is relatively

high. Poisson regression results suggest that IPO volume is linked to business conditions. Property Investment and Property Development IPO activity is found to increase following an increase in real estate market conditions; suggesting that variations in industry business conditions explain variations in industry IPO activity. Firms that went public in hot issue markets achieve cost savings over cold issue market firms. Firms undertaking IPOs in hot issue markets typically pay only 65% of the costs incurred by cold market issuers. Hot issue market IPOs on average have implied costs from initial returns which are 60% less than cold issue market IPOs. Time series regression results indicate that high initial returns deter firms from going public and increased information flow attracts firms to the market. The results suggest that business opportunities, adverse selection costs and direct issue costs determine IPO activity.

CHAPTER 1

Introduction

1 OBJECTIVES OF THE THESIS

Start up companies typically raise equity from a few private investors. As a company progresses through it's life-cycle it will require more capital and at some point it will find an initial public offering [hereinafter IPO] beneficial. An IPO is the first public equity offering made by the firm. An IPO includes two major financial and strategic decisions for the firm; a decision to become a corporation listed on a public stock exchange and a decision to raise equity.

Many firms list on a public stock exchange because original investors want to increase the liquidity and diversity of their personal portfolios.[1] Another important reason to go public is to overcome the borrowing constraints set by banks and increase borrowing power with banks. The added reporting and disclosure requirements of a public listing places constraints on managerial activities, which can benefit firms by decreasing agency problems between shareholders and managers. Listing on a public exchange also increases the number of investors that know of a company, which can lead to reductions in the firm's cost of capital.

There are also costs to becoming a listed corporation. A team of advisers navigates the firm through the marketing of the issue and the regulations of the local stock exchange. Consequently, the direct cost of an IPO is typically far greater than the cost of other financing arrangements. There are also significant indirect costs of going public. These are the management time involved in the process and the implied cost of selling shares at a price that is on average lower than the price established in the

1 For a review of the benefits and costs of going public see Pagano, Panetta and Zingales (1995).

aftermarket. There may also be significant corporate information control disadvantages to being listed.

As IPOs involve the sale of shares from privately held firms via investment banks to a mixture of institutional and retail investors there are numerous opportunities for information asymmetries and agency conflicts to affect IPO markets. These features and the importance of the IPO in the life-cycle of a firm, have attracted many theoretical and empirical researchers to the IPO literature.

Previous studies have shown that IPOs are associated with dramatic performance effects not found around other firm events. The two most prominent anomalies identified by previous researchers are positive average returns on the first day an IPO trades and significant long-run underperformance. There are also other empirical regularities such as the appearance of periods of extraordinarily high initial returns and high issue activity. These characteristics of IPO behaviour do not have explanations fitting easily within the market efficiency paradigm.

Rational explanations for IPO behaviour have focused on the existence of information imperfections such as; adverse selection costs, pricing uncertainty and market segmentation. The persistence and international nature of the IPO anomalies have also drawn irrational explanations. The existing theories have provided insight into IPO behaviour but leave several questions unanswered.

This thesis attempts to explain part of the anomalous behaviour of IPOs. The theme of the thesis is to use the special characteristics of securitised real estate IPOs to gain insight into the IPO anomalies. Although securitized real estate IPO research is relatively immature, securitized real estate firms have successfully been used in the corporate finance literature to understand firm decisions. Securitised real estate IPOs are useful in understanding IPO behaviour because of the unique asset value methodology used for pricing their shares. As the offer prices of UK Property Investment IPOs are based on the value of a real estate portfolio, these IPOs have greater pricing certainty than UK operating company IPOs in general, and UK

Property Development IPOs in particular. The thesis aims to determine whether the special pricing characteristics of securitised real estate IPOs can give insight into the behaviour of IPOs.

The first objective of the thesis: is to explain parts of the anomalous first day performance of IPOs. The initial performance literature is overwhelmed with evidence of positive first day returns for operating firms, but securitised real estate IPOs are found to have near-zero initial price reactions. Attention has focused on the pricing certainty of securitised real estate firms to explain the low initial returns. Using a sample of Property Investment and Property Development IPOs the thesis first aims to determine whether there is a real estate pricing characteristic affecting the initial performance of securitised real estate IPOs. Second, despite the importance of the pre-market valuation to the interpretation of initial returns there has been little direct evidence comparing the valuations of IPOs and seasoned firms around the listing date. Using the special pricing characteristics of Property Investment IPOs the thesis aims to directly test whether IPOs are over or undervalued during varying market conditions.

The second objective of the thesis: is to reveal firm characteristics underlying the long-run performance anomaly. The recent cognitive bias explanation of long-run underperformance relies on investors overvaluing IPOs at the issue and subsequently realising lower returns than if they had taken a similar position in non-equity issuing firms. If cognitive bias is the cause of the new issue effect we would expect firms with low pricing uncertainty to present fewer opportunities for overvaluation and perform better in the long-run. The thesis aims to determine whether low-pricing-uncertainty Property Investment IPOs perform relatively better in the aftermarket than high-pricing-uncertainty Property Development IPOs.

The third objective of the thesis: is to explain inter-temporal variation in IPO activity. The thesis provides an explanation for hot issue markets based on windows of opportunity caused by adverse selection costs, direct issue costs and business conditions. The hypothesis of this thesis is that an improvement in business

conditions results in more business opportunities for firms, lower adverse selection costs, and lower direct issue costs. Therefore it is predicted that IPOs cluster in windows of opportunity found near peaks in business conditions. Several of the empirical implications of the theory are tested in the thesis.

2 OVERVIEW AND STRUCTURE OF THE THESIS

The thesis contains ten chapters. Following this introduction Chapters 2 and 3 examine previous IPO research. Chapter 4 describes the institutional environment of the UK IPO market. The next three chapters use Property Investment and Property Development IPOs to gain insight into IPO performance. Chapter 8 presents and tests the windows of opportunity theory. Chapter 9 uses Property Investment and Property Development IPOs to test the windows of opportunity theory. Chapter 10 concludes the thesis.

Chapter 2 reviews evidence from IPO markets around the world indicating anomalous characteristics associated with IPOs. The interpretation of the empirical results from a perspective of market efficiency and the implications for investors are discussed. Chapter 2 identifies key empirical findings that are the subject of later chapters. In contrast to the evidence surrounding operational IPOs, investors should not expect such high positive initial returns from Real Estate Investment Trust IPOs. Uncertainty surrounding the intrinsic value of the IPO is consistently found to be a positive influence on initial returns. Underperformance is concentrated in a few firm types which are also associated with pricing uncertainty. Despite the insightful findings securitised real estate firms provide for the initial return literature they have been excluded from long-run performance studies. The evidence documenting IPO hot issue markets reveals IPO activity is related to stockmarket and business conditions and seasoned equity offering activity.

Chapter 3 evaluates the theoretical literature explaining IPO behaviour. Theories explaining the positive average first day returns of IPOs are evaluated with reference

to direct empirical tests and the behaviour characteristics described in Chapter 2. Underpricing models often predict that pricing uncertainty is the crucial factor in determining the magnitude of initial returns. In contrast to the equilibrium models explaining positive initial returns, rational explanations of hot issue markets and long-run underperformance are difficult to find. This chapter concludes that cognitive bias; the tendency for investors to base expectations on recent operating performance instead of long-run trends; is a possible reason for long-run underperformance. The chapter concludes market imperfections that vary with business conditions is a promising explanation for inter-temporal variation in IPO activity.

Chapter 4 examines the institutional structure of the UK IPO market. As the special characteristics of Property Investment and Development IPOs are used extensively later in the thesis, and they are subject to special rules on the London Stock Exchange, additional emphasis is placed on the regulatory constraints imposed on these IPOs. The literature documenting the direct costs of obtaining a public listing is also reviewed in this chapter. This chapter also presents empirical results of the direct cost of undertaking Property Investment and Development IPOs in the UK.

Chapter 5 introduces securitised real estate firms and establishes the unique pricing characteristics of securitised real estate IPOs in the UK. This chapter describes the adjusted net asset value (adjusted NAV) method of pricing Property Investment IPOs. This chapter agues that the adjusted NAV of a Property Investment IPO is a more accurate estimate of intrinsic value than valuations based on discounted cash flow and comparable firm multiples. This contends argues that the pricing uncertainty of securitised real estate IPOs should be lower than the pricing uncertainty of operating company IPOs on average. In particular this chapter argues that Property Investment IPO offer prices are less uncertain than the offer prices of Property Development IPOs.

Chapter 6 provides empirical evidence on the effect of real estate assets on the first day returns of IPOs. Previous theoretical work predicts that uncertainty surrounding the intrinsic value of an IPO determines the underpricing discount and thus the

magnitude of initial returns. The initial returns of Property Investment and Property Development IPOs provide a test of whether a real estate factor affects the initial returns of securitised real estate IPOs. Descriptive statistics in Chapter 6 test the two hypotheses that Property Investment IPOs have lower pricing uncertainty and lower first day returns than Property Development IPOs. This chapter also attempts to determine whether IPOs are correctly valued in varying market conditions. To determine whether Property Investment IPOs are under or overvalued, the adjusted NAV valuations of Property Investment IPOs are calculated at the offer price and first day closing price.

Chapter 7 compares the post IPO and rights issue adjusted performance of Property Investment companies, to that exhibited by Property Development companies. The analysis of Property Investment IPOs extends the long-run performance literature by determining whether underperformance occurs in securitised real estate markets. The lower pricing uncertainty of Property Investment firms suggests they should be less susceptible to cognitive bias than Property Development firms, and thus perform better on average in the long-run. Furthermore, if Property Investment IPOs are fairly priced at the issue date, and overvaluation at the issue date is the sole root of long-run underperformance, these firms should not underperform.

To test the cognitive bias theory the performance of Property Investment and Property Development equity issuers under various issue date conditions is examined. The earnings patterns of issuing and non-issuing firms are also examined. An examination of the cross-section of property stocks over the period 1984 to 1994 tests whether book-market and size characteristics cause new issue effects in the UK property share market. This analysis appears to be the first non-US examination of the influence firm specific characteristics have on securitised real estate equity returns.

The third contribution this chapter makes is to examine the performance of rights issues and IPOs from firms in the same industry matched by pricing uncertainty. Previous researchers have suggested that rights issues remove the motive for timing equity issues for overvaluation; inferring that rights issue underperformance is not the

result of overvaluation timing. If IPOs and rights issues of Property Development companies have similar long-run performance then deliberate overvaluation timing would not appear necessary to explain either the hot issue markets or long-run underperformance anomalies.

Chapter 8 presents the windows of opportunity theory. In this thesis windows of opportunity are periods of good business conditions when there are lower costs incurred in going public. When asset values are higher the firm reveals less negative information by announcing an equity issue. Issuing in better business conditions also allows firms to issue more equity to take advantage of size economies in issue costs. Several empirical implications of the theory are tested in Chapter 8. It is examined whether the time between IPOs, termed duration, decreases when economic conditions improve. The duration of IPOs is also investigated in intervals relative to peaks and troughs in the business cycle. The implications that firms going public in hot issue markets can achieve savings in direct and implied costs are tested, using duration to determine hot and cold issue markets.

Chapter 9 is a brief econometric examination of the relationship between the number of Property Investment and Development firms going public and real estate market conditions. If the timing of IPOs derives from business conditions then industry business conditions should be able explain the issuance behaviour of specialist industries. This chapter examines whether real estate market conditions positively affect property IPO volume as predicted by the windows of opportunity theory. Because of the nature of volume data an innovative Poisson modelling technique tests this hypothesis.

Finally, Chapter 10 gives a survey of the main findings from the empirical chapters of the thesis and concludes with the contribution this thesis makes to the understanding of IPO behaviour. Future research topics in the area of IPO anomalies are discussed in the concluding comments.

3 LIMITATIONS TO THE STUDY

A number of limitations may be identified in the empirical research of the thesis:

- Wherever possible the empirical investigations have been undertaken with ongoing discussions with practitioners in the City of London. However, there has been no attempt to supplement these informal investigations with interviews or questionnaires,
- This study deals with UK Property Investment companies as active securitized real estate firms. Because of the nature of these companies it is acknowledged that their similarity to securitized real estate firms in other capital markets may vary cross-sectionally and over time,
- Several databases and hard copy sources including archived listing particulars have been used to minimise errors and maximise the size of the sample used in the thesis. However, data unavailability has been a major problem found during this research.

CHAPTER 2

Empirical Evidence Documenting The Behaviour Of IPOs

1 INTRODUCTION

a. The efficient markets hypothesis and the behaviour of IPOs

This chapter examines empirical evidence documenting the behaviour of IPOs. The evidence of previous studies is presented as a series of stylised facts. This approach facilitates an exploration of IPO behaviour from an investor's perspective, and defines those characteristics of IPO behaviour that are the focus of the empirical chapters later in the thesis. The anomalies identified are: (i) positive average first day returns, (ii) long-run underperformance, (iii) intervals of extraordinarily high issue activity (hereinafter hot issue markets), and (iv) intervals of extraordinarily high initial returns (hereinafter hot return markets). Before proceeding, the implications of the efficient markets hypothesis for the interpretation of IPO behaviour require discussion.

One of the dominant ideas in finance is that capital markets are efficient. The term "market efficiency" means that asset prices fully reflect all available information. More sensibly; prices reflect information up to the point where the profits from acting on information do not outweigh the costs of attaining information and trading.[2]

Whether markets are efficient is not the issue focused upon in empirical tests of the hypothesis. Empirical tests aim to determine the degree of efficiency. From the preceding general definition the efficient markets hypothesis has been subdivided into: weak, semi-strong, and strong forms, depending on the type of information which is reflected in prices. Weak form efficiency means that current prices fully

2 Jensen (1978)

reflect information contained in past prices. Semi-strong form efficiency means that current prices reflect all publicly available information (which includes information in past prices). Strong form efficiency means that all information, public or private is encompassed in current prices. There is no conclusive validation for the form of market efficiency, despite a considerable number of empirical studies examining the issue.[3]

The premise of this thesis is the concept of semi-strong form market efficiency. It is conventional and reasonable to assume that prices quickly impound all information which is available to many market participants. It is less reasonable to assume that prices impound firm specific information which is unknown to market participants. Thus the semi-strong form appears the most theoretically attractive form of market efficiency. The assumption that markets are semi-strong form efficient has several implications for the interpretation of evidence documenting the behaviour of IPOs.

In semi-strong efficient markets share prices reflect fundamental value assessable from all public information. Therefore the first trades of shares of an IPO should establish the fundamental value of the issuing firm's shares. A price increase in the early trading of an IPO is therefore interpreted as the firm issuing shares at a price below fundamental value (underpricing). The initial return gained by investors can be considered an indirect cost of issue paid by the issuing firm. Conversely, a price decrease in early trading is interpreted as overpricing; a notional profit to the issuing firm.

In the IPO literature underpricing is often used as a synonym for positive initial returns. However, it is important to recognise that the underpricing terminology relies on the assumption that secondary market prices are not subject to deviations from fundamental value. The occurrence of periods when greater than 50% average initial returns occur questions the underpricing assumption.

3 Early empirical tests of market efficiency in these forms have been reviewed in Fama (1970). Fama (1991) summarises the recent tests of the market efficiency forms under the categories of: (i) tests for return predictability, (ii) event studies, and (ii) tests for private information. See Haugen (1995) for a book length review of the case against efficient markets.

Following the establishment of the fundamental value of an IPO in the stockmarket, newly listed firms should perform as predicted by asset pricing models. The most commonly adopted pricing models: the Capital Asset Pricing Model (CAPM), and the Arbitrage Pricing Theory (APT), do not differentiate between new and seasoned firms. Hence the identification of a firm as being recently listed should not affect long-run performance. If IPO firm returns deviate from expected long-run performance there are two general explanations. First, the model used to establish expected return is incomplete. Second, stockmarkets are inefficient.[4]

The assumption of market efficiency also has implications for the interpretation of inter-temporal variations in IPO activity. In the perfect market of Modigliani and Miller (1958), issuing equity is a zero net present value transaction, and therefore no time is better to issue than any other. The implication from this rationale is that IPOs should occur randomly over time. Holding the number of firms eligible to go public constant over time, and applying Modigliani and Miller's (1958) premise, periods of high IPO activity can be explained by two general theories. First, the existence of imperfections such as information asymmetry and transaction costs result in timing benefits to firms, thus causing variations in IPO activity. Second, investor irrationality causes prices to deviate from fundamental value, resulting in periods when firms can time IPOs to sell overvalued equity to new shareholders.

The four stylised facts: positive average initial returns, long-run underperformance and hot issue and hot return markets, after questioning measurement and statistical results, and allowing for trading costs, still require explanation. Preceding discussion of the underlying reasons for the observed effects, this chapter has the necessary objective of defining the empirical facts.

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4 There is substantial evidence that returns can be predicted by firm characteristics not identified in asset pricing models as risk factors. Recent research, catalysed by Fama and French (1992), suggests that returns are predictable from size and market-book ratios. Fama (1991) points out that evidence of return predictability brings considerable attention to the joint hypothesis problem. Does return predictability reflect irrational deviations of price from fundamental value or rational variation through time of equilibrium returns which are misunderstood by existing asset pricing models? The anomalies could be evidence of market inefficiency but they could also result from incomplete asset pricing models.

The are four empirical issues identified in this chapter which form the topics of later chapters: (i) the importance of pricing uncertainty to IPO initial and long-run performance, (ii) the absence of a securitised real estate long-run performance study, and the commonality of IPO and SEO underperformance, (iii) evidence of hot return markets, (iv) evidence of inter-temporal variations in issue activity.

The remainder of the chapter is organised as follows: Evidence of initial performance is reviewed in section 2. Long-run performance is evaluated in section 3. In section 4 hot issue and hot return market evidence is discussed. Section 5 concludes with a summary of the stylised facts of IPO behaviour.

2 INITIAL PERFORMANCE

a. International evidence of positive initial returns

The most well known IPO anomaly is the price increase of IPO shares on their first trading day. A large international literature has built up documenting that, on average, positive initial returns accrue to IPO investors. Ibbotson, Sindelar and Ritter (1995) have conducted the largest empirical study to date. They analyse a sample of 10,626 US IPOs that listed between 1960 and 1992, and report an average first day return of 15.26%.

Studies using international data are not as numerous as those using US data, but there is a fairly extensive coverage of the world's stock markets. Positive first day returns are consistently reported, although there are some large differences in the magnitude of returns between countries. For example, Levis (1993) reports an average initial return of 14.3% from UK IPOs between 1980 and 1988, while Jenkinson (1990) reports a comparative statistic of 31.9% for Japanese IPOs during part of this period.

Many US and international studies are reviewed in Ibbotson, Sindelar and Ritter (1995) and Ibbotson and Ritter (1992). Table 2.1 reproduces the statistics Ibbotson and Ritter (1992) gather from various studies. The statistics in Table 2.1 are equally weighted average initial returns. Initial returns are calculated as the percentage increase from the offer price, to the price shortly after the stock is floated. Studies using one day time periods usually report raw returns, whilst those with longer periods (up to several weeks) use market adjusted returns. Due to the shortness of the time periods involved, differences in the exact period length and whether returns are market adjusted or not, are not likely to significantly alter the results.[5] Even though the statistics in Table 2.1 are not exactly comparable, it can be concluded that economically significant average initial returns occur internationally. The world average, weighted by sample size, is around 19%.[6]

The evidence of positive average initial returns has attracted explanations from many theoretical researchers. Most theories assume initial returns are the result of underpricing and then formulate a reason why firms should be compelled to sell their first equity issue below fundamental value. The models explaining positive initial returns are examined in Chapter 3.

5 If the average daily return on equities is approximately 0.06% (15% pa divided by 250 trading days) different ways of calculating daily equilibrium returns have little effect on the conclusion that IPOs have abnormally large returns in the initial trading period. For a review of this issue see Miller and Reilly (1987).
6 Comprising an average for the US of 16.4% and the rest of the world at 27%

Table 2.1 International evidence of average initial returns from IPOs

Country	Sample	Time Period	Average Initial Return %
Australia	126	1966-82	26.8
Brazil	62	1979-90	79.0
Canada	100	1971-83	9.3
Finland	82	1984-89	9.6
France	131	1983-86	4.2
Germany	97	1977-87	21.2
Greece[7]	79	1987-91	48.6
Hong Kong	34	1979-82	10.2
Japan	303	1979-80	31.9
Korea	272	1984-90	79.0
Malaysia	34	1979-84	149.3
Mexico	40	1987-90	12.4
Netherlands	46	1982-87	2.1
New Zealand	149	1979-87	28.8
Singapore	66	1973-87	27.0
Sweden	22	1983-85	40.2
Switzerland	42	1983-89	32.8
Taiwan	68	1981-88	30.0
United Kingdom	632	1980-88	14.1
United States	8668	1960-87	16.4

Source : Ibbotson and Ritter (1992)

b. The distribution of initial returns

Several studies report that median returns are substantially less than mean returns, making the distribution of IPO initial returns positively skewed. Ruud (1993) reports that instead of forming a symmetric distribution over a positive mean, the distribution of initial returns from US IPOs, peaks at zero and includes very few observations in the negative tail.[8] Thus in Ruud's (1993) sample there are few firms that experience a negative price reaction on the first days of trading, many zero performers and a few high gainers. For 25% of the IPOs in Ruud's (1993) sample the initial return was zero. Other studies report a similar proportion of IPOs with price decreases. Michaely and Shaw (1994) report that 21.5 % of the 947 firms included in their sample of US IPOs undertaken during the period 1984-1988 had a negative price reaction. In the

7 Kazantzis and Levis (1995)
8 Keloharju (1993) also reports skewness and excess kurtosis for his sample of initial returns from Finnish IPOs.

UK Levis (1993) analyses the first day performance of IPOs during the period 1980 to 1988. From a sample of 712 IPOs he reports that approximately 13% of Placings achieved a negative return on the first day, while 28% of Offers For Sale declined in price.

Evidence of a positively skewed initial return distribution has an important implication for investors. Only investors that remain in the IPO market over time and subscribe to the high return IPOs can be assured of high average positive initial returns.

c. Lower value weighted average initial returns

Several studies have documented that initial returns tend to be greater for small young firms. For example, Ibbotson, Sindelear and Ritter (1995) show that the average initial return from firms with annual sales of less than $1 million is 31.4%. The comparative statistic for IPOs with sales greater than $25 million is only 5.3%. The size effect in initial returns causes equally weighted average returns to usually overstate initial performance from value weighted average returns.

d. The effect of rationing on initial returns

Over-subscription, resulting in various forms of rationing, is an important characteristic of IPO markets. In many contract types the issuer offers a price and awaits a reaction from investors; as a consequence shares do not go to the highest bidder as in an auction. Instead the price is set and excess demand rationed. If rationing was random across IPOs it would mean that for any given investor, the invested amount on which the reported average return was being earned, would be smaller than the desired invested amount. If the issues that are rationed are typically the ones with high first day returns, then actual money returns to investors that attempt to purchase an equal amount of each issue will be substantially lower than equally weighted averages.

Studies using data from outside the US markets suggest that allocation conditional initial returns are lower than equally weighted average initial returns. Levis (1990) investigated allocation conditional average initial returns from 123 Offer For Sale UK IPOs after allowing for notional interest lost by investors during the offer process.[9] He finds that the average initial return falls from 8.64%, to below 3.5%, after adjustment for rationing and notional interest costs.[10] Koh and Walter (1989) report a positive and significant correlation between over-subscription levels and initial returns. From a sample of 66 Singaporean IPOs during the period 1973-1987 they find an equally weighted average initial return of 27%. However, weighting returns by allocations' results in an average return of only 1%. Keloharju (1993) examines 80 Finnish IPOs issued between 1984 and 1989 to determine allocation conditional average returns. He finds that the average initial return is 8.7% whereas the allocation conditional average return ranges from -.3% to 5.1%.[11] Dividing his sample into rationed IPOs (50) and non-rationed IPOs (30), Keloharju (1993) finds that unconditional average initial returns are 18.2% and -6.4% respectfully.[12]

The results of Levis (1990) and others have confirmed that rationing is an important characteristic of IPO markets. Rationing has important implications for investors and theories predicting positive average initial returns. Despite the high equally weighted average initial returns, investors that attempt to purchase an equal amount of each issue do little more than break even. Models that attempt to explain positive average initial returns should incorporate rationing in their basic structure. We will see in Chapter 3 that the model of Rock (1986), which has stimulated the research reviewed

9 In UK Offers For Sale interest charges as well as rationing must be taken into account because subscribers usually forward payment for the full possible amount of their subscription 7 days before trading. Any refund due to the investor not attaining a full allotment will not be available to the investor until 2-3 days after the IPO date. Thus the investor will bear some interest cost, which is exacerbated if rationing is high.

10 No results of allocation conditional returns for Placings are presented by Levis (1990) or any other study. It is possible that since a large proportion of UK issues are by discretionary allocated Placements, investors who are "favoured" by sponsors may get better returns.

11 In the Finnish IPO market there is an allocation bias toward small investors (rather than toward institutions for example) which causes negative average allocation weighted returns for large investors and the opposite for small investors.

12 Direct tests of the extent and impact of rationing on initial returns have not been carried out in the US literature because of difficulty obtaining sensitive rationing data. Beatty and Ritter (1986) report anecdotal evidence which suggests that investors may get less than 5% of requested offerings in many issues. Carter and Manaster (1990) examining 501 US firm commitment IPOs issued between 1979 and 1983 report that 420 of these issues enacted their over-allotment options. This indicates that on average IPOs are over-subscribed.

in this section, is the only model to incorporate rationing as an explanation of underpricing.

e. Trading volume, bid-ask spreads and intra-first day price movements

Several studies have examined the market microstructure of IPOs to determine the returns that subscribing and secondary market investors achieve by selling IPO shares in the aftermarket. The existing evidence suggests that trading on the day of the IPO is, on average, intense and relatively cheap. Miller and Reilly (1987) examine the daily trading volume for a sample of 510 US IPOs during the period 1982-1983. They find the average first day volume was 22.1% of the number of shares issued. Barry and Jennings (1993) also find substantial trading activity on the first day for IPOs. On average they find first day turnover equal to 43% of the value of newly issued stock. This level of trading is far higher than normal secondary market trading. The NYSE Fact Book reports that over the 1975-1985 period an average annual trading volume of 30-40% is usual.

A major component of transaction costs in equity markets is the bid-ask spread. It appears that trading in IPO shares in the initial after-market is significantly cheaper than trading other stocks. Hegde and Miller (1989) compare the bid-ask spreads of 540 US IPOs issued between 1983 and 1984, with a randomly selected control sample of seasoned firms. Hegde and Miller (1989) report that in the early aftermarket the average bid-ask spread for IPOs is 75% of the average for seasoned firms. The significant difference in average spreads last for approximately 3 weeks.

Further results of Hegde and Miller (1989) indicate that IPO bid-ask spreads are lower because of both low levels of determinants of spreads and low sensitivity to these determinants. Dealers increase their IPO spreads by lesser amounts in the event of higher volatility or adverse information risk during the first five weeks. Other results suggest that the trading volume and number of market makers for IPOs are

significantly higher than seasoned firms but these characteristics revert rapidly in the aftermarket.[13]

Recently researchers have examined how the price of an IPO moves during the first day. Barry and Jennings (1993) examine the intra-day price behaviour of 175 industrial and 54 closed end fund IPOs issued between 1988 and 1990. They show that on average 90% of the initial return occurs at the opening transaction. The median open-to-close rate of return in Barry and Jennings (1993) sample is zero. They find no evidence that intra-day returns or volatility differ between underpriced and overpriced firms. After the opening trade price, any price trending on the first day is not worth round trip transaction costs. These results suggest that equilibrium prices quickly establish in the secondary market, regardless of the variances in information and opinions of investors.

In order to realise initial returns subscribing investors must be able to sell IPO shares in the aftermarket. Evidence of the first trade accounting for a high proportion of first day returns suggests that IPO subscribers are the only investors to be sure of first day returns. The evidence of low bid-ask spreads and high trading volume suggest that, on average, the initial aftermarket is very liquid. Thus IPO subscribers should be able to trade out first day profits quickly and cheaply.

f. Inter-contract type variation in initial returns

The contractual forms available to an issuer depend on the listing regulations of the local exchange.[14] Between some stock exchanges there may be similar methods available but there are no exact matches between the large international markets. In most contract types IPO share prices are fixed, but a wide range of contracts with differing pricing mechanisms exists. In some contract types the price is flexible but

13 Hegde and Miller (1989) propose several factors which may distinguish IPO bid-ask spreads from seasoned stocks. First, sponsors may undertake price stabilisation to achieve a liquid market in the stock. Thus there may be a price stabilisation influence which narrows the spread in the first few days. If it assumed that the sponsor has an informational advantage over investors, then the adverse information risk he faces in the early market may be lower, causing lower spreads. It could simply be that the high level of trading volume may lead to lower spreads being necessary.

14 In Chapter 4 the contractual options available to firms listing on the London Stock Exchange are discussed in detail.

information regarding competing bids is not public, giving investors a greater portion of the issue risk. The timing of the pricing of shares may also vary considerably between issue methods, again altering the risk apportionment. Another important issue to consider is that the role of the advising investment bank as underwriter (risk taker) and allocator of shares, varies depending on the issue method adopted. All of these characteristics may affect the initial performance of the shares, as well as the direct costs borne by the issuing firm.

There is considerable inter-contract variation in IPO initial returns. From a sample of 712 IPOs, Levis (1993) reports average first day returns of 11.2% for Offers For Sale (issues available to the public) and returns of 15.28% for Placings (issues available to selected institutional investors only). As discussed in section (2.b) far fewer Placings trade to a negative return on the first day compared to Offers For Sale.[15] Kazantzis and Levis (1995) find contracting provisions are an important influence on the initial returns of IPOs on the Athens Stock Exchange. Loughran, Ritter and Rydqvist (1994) have examined the initial returns of IPOs in world stock markets, classified by contract characteristics. They find initial returns are generally higher for IPOs using contracts where the offer price is set before information acquisition; with or without discretionary allocation by the advising investment banker. Issues priced farther away from the IPO date have higher initial returns. The countries with the lowest average initial returns tend to have IPO firms that are relatively large with long operation histories and contractual mechanisms with auction-like qualities. Countries such as Korea and Malaysia, where regulations substantially influence price setting, have extremely high average initial returns.

The empirical evidence of Loughran, Ritter and Rydqvist (1994) and Levis (1993) confirms the importance of contract type to the magnitude of average initial returns. However, despite inter-contract differences in average initial returns it also appears that all contracting types are associated with positive average returns.

15 Levis (1993) posits that since Placings are the method used by small issues in the UK, the differences in first day returns may be attributable to size rather than contract type. When Placings are categorised by size, small issues have almost double the average initial return (21.2%) as large issues (12.78%).

g. Low initial returns for closed end fund, REIT and MLP IPOs

An aberrant finding in the IPO literature is the negative or insignificant first day returns found for closed end funds. In the first study of these specialist equity issuers, Weiss (1989) reports an insignificant 0.37% average first day return for a sample of 67 closed end fund IPOs issued between 1985-1987. Peavy (1990) and Barry and Jennings (1993) also find that US closed end funds are not associated with significant opening market returns.

Compared to their US counterparts UK investment trusts provide slightly higher initial returns to subscribing investors. Levis and Thomas (1995) analyse all new UK investment trusts during the period 1984-1992 and report a significant average initial return of 1.91%. They also report that UK operating IPOs over the same time period averaged first day returns of 13%. Although this study presents evidence of significant underpricing, it also confirms that initial returns for investment trust IPOs are considerably lower than operating IPOs.

Closed end funds and investment trusts are not the only type of IPO associated with low initial price reactions. Wang, Chan and Gau (1992) in a study of the performance of 86 REITs during 1971-1988 find a significant negative average initial return of -2.94%. Only 14% of the REITs in their sample traded at above the offer price on the first day. Below, Zaman and McIntosh (1992), Balogh and Corgel (1992) and Balogh (1993) also find that REITs are associated with small negative or nil initial returns. There has been no analysis of the initial returns of securitised real estate IPOs outside the US to compare with the REIT findings. Chapter 6 is the first analysis of securitised real estate IPO initial returns using non-US data.

Muscarella (1988) and Michaely and Shaw (1994) find that Master Limited Partnerships [MLPs] are another security type which have significantly lower initial returns than industrial IPOs. MLP IPOs in Michaely and Shaw's (1994) sample have

a mean initial return insignificant from zero, whilst regular IPOs are underpriced on average 8.5%. Interestingly, MLPs are often set up to hold portfolios of real estate assets.

The empirical evidence suggests the new issue market for closed end funds, REITs and MLPs are distinct from the market for operating company IPOs. To explain the variation in first day returns across these security types researchers have considered the characteristics of non-operational and operating IPOs and the predicted factors of equilibrium underpricing models. Chapter 3 discuses the explanations that non-operating IPOs have lower pricing uncertainty and lower participation by informed investors.

h. The effect of pricing uncertainty on initial returns

The most consistent cross-sectional determinant of initial returns is the ex-ante pricing uncertainty of the issuer. Many proxy variables for the uncertainty of the intrinsic value of the issuing firm have been tested in the empirical literature. For example: issue size, annual sales volume, age of company, gross proceeds, asset value, price at issue, and the number of uses of the proceeds have all been used to proxy pricing uncertainty. Pricing uncertainty characteristics are positively related to initial returns.[16]

Using the annual sales for the preceding year as a proxy for ex-ante pricing uncertainty, Ritter (1984) finds that small-sales firms have higher than average initial returns, and also greater variation in initial returns. A positive relationship with initial returns is also found using the standard deviation of daily returns for 20 days ex-post as a proxy for ex-ante uncertainty.[17] Beatty and Ritter (1986) in one of the

16 Although by far the majority of studies suggest a positive relationship between pricing uncertainty and initial returns, some aberrant results have been found. For example, in Levis' (1990) examination of value uncertainty in UK IPO markets it is reported that only uncertainty proxy variables related to the size of the firm are significant predictors of initial returns. Contradictory evidence is also presented in a study of German IPOs by Wasserfallen and Wittleder (1994).

17 The adoption of ex-post share price variability as a proxy for ex-ante uncertainty provides no predictive use but does allow exploration of theoretical hypotheses.

earliest studies report a significant relationship between uncertainty variables and initial returns in a cross-sectional regression, and a significant but low R-squared of 0.07.[18] Examining a sample of 1028 IPOs during the period 1977-1982, Beatty and Ritter (1986) find that the number of uses of funds listed in the prospectus and the inverse of issue size, positively affects initial returns.[19]

Pricing uncertainty appears to be a factor contributing to inter-industry variations in initial returns. Mauer and Senbet (1992), Michaely and Shaw (1994) and Rajan and Servaes (1994) report industry effects in initial returns. Michaely and Shaw (1994) show significant differences in the initial performance between financial (average 2.36%) and non-financial (average 8.5%) IPOs. Mauer and Senbet (1992) report similar inter-industry initial return variations. They find that industry underpricing is correlated to residual risk, decreasing offer size and decreasing age; all variables with pricing uncertainty connections.

The evidence of highly positive initial returns reviewed in this chapter presents a puzzle for theoretical research. If secondary market prices reflect fundamental value the positive price increase in early trading of an IPO is rationally interpreted as underpricing; an indirect cost of issue paid by the issuing firm. Several underpricing models reviewed in Chapter 3 reach the empirical implication that initial returns will vary positively with uncertainty about the value of the IPO. The evidence reviewed in this section suggests that uncertainty surrounding the intrinsic value of the firm is positively related to initial returns, however it should be realised that pricing uncertainty typically explains only a part of the variation in initial price reactions.

18 Beatty and Ritter (1986) point out that the low explanatory power they find is consistent with their model, which predicts a relation between expected underpricing and ex-ante uncertainty, not actual underpricing.
19 The number of uses of funds is a proxy for uncertainty because the US Securities Exchange Commission usually requires more speculative issues to provide more details of the use of funds in the prospectus.

3 LONG-RUN UNDER PERFORMANCE

a. Long-run underperformance following IPOs and SEOs

Ritter (1991) brought the anomalous long-run performance of IPOs to the head of IPO research.[20] Examining a sample of 1226 US IPOs during the period 1972 to 1984, Ritter (1991) reports an average three year raw return of 34.2%. A control sample of small firms gained 61.6% over the same period. In other words, IPOs underperform heavily in the long-run.

Several studies have verified Ritter's (1991) finding. Table 2.2 combines details of the long-run studies reviewed by Aggarwal, Leal and Hernandez (1993), Loughran and Ritter (1993) and Loughran, Ritter and Rydqvist (1994). The results presented in Table 2.2 are typically the cumulated average adjusted return from the post initial return interval until the three year anniversary.[21] As with studies documenting IPO initial returns, there are differences in the sample sizes and time periods of studies examining long-run performance. From Table 2.2 it can be seen that in most international markets IPO portfolios underperform in the long-run.

The inclusion of initial performance would, on average, cause a reduction in the observed underperformance of IPO portfolios. Levis (1993) finds that inclusion of first day returns results in long-run performance near that of several benchmarks. Keloharju (1993) also reports that including initial returns substantially reduces average long-run underperformance.[22] However, Keloharju (1993) finds that due to

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20 The underperformance phenomenon was uncovered before academic research by articles in the popular press such as Stern and Bornstein's (1982) Forbes article "Why new issues are lousy investments". Ritter's (1991) work followed Aggarwal and Rivoli (1990), and other preliminary research. Leleux (1992) provides a table summarising the international evidence of the long-term performance of IPOs up to and including Ritter's (1991) contribution

21 Both IPO initial and long-run performance studies work in event time rather than calendar time. As a consequence, in long-run performance studies first month returns are pooled across the IPO sample, even though there may be more than 10 years between the listing dates of individual IPOs.

22 Aagarwal, Leal and Hernandez (1993) report similar results. They find that including initial returns in the long-run performance of Brazilian and Chilean IPOs results in a reduction in three year underperformance by 21.4% and 23.6% respectively. Purchase of IPOs at the offer price in Chile results in (insignificant) positive three year returns.

rationing bias, average allocation adjusted long-run performance including initial returns still averages between -10.1% and -19.4%, depending on subscription size.

Three years does not appear to be the end of underperformance for IPO firms. Loughran and Ritter (1993) report that underperformance continues in their sample for five and a half years after the IPO date. Loughran (1993) reports underperformance for six calendar years following the IPO date, for NASDAQ listed firms during the period 1967-1988. Seyhun (1992) also reports that underperformance occurs for six years following the issue date. Levis (1993) states that for a sample of 346 UK IPOs he examines, underperformance continues through the fifth anniversary. The evidence suggests that underperformance can continue for five or six years.

It does not appear that long-run underperformance is a period specific phenomenon. Ritter (1991) documents underperformance during a fairly narrow time period (1972-1984). Loughran and Ritter (1995a) subsequently extend this time period to 1970-1990 and report remarkably similar results (mean three year wealth relatives of 0.830 and 0.831).[23]

23 A wealth relative is the ratio of one plus the average period return from a portfolio of IPOs divided by one plus a benchmark holding period return. A ratio less than one indicates underperformance.

Table 2.2 International evidence on the long-run performance of IPOs

Country[24]	Sample	Time Period	Adjusted 3 year Return %
Australia	266	1976-1989	-51.0
Brazil	62	1980-1990	-47.0
Chile	36	1982-1990	-23.7
Finland	79	1984-1989	-26.4
Germany	145	1970-1990	-8.3
Japan	89	1972-1989	9.0
Korea	99	1985-1988	2.0
Singapore	45	1976-1984	-9.2
Sweden	62	1980-1990	1.2
Switzerland	42	1983-1989	-6.1
United Kingdom	712	1980-1988	-8.3
United States	4753	1970-1990	-20.0

Long-run underperformance has also been found after firms issue SEOs. Loughran and Ritter (1995a) report that SEO underperformance is almost identical to that exhibited by IPOs. From a sample of 4753 IPOs and 3702 SEOs issued between 1970 and 1990, they find significant underperformance relative to non-issuing firms. The similar magnitude of underperformance across IPOs and SEOs is striking. For both SEOs and IPOs the first 6 months of seasoning does not show any evidence of underperformance. There is severe underperformance during the next 18 months. The three year matched firm wealth relative is 0.80 for IPOs and 0.78 for SEOs. Underperformance for both SEO and IPO firms continues for five years after the issue date. After 5 years the comparative statistics are 0.70 and 0.69.[25] SEO underperformance is also found by Speiss and Affleck-Graves (1995). After controlling for size, book-market ratio, trading system, and industry they conclude that the long-run performance anomaly is common across all equity issues and that there are considerable differences across industries.

24 United States; Loughran and Ritter (1995a), United Kingdom; Levis (1993), Switzerland; Kunz and Aggarwal (1994), Finland; Keloharju (1993), Sweden, Rydqvist (1993), Germany; Ljungqvist (1995), Brazil; Aggarwal et al (1993) 24, Chile; Aggarwal et al (1993), Japan; Hwang and Jayaraman (1992), Singapore; Hin and Mahmood (1993), Australia; Lee, Taylor and Walter (1993) and Korea; Kim et al (1993).

25 These measures are robust to five other benchmarks including a small firm index. Evidence that SEO firms that had gone public more than five years ago underperform more than IPOs suggests that SEO underperformance is not part of an IPO effect.

The empirical evidence documenting IPO and SEO firm underperformance has important implications for asset pricing models and market efficiency. The first potential explanation of these results is that identification of a firm as a recent equity issue correlates to a cross-sectional determinant of expected returns which is not incorporated in the expected return methodology. The evidence also leads to the conclusion that equity markets are inefficient. Constructing portfolios without new equity issuers is more profitable than holding portfolios with equity issuers; for no apparent difference in risk. Why firms issuing equity tend to perform worse than similar non-issuing firms is a puzzle explored in the review of theoretical literature contained in Chapter 3.

c. Firm characteristics associated with underperformance

While the empirical literature provides substantial evidence of the average underperformance of IPO and SEO firms, a detailed review of the results reveals some important differences in the performance of equity issuers. Ritter's (1991) analysis of IPO long-run performance uncovers significant inter-industry variations. For example, IPOs by wholesalers reported a three year wealth relative of 0.68, compared to the 1.43 wealth relative reported by financial services IPOs.[26] Levis (1993) reports three year Holding Period returns for 12 UK industries. His results suggest that there is considerable inter-industry variation in the performance of UK IPOs. Some sectors outperform two of the three benchmarks Levis (1993) adopts.[27]

Ritter (1991), Ibbotson, Sindelar and Ritter (1995) and Loughran and Ritter (1995a) identify that greater underperformance is exhibited by relatively young, growth firms that went public in the high IPO volume periods of the 1980's. In contrast, more established companies that went public in periods of low volume in the late 1970's exhibit better long-run performance. Levis (1993) also finds that the UK IPO firms

26 Underperformance is still reported in all but three of the fourteen industry groupings in Ritter's (1991) sample.
27 Exceptional industry related timing (construction issues in the late 1980's property boom) and small sample sizes are proposed to explain this

that underperform most are small young growth firms that have high levels of pricing uncertainty and typically higher initial returns. As discussed in section 2.h, small young firms typically have the highest initial returns which is attributable to their greater pricing uncertainty.

d. The relationship between initial and long run performance

There are no conclusive results that link the initial performance of an IPO with long-run performance. Ritter (1991) finds a tendency for firms with high initial returns to have the worst long-run performance.[28] Aggarwal, Leal and Hernandez (1993) find a weak positive relationship between initial and long-run performance for Brazilian IPOs. However, they also find that no relationship exists for Chilean or Mexican IPOs. Levis (1993) reports some descriptive statistics that give weak support to the hypothesis that initial returns and aftermarket performance are correlated. Levis (1993) reports that IPOs with average initial returns within the normal range (2.8%-12.1%) outperform both an all share (FTA) and small firm (HGSC) index. In Levis' (1993) sample it also appears that industries with the highest initial returns are amongst the worst long-run performers. When one outlying issue is eliminated from Levis' (1993) sample, the category of IPOs with the highest average first day return also have the greatest underperformance.

Affleck-Graves, Hegde and Miller (1996) present evidence rejecting a relationship between initial and long-run performance. Affleck-Graves, Hegde and Miller (1996) examine a sample of 1183 NASDAQ IPOs to investigate the relationship between initial and long-run performance. The results they present suggest that there are significant abnormal returns in the same direction of the initial price reaction during the first weeks of trading. After the third month of trading there is no significant difference between the returns of positive and negative first day price reaction firms.

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28 Using Ritter's (1991) database of the long-run performance of IPOs, Leleux (1992) examines the attrition rate of IPO firms. The parammetric and non parammetric survival analysis used by Lelaux (1992) determines the expected listing period of IPOs from a dependant initial return variable. The results indicate that a significant negative relationship exists, i.e. firms with relatively higher initial returns tend to delist sooner than other IPO firms

The results of Affleck-Graves, Hegde and Miller (1996) are robust to the year of issue, abnormal return calculation methods and varying IPO market conditions. In a multiple regression analysis where several variables control for value uncertainty, only the short-run price effect is confirmed. Michaely and Shaw (1994) present similar results to Affleck-Graves, Hegde and Miller (1996). From this evidence it appears that a firm with a high initial return is just as likely to underperform as a firm with a lower initial return.

e. The effect of issue activity on long-run performance

Studies examining the effect of issuing activity on long-run underperformance have provided mixed results. Loughran and Ritter (1995a) find that issues launched during heavy activity periods have substantially worse performance than those issuing in light periods.[29] Light issuers underperform by 0.17% per month, while heavy issuers underperform by 0.60% per month. The relationship between high IPO volume at birth and long-run under performance is also documented in the US by Aggarwal and Rivoli (1990), Ritter (1991), and Loughran (1993).

In contrast to the US research, studies using international data have not found a positive correlation between issue activity and long-run performance. Analysing a sample of 145 German IPOs issued between 1970 and 1990, Ljungqvist (1995) finds that IPOs from heavy issue periods, when price-earnings ratios and stock market returns were above historical averages, performed better than those that issued in light issue periods and bearish markets. The findings of Keloharju (1993) for the Finnish IPO market and Levis (1993) for the UK IPO market support Ljungqvist (1995). There is no conclusive evidence outside the US that IPO long-run performance is time dependant.

29 Light and heavy months are defined against the 60 month historical issue volume average

f. The absence of a securitised real estate IPO or SEO long-run study

Despite the contrasting initial performance of REIT IPOs, the long-run performance of securitised real estate IPOs and SEOs has largely been ignored. For example, both Loughran and Ritter (1995a), and Ritter (1991) exclude REITs from their studies of the long-run performance of US IPOs and SEOs. Levis (1993) does present evidence of the long-run performance results of UK property IPOs, but his sample is very small, and combines agency, development and real estate investment firms. Studies of securitised real estate IPOs such as Wang, Chan and Gau (1992) and Below, Zaman and McIntosh (1995) have ignored performance after the first nine months of seasoning.

The absence of a long-run study of securitised real estate equity issuers is an omission in the empirical literature. Securitised real estate firms are a significant proportion of IPO activity in many capital markets. In Chapter 5 and 7 the unique pricing mechanism and long-run performance of securitised real estate firms is examined to provide insight into the reasons behind the long-run performance anomaly.

4 HOT ISSUE AND HOT RETURN MARKETS

a. Empirical evidence of hot issue and hot return markets

The third and fourth IPO anomalies are that cycles exist in both the volume of IPOs and the average initial returns of IPOs. The hot markets phenomena in US IPO markets are reviewed in Ibbotson, Sindelar and Ritter (1995).[30] Ibbotson, Sindelar and Ritter (1995) document monthly average initial returns and IPO volume over the period 1960-1992. During the 33 year period at least 10,626 firms went public in the US; an average of more than one firm each business day. However, issue volume changes considerably over time. At least seven periods exist over the study period

30 The term hot markets is often used indescriminantly to describe two IPO traits: high issue volume periods and periods of high initial returns. Ibbotson and Jaffe (1975) were the first to document these phenomena in the US. Similar empirical

where monthly volume is greater than 60 firms. The first order auto-correlation of monthly volume over the period is 0.89.[31] This suggests that high volume months are almost certainly followed by high volume months.

There is growing evidence that variations in IPO activity are closely related to SEO activity. Loughran and Ritter (1995a) find the level of activity in the US IPO and SEO market appears to coincide. Hot issue markets exist in both equity issue markets, with IPOs having more extreme variations. Ljungqvist (1996) finds the same trait in the German new issues market. He reports a correlation coefficient of 0.63 between quarterly IPO and rights issue volume.

While the hot issue markets in Ibbotson, Sindelar and Ritter's (1995) sample are clearly visible, hot return markets are less defined. In Ibbotson, Sindelar and Ritter's (1995) initial return series average equally weighted returns were; 21.22% in the 1960's, 8.92% in the 1970's and 16.09% in the 1980's. The average initial return in all of these periods comprises intervals of high average initial returns and intervals of negligible initial returns. Over their study period at least five periods exist where average initial returns are in excess of 50%. Like issue volume, a month with a high average initial return is likely to be followed by a month with high initial returns. The first order autocorrelation of monthly average initial returns reported by Ibbotson, Sindelar and Ritter (1995) is 0.66. This suggests that future average initial returns can be forecast with high degrees of accuracy.

Hot issue markets and hot initial return periods exist in the US, but although the two effects are positively correlated, they are not coincident. Ibbotson, Sindelar and Ritter (1988) and Ritter (1984a) find a lead-lag relationship exists. Periods of high initial returns precede hot issue markets by six to 12 months. Michaely and Shaw (1994) also show that issue activity is positively related to average initial returns.

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observations have been made by Ritter (1984 and 1991), Loughran and Ritter (1995a), Rajan and Servaes (1993) and Michaely and Shaw (1994).

31 Similar highly significant first order autocorrelation coefficients are presented in Ritter (1984), one of the contributing data sources.

Hot issue and hot initial return markets have not been thoroughly examined in international capital markets. Loughran, Ritter and Rydqvist (1994) present evidence of annual IPO volume for 15 countries. They examine IPO volume in each county for a period of at least 18 years, ending in 1991. For several countries (Germany, Finland, Sweden, France, Switzerland, Italy, Australia and Japan) hot issue markets only appear to have occurred once in the 18 year study period.[32] The vast majority of these hot issue markets occur during the mid-1980's; when bull stock markets occurred world-wide. Ljungqvist (1996) reports evidence of variations in German IPO volume using quarterly data between 1970 and 1994. He finds that the arrival rate of IPOs varies considerably over time. However, the German IPO market is too small (Ljungqvist's (1996) sample comprises a total of only 189 IPOs) to make conclusions about hot issue markets.

Despite the maturity of the UK IPO market, little is known about the timing of IPOs and the appearance of hot return markets. In Levis' (1993) study of UK IPOs issued between 1980 and 1988, there appears to be a jump in issue volume over the late 1980s, but no pattern can be observed in such a short study period. Initial returns are found to vary considerably from year to year, with peaks in 1983 and 1987. Loughran, Ritter and Rydqvist (1994) analyse IPO activity in the UK over the period 1963-1991 using annual data and find that there are only two hot issue markets; around 1970 and in the mid 1980's.

In contrast to the other IPO anomalies, the hot issue and hot return market phenomena are not clearly documented outside the US. One of the contributions of the thesis is to provide extensive empirical evidence of the level of IPO activity in the UK. Using a new methodology to define IPO activity; the time between IPOs; Chapter 8 provides evidence of daily and monthly variations in IPO activity. The effect of explanatory variables on the time between IPOs is also examined in Chapter 8.

32 Ljungqvist (1996) documents variations in the annual number of IPOs in the US, UK, Sweden, Finland, Hong Kong and Korea.

In Chapter 3 the hypothesis of previous researchers that inter-temporal variation in issue activity is caused by changes in the number of positive NPV projects available to firms is discussed. Whether variations in business opportunities can explain such large variations in IPO volume is questionable however. The inter-temporal variation in IPO and SEO activity suggests that the attractiveness of issuing equity changes over time. There are two broad explanations for the attractiveness of issuing equity to change over time. First, market imperfections may result in timing benefits to firms. Second, some form of investor irrationality could lie behind volume variations. Chapter 3 reviews the theories of previous researchers, while Chapter 8 provides an original explanation for variations in IPO activity.

The dramatic variations in average initial returns are difficult to contain within the boundaries of market efficiency. If secondary market prices represent fundamental value then firms in hot return markets are giving away more than half the value of the shares issued to new shareholders. Whether firms underprice their IPOs extraordinarily or whether high initial returns the result of overvaluation is investigated in Chapter 6.

b. The effect of business and stockmarket conditions on IPO activity

Previous research suggests that firms tend to issue equity near stockmarket peaks. For the 15 countries Loughran, Ritter and Rydqvist (1994) examine, a tendency exists for high annual IPO volume to be associated with stock market peaks. Correlations between the inflation adjusted level of the sharemarket and the volume of IPOs (adjusted for population and GNP growth) are found to be positive for 14 of the 15 countries. Half of the coefficients are significant at the 1% level. Ljungqvist (1996) also finds a positive relationship between the relative level of the German sharemarket and German IPO volume.

There is also evidence of a positive relationship between business conditions and IPO activity. Ljungqvist (1996) finds a positive relationship between the OECD German

Business Climate Survey Index and German IPO volume using a Poisson regression model. Loughran, Ritter and Rydqvist (1994) undertake a set of OLS and Tobit regression analyses to test whether IPO volume is driven by changes in growth opportunities or changes in the cost of external equity capital. Although Loughran and Ritter (1993) conclude that the level of the sharemarket has more explanatory power than GNP growth, there does appear to be a positive relation between GNP growth and IPO activity in several countries.

c. Industry effects within hot markets

Industry characteristics have been shown to influence hot initial return markets. Ritter (1984) first brought the industry variation in hot return and issue markets to attention. Ritter's (1984) analysis of the composition of IPO firms recording the average initial return of 48.4% during 1980 reveals that the high returns can be attributed almost entirely to the natural resources industry. Natural resources IPOs had average initial returns of 110.9% in 1980. Ritter (1984) finds that the cause of the hot return market appears to be a large number of start-up natural resources companies. These firms were frequently issued at offering prices of 10 cents per share, were taken to the market by fringe underwriters, and had an average initial return of 140.4%. For non-natural resource industry firms, the 1980 hot return market is hardly discernible.

Other results reported by Ritter (1984) suggest that non-natural resource firms showed very little change in risk (proxied by annual sales) during the hot market. In the pre and post hot market period, natural resource IPOs showed similar risk-initial return characteristics as other firms. However, during the hot market of 1980 the relation between risk and initial return for natural resource firms changed dramatically.

Inter-industry variation in IPO volume also occurs. Ritter (1991) observed that between 1972 and 1984 US IPO volume was not evenly distributed amongst industry groups. For example, in the early 1980's oil and financial companies dominate the

IPO market. Rajan and Servaes (1994) categorise IPOs into 13 industry groups and show that there are hot issue markets in all industries but industry hot issue periods do not coincide. For example, oil IPOs peaked in 1981 with 49 new issues during the year, meanwhile there were only 2 Investment Office IPOs. In 1984, 24 Investment Office IPOs and nil Oil company IPOs occurred. Other sectors behave in some homogeneity; for example, computer, electronics and instruments industries all peaked in 1983. Levis (1993) also finds large differences in the number of issues from specific UK industries over time. Levis (1993) reports 44 issues between 1980 and 1988 that come from companies categorised as property related. During the same period there were only 17 publishing and printing companies (less than half) and 82 electronics companies (almost double).

5 CONCLUSION

The least contentious issue in the IPO empirical literature is that large positive average initial returns accrue to IPO investors. Positive average initial returns occur in most capital markets. The world average initial return is approximately 19%, with initial returns in the US and UK averaging around 15%. Several characteristics influence the level of initial returns.

Uncertainty surrounding the value of the IPO has a positive influence on initial returns. This characteristic is very important to the underpricing models reviewed in the next chapter. Pricing uncertainty is also a characteristic linked to long-run performance. The commonality of: (i) greater initial returns occurring with small growth stocks, and (ii) small growth stocks being the worst long run performers, suggests that pricing uncertainty may be crucial to explaining both the IPO performance anomalies. Chapters 6 and 7 are concerned with the effect of pricing uncertainty on initial and long-run performance.

In contrast to the evidence surrounding operational IPOs, investors should not expect positive initial returns from closed end funds, REITs or MLPs. The market for these

IPOs is distinguishable from other operating IPOs. Tests of reasons why securitised real estate IPOs have low price reactions are undertaken in Chapter 6. This the first examination of securitised real estate initial returns using non-US data. Despite the insightful findings REIT IPOs provide for the initial return literature they are have been excluded from long-run performance studies of operating company IPOs. Similarly there has been no long-run performance study specifically focused on securitised real estate firms. The long-run performance of securitised real estate firms is the subject of Chapter 7.

This chapter has examined the ability of subscribers to realise profit from initial price changes. Differences in contract types appear to significantly influence the magnitude of initial returns. As the contracting mechanism becomes less auction like, the higher initial returns tend to be. Evidence from intra-day price data suggests that the sole beneficiaries of initial returns are the subscribers. Evidence of higher than normal trading volume and narrower than normal bid-ask spreads for IPO shares, in the initial after-market, suggest that subscribers are able to trade-out initial profits quickly and cheaply. It appears that IPOs may provide large abnormal profits to subscribing investors, however other factors must be considered. It is an important characteristic of IPO markets that rationing occurs for issues with high initial returns. It also appears that small issues have higher than average initial returns. Thus, the evidence suggests that gross proceeds weighted returns and allocation conditional returns to investors are substantively less than equally weighted returns. This is consistent with the evidence that IPOs have a positively skewed distribution of initial returns, caused by a few negative observations, many near zero and a few high fliers. If the high fliers are rationed heavily it is not surprising that investors attempting to purchase an equal proportion of each issue receive only normal returns on average.

Evidence of extraordinarily high initial returns in hot return markets presents an interesting empirical question. Are high initial returns the result extraordinary underpricing, or are IPOs overvalued by investors in hot return markets? Chapter 6

investigates this question using the special valuation characteristics of a sample of UK Property Investment IPOs.

Long-run performance studies report bad news for IPO investors. On average significant long-run underperformance occurs following an IPO in most capital markets. Empirical studies of long-run performance calculate performance after the initial return period, suggesting subscribers will receive better buy-hold returns compared to secondary investors. There is mixed evidence on the information given by the initial price reaction regarding long-run performance. In the absence of other information it would pay subscribers to sell out of all IPOs after the initial period.

Although average underperformance is found in most capital markets, there are cross-sectional differences in long-run performance. Previous studies suggest that underperformance is concentrated in small, young firms. The industry of the issuers also appears to influence long-run performance, but which industries underperform most or least has not been identified. Importantly these characteristics are similar to the determinants of initial returns and are associated with pricing uncertainty.

SEO firms also perform poorly relative to non-issuers. The commonality of aftermarket performance for new and seasoned equity issuers suggests that the decision to issue external equity lies behind underperformance. Any explanation for IPO underperformance should also be consistent with the SEO literature.

IPO and SEO hot issue markets are intriguing characteristics of capital markets. The auto-correlation of monthly IPO volume suggests that imperfections in new issue markets result in timing benefits to firms. Like the other IPO anomalies, some form of investor irrationality could also underlie activity variations. Previous literature explaining inter-temporal variations in issue activity is discussed in the next chapter, and the explanation of this thesis is presented in Chapter 8.

In sum, this chapter has examined empirical evidence which is key to the empirical research of the thesis. The importance of pricing uncertainty to IPO initial and long-run performance stimulates the empirical analyses of Chapters 6 and 7. The absence of a securitised real estate long-run performance study, and the commonality of IPO and SEO underperformance motivates Chapter 7. The question of whether extraordinarily high underpricing occurs in hot return markets is empirically examined in Chapter 6. Inter-temporal variations in issue activity are examined in Chapters 8 and 9.

CHAPTER 3

An Evaluation Of Theories Explaining The Behaviour Of IPOs

1 INTRODUCTION

Chapter 2 identified four anomalies surrounding IPOs: positive average initial returns, long-run underperformance, hot issue markets, and hot return markets. The behaviour of IPOs can be viewed as resulting from either market imperfections and miss-specified asset pricing models, or irrational behaviour in the primary equity market. The objective of this chapter is to evaluate the existing explanations for the behaviour of IPOs, with particular focus on the anomalies addressed in the remainder of the thesis.

The positive average initial returns anomaly has received the most theoretical attention. Models attempting to explain positive average initial returns typically provide reasons why firms would want to underprice their IPOs. Several models have focused on the market participants and the existence of information asymmetry between these parties. Often the theories predict that pricing uncertainty increases required underpricing. The underpricing theories are not mutually exclusive, and a given rationale may be more important for some IPOs and not others. Time variation in the factors proposed by underpricing models are held as possible explanations of inter-temporal variations in initial returns.

Rational explanations for hot issue markets and long-run underperformance are scarce. This review finds that the most accepted explanation of underperformance relies on irrational behaviour by investors. The cognitive bias theory contends that long-run underperformance is caused by overvaluation at the issue date. The cognitive bias explanation for overvaluation is based on investors overweighting

recent operating performance when forming expectations. Explanations for hot issue markets include changing business opportunities, overvaluation timing and market imperfections that relate to business conditions. The impact of market imperfections on IPO activity, and the cognitive bias explanation of underperformance are identified as promising directions for research that are examined in later chapters.

The remainder of the chapter is organised as follows: In section 2 theories of positive average initial returns are discussed. In section 3 explanations for hot issue markets and long-run underperformance are examined. Section 4 concludes with a discussion the IPO behaviour that subsequent chapters of the thesis attempt to explain.

2 THEORIES OF POSITIVE AVERAGE INITIAL RETURNS

a. Asymmetric information between the issuer and investment banker

One sect of theorists has proposed that information asymmetry between issuers and investment bankers is the cause of IPO underpricing. Baron (1982) hypothesises that investment bankers take advantage of their superior market knowledge and deliberately underprice IPOs. This ingratiates investment bankers to investors and allows them to expend less marketing effort. IPOs with higher pricing uncertainty give investment bankers more opportunity to take advantage of their information advantage and end up being underpriced more. Thus the model predicts a positive relationship between pricing uncertainty and initial returns.

Baron's (1982) scenario probably occurs in some instances but it is not likely to be the sole cause of positive average initial returns. Evidence of investment banking company IPOs, reported by Muscarella and Vetsuypens (1989), shows that investment bankers underprice themselves as much as other firms of similar size. Examining 38 IPOs of investment banks that issued their own securities over the period 1970-1987 Muscarella and Vetsuypens (1989) report statistically significant initial returns averaging 7.12%. 28 of the 38 firms had positive initial returns.

Evidence of positive average initial returns in markets where investment bankers do not have a role in pricing places further doubt on the completeness of Baron's (1982) model. In the Chile IPO market, where there is an auction system and no underwriters, Aggarwal, Leal and Hernandez (1993) report an average initial return of 16.3%. The results of Muscarella and Vetsuypens (1989) and Aggarwal, Leal and Hernandez (1993) confirm it is unlikely that investment banker manipulation is the cause of positive initial returns.

b. Law suit avoidance

Following comments by Ibbotson (1975), a part of the IPO literature attempts to explain underpricing as the product of investment bankers trying to reduce the severity and frequency of law suits. In the US, the effect of the Securities Act 1933 is that all participants in an IPO that sign the prospectus are liable for material omissions. Tinic (1988) develops a legal insurance argument where underpricing is used to reduce the severity and frequency of law suits. According to Tinic's (1988) lawsuit avoidance theory positive initial returns from IPOs serve to reduce: (i) the probability of a lawsuit, (ii) the conditional probability of adverse lawsuit judgements, and (iii) the amount of damages if there is an adverse judgement.

Empirical evidence suggests that legal insurance is unlikely to be a major factor in underpricing. Drake and Vetsuypens (1992) examine the initial returns of 93 firms that were sued after their IPO. They find no difference between the average initial return for these firms and a control sample matched by size. Second, they find that the level of underpricing would be an extraordinarily expensive legal insurance premium if that was it's sole purpose. Vos and Cheung (1991) find that changes in legal conditions in New Zealand that should make IPO firms and their advisers more vulnerable to lawsuits made no difference to average underpricing. Keloharju (1993) finds that there are no law suits against Finnish IPOs issued between 1984 and 1989, yet initial returns averaged 8.7%.

c. Signalling theories

Signalling models of IPO behaviour are available in a number of varieties. They all rely on the existence of asymmetric information, and have the same basis in that issuing new shares at a price below intrinsic value is a device to signal information; however the specific signalling arrangements differ. These models differ from other explanations of IPO underpricing in two fundamental ways. First, the issuer is endowed with superior information rather than investment bankers or outside investors. Second, the issuers explicitly consider the possibility of future equity issues in deciding on IPO prices.

Ibbotson (1975) first suggested that IPOs may be underpriced to "leave a good taste in investor's mouths". Signalling models by Allen and Faulhaber (1989), Welch (1989) and Grinblatt and Hwang (1989) have formalised the rationale that new issues are underpriced to signal quality to investors, thereby allowing companies to issue future equity at favourable prices. In these models issuing firms have secret information about the value of the firm and companies follow a strategy in which a seasoned offer follows the IPO. To compensate for the signal cost they must benefit at the subsequent issue. If investors become aware of the value of the firm before the seasoned issue the underpricing of the IPO will have little affect on the price of the subsequent issue. This deters low value firms from copying high value firms because the expected benefit to low value firms is reduced by the probability of value discovery.

Signalling models generally imply that firms that underprice more are: (i) more likely to issue seasoned equity, (ii) likely to issue larger amounts of seasoned equity than in the IPO, (iii) likely to issue seasoned equity more quickly after the IPO, and (iv) likely to experience a smaller negative price reaction on announcement of the seasoned issue.[33]

33 Announcements of seasoned equity issues are normally met with a negative price reaction. See Smith (1986).

Jegadeesh, Weinstein and Welch (1993) test the implications of signalling models and find little evidence to support the theoretical conclusions that initial returns relate to future seasoned equity issues. Their results suggest weak predictability of subsequent issues from initial returns; but this occurs only when there are extreme initial returns. Furthermore, aftermarket returns are a stronger predictor of seasoned activity than the initial return. These results are confirmed in the analyses of Michaely and Shaw (1994), Garfinkel (1993) and Levis (1995). [34]

Allen and Faulhaber (1989) contend that investors update their beliefs about the value of a firm through its earnings or dividend policy. Their model infers that high intrinsic value firms will underprice more and have higher earnings, earlier dividend distributions, and higher payout ratios. Allen and Faulhaber (1989) suggest that the market views firms that underprice and pay high dividends more favourably than firms that follow the same dividend policy but do not underprice. Additional implications are that earnings performance, dividend performance, and price reactions on dividend announcements will be positively related to initial returns. Contrary to the implications of Allen and Faulhaber (1989), Michaely and Shaw (1994) find there is a negative relationship between initial returns and future earnings and dividends. Furthermore, price reactions to dividend announcement appear homogenous across firms with differing initial returns.[35]

34 Michaely and Shaw (1994) show that there is no relationship between initial underpricing and subsequent debt or equity issues. Using a database of 889 US IPOs issued between 1984 and 1988, Michaely and Shaw (1994) also test other hypotheses based on signalling models and find limited evidence to support the conclusions posited. Garfinkel (1993) using a sample of 494 IPOs issued between 1981 and 1983 tests signalling hypotheses and finds that no relation exists between IPO underpricing and the probability of reissue. In a study of 713 UK IPOs Levis (1995) examines long-run performance and subsequent reissue activity. Levis (1995) finds no relationship between the magnitude of first day returns and reissue activity, although high first day return firms may reissue quicker than other IPOs.

35 The studies by Michaely and Shaw (1994) and Jegadeesh, Weinstein and Welch (1993) use US data from a similar period. It is therefore possible that the results are limited to US IPO markets or are time sensitive. Tests of signalling models using data from international markets during varying time periods have not unanimously rejected signalling hypotheses. For example, Kelohaju (1993) analysing a sample of 91 Finnish IPOs and 47 seasoned offers finds a positive relation between underpricing and issue activity, which supports signalling models. On the other hand, evidence of IPOs undertaken on the Toronto Stock Exchange during 1971-1983 reported by Krinsky and Rotenberg (1989) suggests that insider holdings are not a signalling device, consistent with US evidence.

d. Partial adjustment and information revelation

Ibbotson, Sindelear and Ritter (1995) describe a partial adjustment phenomenon in US IPO markets. IPOs that have their final offer prices revised upwards have high initial returns. It appears that investment bankers raise offer prices only partially toward the true value of the shares, giving investors the surplus. Why this is the case is mysterious. Benveniste and Spindt (1989) formalise the argument that investment bankers may underprice IPOs to induce regular investors to reveal their valuations during the pre-selling period. The motivation for investors to reveal information in the pre-selling period is a greater expected profit from being truthful rather than deceptive. A trade-off between the level of underpricing and the allocation of shares forms the expected profits. So long as allocations increase at a greater rate than returns decrease truthful investors will be better off than deceivers.

The implication of Benveniste and Spindt's (1989) model is that IPOs which have offer prices revised upwards in the pre-selling period should have higher initial returns than those firms with valuations revised downwards. This pattern is documented by Hanley (1993) and Barry and Jennings (1993) in US IPO markets. No international evidence has been provided to test the model's implications. While the partial adjustment effect appears to be present in the US, it is improbable that information revelation is a principal cause of positive average initial returns. The presence of high initial returns in auction markets with no underwriters such as the Chile IPO markets, [see again Aggarwal, Leal and Hernandez (1993)] suggests this explanation is by no means complete.

e. Asymmetric information, rationing and adverse selection

The most accepted and empirically supported underpricing model is presented by Kevin Rock. Rock (1986) argues that the underpricing discount is a necessity to attract uninformed investors, disadvantaged by asymmetric information and share rationing.

Rock (1986) considers that some investors will be able to forecast the true worth of an issue (informed investors) and others are uninformed. Informed investors will buy an issue only if it is priced below fundamental value; and then they bid heavily. Uninformed investors do not know if an issue is under or overpriced and therefore will be allotted only a portion of the underpriced issues and all of the overpriced issues. This situation can worsen if the sponsor has power to allocate shares to favour informed investors such as large institutions.

The winner's curse (or adverse selection problem) brought to attention by Rock (1986) is that if uninformed investors get all the shares that they demand, it is because they are overpriced and informed investors are not in the market for them. Therefore, rational uninformed investors will only buy new issues if IPOs are sufficiently underpriced on average to cancel out the bias in the allocation of new issues. Rock's (1986) analysis shows how the equilibrium offer price includes a discount to attract uninformed investors. The discount can also be seen as a form of compensation to investors for the cost of becoming informed.

There has been more empirical work on Rock (1986) and derived models than any other IPO theory. In Rock's (1986) model rationing in IPO markets is crucial to equilibrium underpricing. If the model is correct rationing should be observed, especially for issues with high initial returns. Furthermore, weighting the initial returns by the probability of obtaining an allocation should result in uninformed investors earning the risk free rate of return. As discussed in Chapter 2, international evidence from Koh and Walter (1989), Levis (1990) and Keloharju (1993) support both these implications.

Essential to Rock's (1986) model are the uncertainty of the intrinsic value of the IPO, the existence of asymmetric information, and the enforcement of equilibrium underpricing. Dissatisfaction with the theoretical fine-tuning of the model and has lead to derivative models. These second generation models formalise the positive affect pricing uncertainty [Ritter (1984), Beatty and Ritter (1986)], and the negative

affect investment banker reputation [Carter and Manaster (1990)] have on underpricing. Besides the predictions of Rock's (1986) model there are testable implications provided by these theoretical extensions.

Attention has focused on the arguments contained in Rock (1986), Ritter (1984) and Beatty and Ritter (1986) to explain the insignificant first day returns found for non-operational IPOs. Peavey (1990) suggests the units of closed end funds, are backed by assets (shares) with a relatively high liquidity and therefore funds have a degree of valuation certainty. Below, Zaman and McIntosh (1995) argue REIT IPO initial returns are also consistent with the uncertainty implications of Rock (1986). Wang, Chan and Gau (1992) shift the causal emphasis to the symmetry of information between market participants rather than pricing uncertainty. Wang, Chan and Gau (1992) propose that the dominance of uninformed retail investors explains the apparent overpricing they find. The effect of pricing uncertainty and informed traders on the initial returns of securitised real estate IPOs is examined in Chapter 6.

Overall, empirical tests of Rock's (1986) model provide supportive results. Beatty and Ritter (1986), Miller and Reilly (1987), James and Weir (1990), and Michaely and Shaw (1994), amongst others, find initial returns increase in pricing uncertainty and investor heterogeneity, and decrease with investment banker reputation.[36] However, the theoretical explanation of these empirical effects is yet to be conclusively decided. For example, pricing uncertainty is a determinant of underpricing in several IPO models, not Rock derived models alone.

Although Rock (1986) is probably the most well supported underpricing model, some parts of the explanation are less than convincing. It is not clear why issuers should want to underprice to attract uninformed investors. The evidence of rationing reviewed in Chapter 2 suggests that underpricing to attract uninformed investors may not be necessary. As Ruud (1993) notes, it could be argued that rationing occurs because uninformed interest has been attracted. Moreover, there is likely to be a "free

36 Although in general empirical results support the predictions, there are contradictory results reported [see for example Wasserfallen and Wittleder (1994), Wang, Chan and Gau (1992) and Levis (1990)]

rider" problem amongst issuers that will deminish the desire of any one issuer to sacrifice proceeds for the sake of maintaining an aggregate level of uninformed demand.

The only tested implication that explains hot return markets from a Rock derivative model is temporal variation in the pricing uncertainty of IPO firms. Ritter (1984) hypothesises that as uncertain IPOs tend to be underpriced more than certain IPOs, changes in the risk of firms going public may be able to explain swings in initial returns. The evidence of Ritter (1984) reviewed in Chapter 2 suggests that firms are not more risky in hot return periods. Ritter (1984) concludes that the amplitude of average initial returns is far greater than that explained by changes in the risk of issuers.

f. Market segmentation

Mauer and Senbet (1992) develop a model where there is segmentation between IPO companies and the seasoned market. Underpricing is the result of incomplete spanning of IPOs in the secondary market. At the offering stage firms trade in the primary market and may have few comparable firms in the secondary market. The difference between secondary market price and primary offer value is attributable to a primary market risk premium. The premium is a function of the incomplete scaning of the secondary market and the level of investor access to the primary market. In this model the absence of a perfect substitute for a new issue in the secondary market causes an underpricing discount, even if no information asymmetry exists. When IPOs enter the secondary market they deminish the spanning problem faced by subsequent similar IPOs. This industry effect results in lower underpricing for subsequent IPOs.

Mauer and Senbet's (1992) model predicts: (i) The greater the variance in the unspanned cash flows of the IPO, the greater the underpricing. Thus pricing uncertainty should be positively related to underpricing. (ii) IPOs that occur later

within a group of IPOs from the same industry should have reduced substitutability problems. Thus later issues should exhibit lower initial returns than earlier IPOs. Mauer and Senbet (1992) test their model on a sample of 1002 US IPOs issued between 1977 and 1984, and find results supportive of their predictions. However, the variables used; size and residual risk for example; are also used in tests of Rock's (1986) model.

g. Price stabilisation

In the US, underwriters can and do practice IPO price stabilisation.[37] This is a legal activity under Rule 10b-7, of the Securities Act of 1934. Stabilisation or underwriter price support is intended to facilitate distribution of a new issue. Stabilisation involves transactions that retard the decline in the market price of a stock. The maximum price support for IPOs is the offer price. There is no time limit for stabilisation under Rule 10b-7 however practitioners claim it seldom lasts longer than 2-4 days. Although practitioners appear reluctant to discuss the frequency of stabilisation transactions, evidence reported by Hess and Frost (1982) suggests that stabilisation can occur in over half US new issues.[38]

Ruud (1993) shows that if deliberate underpricing occurs, the distribution of initial returns should have a normal shape (if forecast errors are normal), but should be shifted by the level of underpricing. This does not agree with the positively skewed and peaked at zero shape of IPO initial returns described in Chapter 2. Ruud (1993) contends that underwriter price support explains the distribution of IPO returns. The effect of stabilisation is to reduce the number of negative initial returns. Observations that would have occurred in the left tail of the distribution are displaced toward zero returns by standing orders at or near the offer price. This censoring could produce a positive mean even if offer prices were set at expected market value.

37 Readers are referred to a summary of the practice and law of price stabilisation in the US contained in Ruud (1993).
38 Practitioners emphasise that the direction of market prices dictates the need for stabilisation. Thus, given that IPOs usually coincide or are timed in rising markets the need for stabilisation is not great.

Ruud (1993) tests the hypothesis that investment banker price stabilisation explains high initial average returns. Four of the results she reports are particularly consistent with the initial impact and gradual withdrawal of investment banker price stabilisation: (i) The minimum daily returns drop dramatically from the first day to the first week (-0.288 to -0.429), however the maximum return remains unchanged (0.626 to 0.658). (ii) The first day return distribution is positively skewed and peaked at zero; however as the period post issue increases, the distribution of returns becomes normal.[39] (iii) When the artificial shortening of the left tail is taken into account, the revised initial return mean is close to zero and the distribution appears symmetrical, consistent with ordinary daily returns.[40] (iv) Most firms (69%) with zero initial returns subsequently report zero or negative one week returns.[41]

Hanley, Kumar and Seguin (1993) support Ruud's (1993) findings with indirect evidence of price stabilisation in 1523 NASDAQ IPOs issued between 1982 and 1987. During the first 2-3 weeks after the IPO they find evidence that price stabilisation significantly affects quoted bid-ask spreads. Quoted spreads are narrower when prices are close to the offer price, which is likely to be when stabilisation occurs. They also find predictable price declines when stabilisation is assumed to have been withdrawn.

There has been little international evidence of the affect of price stabilisation on initial returns. The UK Securities and Investments Board (SIB) have stabilisation rules in Chapter III, Part 10 of the SIB Rules that are comparable to Rule 10b-7. There have been no UK studies of the practice or influence investment banker's stabilisation transactions have on IPO initial returns. Kazanztis and Levis (1995) show that stabilisation affected the initial returns of IPOs listing on Athens Stock Exchange before the requirement for price support was abolished in 1991. Deducting the value of the put-option created by pricing support from initial returns, Kazanztis

39 Normality tests based on kurtosis and chi-square goodness of fit tests are failed in the one day, one week, two week and three week cases but are accepted in the four week case

40 The tobit estimate of mean initial returns is 1.5% compared to the arithmetic mean of 6.4% and the median of 2%.

41 For 25% of the IPOs in Ruud's (1993) sample the initial return was zero. Only 8% of these firms report higher than 5% first week returns. Firms that report a first day return of 0-5% only 8% report an increase in price whereas 47% report negative one week returns. Ruud (1993) concludes that the migration of observations in the 0-5% range in the one day interval to the negative tail in the one week interval is consistent with underwriter support over the first week

and Levis (1995) find that price support cannot explain all of the observed initial returns.

Stabilisation challenges the assumption of deliberate underpricing and replaces it with an activity that is likely to be costly to investment bankers. It would appear likely that the investment banker's fee incorporates an allowance for price support activities.[42] Thus the firm does not pay any more for an IPO than the direct costs; implied underpricing costs do not exist. However, a major criticism of stabilisation as an explanation for positive average initial returns is that it does not take into account the time variation in initial returns. Chapter 2 discussed the appearance of markets where initial returns are greater than 50%. If this represents only the middle and right tail of the initial return distribution then the implication is that IPO prices must be very uncertain during hot return markets. However, pricing uncertainty is not the cause of hot return markets [again see Ritter (1984)] and explains only a part of cross-sectional variation initial performance.

3 THEORIES OF HOT ISSUE MARKETS AND UNDERPERFORMANCE

a. Excessive optimism and cognitive bias

Miller (1977) provides an over-optimism explanation for underperformance that depends on pricing uncertainty. He argues that the buyers of IPOs will be the investors who are most optimistic. If there is uncertainty surrounding the price of an issue, the valuations of optimistic investors could be much higher than those of pessimistic investors. Uncertainty reduces as information about the new firm becomes available. This causes the differing views of optimists and pessimists to converge, resulting in a price decline. The implication of Miller's (1977) theory is that IPO firms should underperform non-issuers as information is revealed in the aftermarket.

42 The cost sharing of stabilisation transactions among syndicates is typically in proportion to the members allotment and are expressed in the Agreement Among Underwriters.

Ritter (1991), Levis (1993), Rajan and Servaes (1994) and Loughran, Ritter and Rydqvist (1994) all argue that firms appear to go public when investors are over-optimistic about the prospects of new firms. Recently Loughran and Ritter (1995a) and Speiss and Affleck-Graves (1995) reason that if IPOs occur in periods when IPOs are over-valued, so that investors subsequently realise low returns, seasoned firms are likely to behave similarly, thereby extending the rationale to both IPOs and SEOs.

Loughran and Ritter (1995b) attempt to define the mechanism causing over-optimism. They focus on the work of De Bondt and Thaler (1985) who have introduced the behavioural psychology finding that humans tend to overweight recent experience in decision making. Loughran and Ritter's (1995b) rationale, because of its origin in psychology, is called the cognitive bias hypothesis. The premise of the cognitive bias explanation is that issuing firms have typically experienced recent improvements in their operating performance.

Loughran and Ritter (1995a) state:

"..the market overweights this recent improvement and underweights long term mean reverting tendencies...at the time of issue market prices reflect the capitalisation of transitory operating performance...when the transitory nature of operating performance comes apparent the stocks underperform".

In other words, the market is systematically miscalculating the auto-correlated earnings growth of equity issuers, resulting in overvaluation at the issue date. When operating performance does not meet expectations, underperformance relative to non-issuers occurs. Several operating performance studies support the cognitive bias explanation. Jain and Kini (1994) report evidence from a sample of 682 firms during the 1976-1988 period. Their results show that the median ratio of cash flow to assets fell considerably between the year before going public and three years later. Mikkelson and Shah (1994) find sales growth out runs cash flow performance after the issue date. Rajan and Servaes (1994) find that analysts overestimate the future earnings of IPOs, indicating the presence of cognitive bias. Cognitive bias is presently the most accepted explanation of underperformance. The robustness of this

theory to the long-run performance of Property Investment and Property Development IPOs and rights issues is examined in Chapter 7.

b. Overvaluation timing

Although the cognitive bias explanation predicts overvaluation, it does not address the issue of whether firms know the extent of overvaluation and deliberately time their equity issues to take advantage of new shareholders. Over-optimism could be independent of the firm's decision of when to issue, or it could be the driving factor. This thesis defines overvaluation timing as the practice of firms deliberately timing equity issues for when overvaluation occurs. Overvaluation timing has several empirical implications that have been examined in previous studies.

Evidence of firms managing their earnings support the hypothesis that firms deliberately attempt to issue overvalued equity. Teoh, Wong and Rao (1994a) argue that there will be both good opportunities and strong incentives for IPO firm managers to undertake active earnings management. This is because the IPO market relies on financial statements for valuation (as little other information is available) and there are information asymmetries between investors, owners and investment bankers. They argue that swelling earnings will have a beneficial short term valuation effect. Teoh, Wong and Rao (1994a) examine net income and cash flow before and after the issue date. They find that high net income and cash flow occur in the year preceding the IPO, followed by high industry adjusted accruals in the IPO year. In the year after the IPO there are low discretionary accruals, low net incomes and decreases in cash flows. Net income on average takes three years before stabilising and cash flow takes six years.

If heavy issue periods occur because firms deliberately attempt to raise equity in opportunistic windows of overvaluation, issues timed for heavy activity periods should perform substantially worse (in the aftermarket) than firms that issue equity in light periods. In Chapter 2 the mixed evidence concerning the relationship between

long-run performance and issue activity was discussed. This implication is supported in the US [Loughran and Ritter (1995a) and others] but in other markets it is refuted [Ljungqvist (1995) and others]. Thus, tests of this implication of the overvaluation timing hypothesis have neither proved nor disproved the validity of the theory. Chapter 7 examines the relationship between issue activity and long-run performance, for firms of distinguishable pricing uncertainty, to test the validity of the overvaluation timing theory.

Significant evidence against overvaluation timing stems from the relationship found between the proportion of equity sold and long-run performance. Ljungqvist (1995) argues that indirect support for overvaluation would be to find the proportion of equity sold in an IPO negatively related to aftermarket performance. His results confirm the contrary. Only firms that retain large stakes significantly underperform in the German IPO market.

More evidence against overvaluation timing comes from the SEO literature. Realising the differences between a rights issue to existing shareholders and an offering to new shareholders, Affleck-Graves and Page (1995) consider whether deliberate timing by managers can explain the long-run performance of rights issues. They argue that rights issues remove the wealth transfer that arises from managers selling overpriced equity to new shareholders.[43] As a consequence, there is no incentive for managers to issue rights when the firm is over-valued. Any long-run underperformance for rights issuers is thus not a result of deliberate timing to take advantage of new shareholders. Affirming this, Affleck-Graves and Page (1995) conclude the significant long-run underperformance of South African rights issuers, found in their study, cannot be explained by timing to take advantage of new shareholders. Chapter 7 examines the benchmark adjusted performance of both rights issues and IPOs to test whether the rights issue mechanism results in differing post-issue performance than that exhibited by firms that issue equity to new shareholders.

43 Myers and Majluf (1984) contend that rights issues resolve the conflict between existing and new shareholders if existing shareholders exercise their rights and hold the new shares.

c. Business opportunities

Variation in business opportunities provides a sensible explanation for variation in IPO activity. Over the business cycle there are some periods when there are better investment opportunities available to firms. In these periods firms would be expected to raise external capital and for the level of the stock market to be high. Hot issue markets and the trend for firms to issue near stock market peaks could be because of normal business cycle variations. Loughran, Ritter and Rydqvist (1993) argue firms go public together because business conditions are better, firms have more positive NPV projects, and thus higher funding needs. Evidence reported by Ljungqvist (1996) and Loughran, Ritter and Rydqvist (1993), reviewed in Chapter 2, find some support for the business opportunities hypothesis.

On an industry level the rationale is persuasive. As industries face technological expansions at different times and different economic conditions, the prospects for projects and therefore the demand for capital varies between industries. This sits well with the evidence of non-coincident industry hot issue periods reviewed in Chapter 2. However, the main difficulty with this explanation is that the supply of business opportunities would have to be very volatile to explain the dramatic increases in volume found in IPO hot issue markets. Thus it appears that some other timing factor contributes to inter-temporal variation in IPO activity.

d. Market imperfections and business conditions

There have been no equilibrium models linking IPO activity to market imperfections that vary with business conditions. However, recently there has been interest in business cycles and the timing of seasoned equity issues. Bayless and Chaplinsky (1996), Choe, Masulis and Nanda (1993), Berkovitch and Narayanan (1993) and Lucas and MacDonald (1990) present SEO theories that rely on the existence of

imperfections such as information asymmetry, and how these imperfections vary in economic expansions and recessions.[44]

The evidence from the SEO literature suggests equity issues become more prevalent when business conditions are relatively good. Hickman (1953) and Moore (1980) show that periods of high activity in US SEO markets coincide with business conditions during the periods 1900-1938 and 1946-1970 respectively. Choe, Masulis and Nanda (1993) find that over the period 1971-1991 seasoned firms have issued equity more frequently following a stock market rally and in expansionary business conditions. Bayless and Chaplinsky (1996) also find the volume of equity issues increase with macroeconomic and stock market variables.

It has also been found that information asymmetry costs are lower in better business conditions. Choe, Masulis and Nanda (1993) find lower announcement price declines in better business conditions. These results are consistent with their proposal of time varying adverse selection costs. Bayless and Chaplinsky (1996) document that firms issuing SEOs in hot issue markets have lower announcement price reactions.

Given the similarities between the SEO and IPO decisions, and the similar market imperfections (e.g information asymmetry and direct costs) the SEO models potentially give great insight into IPO behaviour. This thesis adapts the rational framework presented in these models to the IPO market. Chapter 8 provides an explanation for the timing of IPOs based on the ideas of Choe, Masulis and Nanda (1993) and Bayless and Chaplinsky (1996). Windows of opportunity are hypothesised to occur in IPO markets as a result of lower costs of going public.

44 The usual definition of expansions and recessions recognised by economists is by Burns and Mitchell (1946 p3): " Business cycles are a type of fluctuation found in aggregate economic activity of nations that organise their work mainly in business enterprises: a cycle consists of expansions occurring at about the same time in many economic activities, followed by similarly general recessions, contractions, and revivals which merge into the expansion phase of the next cycle; this sequence is recurrent but not periodic; in duration business cycles vary from more than one year to ten to twelve years; they are not devisable into shorter cycles of similar character with amplitudes approximating their own."

4 CONCLUSION

a. A review of IPO literature

The behaviour of IPOs has attracted a variety of explanations. This chapter has attempted to give a reasonably comprehensive coverage of the most interesting and empirically valid theories. Overall the theories have brought considerable insight into the behaviour of IPO firms, but unfortunately, they do not conclusively explain the main anomalies.

The focus of the pre-1990s literature was explaining positive average initial returns. Underpricing models concentrate on information asymmetries that exist in the IPO market and how these imperfections result in a required underpricing discount. Underpricing models often infer that uncertainty surrounding the intrinsic value of an IPO is the crucial factor in determining the underpricing discount required by investors and thus the magnitude of initial returns. Given the potential conflicts between issuers, investment bankers, and investors, and the unavailability of information regarding new firms, this appears a very valid approach.

Empirical evidence supports the implications of Rock (1986) and the derivative models of Beatty and Ritter (1986) and Carter and Manaster (1990). Rationing, informed investor participation, pricing uncertainty, and investment banker reputation are likely to play a large part in future IPO research. However, the predictions of these models are also made by other theories. For example, Mauer and Senbet's (1992) segmentation model and Baron's (1982) information asymmetry model also predict that pricing uncertainty should determine underpricing discounts.

The partial adjustment explanation of Benveniste and Spindt (1989) and the price stabilisation theory of Ruud (1993) are both based on the behaviour of investment bankers during the IPO process. The activities of gathering information prior to issue

and the support of prices in the aftermarket are likely to be important to observed initial price reactions. The stabilisation evidence of Ruud (1993) compels future research to investigate the aftermarket activities of investment bankers in other countries. However, both partial adjustment and stabilisation have criticisms. First, they rely on the institutional characteristics of the US market and therefore may not be applicable to other countries. Second, they have difficulty in explaining hot return markets.

Of the underpricing models reviewed in this chapter several have predictions that are counter to empirical evidence. Models based on: law suit avoidance, information asymmetry between issuer and investment banker, and signalling quality for subsequent equity issues, are discarded as complete explanations for positive initial returns because of the weight of empirical evidence against them.

The common criticism that applies to all underpricing models is that they do not adequately address the issue of time variation in initial returns. The hypothesis that a change in the pricing uncertainty of issuers causes hot return markets is rejected by Ritter (1984). Except for Mauer and Senbet (1992) time variation of underpricing has hardly been considered. The conclusion from both this chapter and Chapter 2 is that hot initial return markets are crucial to the understanding of the initial return anomaly; yet they are relatively unresearched outside the US market.

Hot return markets have two possible interpretations: hot return markets are periods of extraordinary underpricing, or they are evidence of market inefficiency. Chapter 6 of the thesis attempts to contribute to the understanding of initial returns by testing these theories. To undertake this test the special characteristics of securitised real estate IPOs are used. Before the test an introduction to securitised real estate firms and their unique pricing and institutional characteristics are contained in Chapters 4 and 5.

Chapter 2 identified that non-operating companies have insignificant or zero average initial returns. This chapter has discussed the parts of Rock's (1986) model that could

explain non-operating IPO initial returns. For REIT initial returns, the pricing certainty and lack of informed investor participation have been proposed as explanations. One of the objectives of the thesis is investigate the reasons why securitised real estate IPOs have lower initial returns than IPOs of operating firms. Chapter 6 aims to determine whether a real estate pricing uncertainty characteristic can explain the observed low price reactions of securitised real estate IPOs.

In contrast to the numerous initial return models, rational explanations for the long-run underperformance of IPOs are difficult to find. In Chapter 2 the two general possibilities; incorrect estimation of expected returns and market inefficiency were introduced. This chapter has identified cognitive bias as a possible reason for periods of overvaluation. The idea that investors systematically miscalculate the future earnings growth of equity issuers, resulting in overvaluation at the issue date, counters market efficiency; yet is probably the most accepted explanation of underperformance.

Chapter 7 of the thesis tests whether cognitive bias can explain the long-run performance of Property Investment and Property Development IPOs and rights issues. Chapter 2 identified that there has not been a study of the long-run performance of securitised real estate equity issuers, and so this study is a significant contribution to the long-run performance literature. Again, important reasons for examining securitised real estate firms are their unique pricing and institutional characteristics, that are reviewed in the following chapters.

The present chapter has discussed three possible explanations for variations in IPO activity: overvaluation timing, business opportunities, and market imperfections that vary with business conditions. Overvaluation timing is related to the cognitive bias hypothesis but gives firms the ability to determine when equity is overvalued. Empirical findings testing this theory have produced mixed results. A further contribution of Chapter 7 is an examination of implications of the overvaluation timing hypothesis, while testing for cognitive bias in securitised real estate equity issues.

Variation in business opportunities and adverse selection costs have been important factors in previous explanations of SEO timing. However, the existing literature has not provided a theory that explains why firms should time IPOs for adverse selection costs. Possibly the most significant contribution of the thesis is the attempt to explain IPO activity within a rational framework. Chapter 8 develops and tests the explanation that firms observe windows of opportunity to go public. These windows of opportunity result from business conditions where direct issue costs and adverse selection costs are low. The special characteristics of securitised real estate firms are again used to test the theory in Chapter 9.

b. Summary of the issues to be examined in the remainder of the thesis

The objective of Chapters 2 and 3 was to examine the theoretical IPO literature and introduce the particular issues dominating the remainder of the thesis. The remainder of the thesis aims to focus on the following issues which require further empirical analysis and theoretical insight:

The first objective of the thesis is to explain parts of the anomalous first day performance of IPOs. The initial performance literature provides considerable evidence of positive first day returns for operating firms, but securitised real estate IPOs are found to have near-zero initial returns. Attention has focused on the pricing certainty of securitised real estate firms to explain the low initial returns, without providing conclusive supporting evidence. The thesis aims to determine whether there is a real estate pricing characteristic affecting the initial performance of securitised real estate IPOs. Second, despite the importance of the pre-market valuation to the interpretation of initial returns there has been little direct evidence comparing the valuations of IPOs and seasoned firms around the listing date. The thesis aims to test whether IPOs are valued correctly during varying market conditions.

The second objective of the thesis is to reveal firm characteristics underlying the long-run performance anomaly. The recent cognitive bias explanation of long-run underperformance relies on investors overvaluing IPOs at the issue and subsequently realising lower returns than if they had taken a similar position in non-equity issuing firms. The thesis aims to test the cognitive bias hypothesis with a sample of Property Investment and Property Development IPOs and rights issues. This empirical analysis also provides the first examination of the long-run performance of securitised real estate equity issuers and tests whether a real estate pricing characteristic influences long-run performance.

Third, the thesis aims to increase the understanding of inter-temporal variation in IPO activity. The existing literature does not provide either an adequate rational explanation for variations in IPO activity, or a detailed empirical examination of IPO activity. The thesis provides an explanation for hot issue markets based on windows of opportunity caused by adverse selection costs, direct issue costs and business conditions. Several of the empirical implications of the theory are tested in the thesis, and a detailed examination of UK IPO activity is undertaken for the first time.

CHAPTER 4

Institutional Characteristics Of The UK IPO Market[Φ]

1 INTRODUCTION

The institutional characteristics of IPO markets are important to managers of IPO firms because they have the responsibility of navigating the firm through the IPO process. Chapters 2 and 3 have shown that institutional characteristics are also important because they affect IPO performance. For example, average initial returns depend on contract types and the methods of rationing over-subscribed IPOs are determined by contract types and stock exchange regulations.

The objective of this chapter is to explain the regulatory constraints affecting operating and property firms going public in the UK.[45] As the special characteristics of Property Investment companies and Property Development companies are used in several of the empirical chapters later in the thesis, and these firms are subject to special rules on the London Stock Exchange, additional emphasis is placed on the regulatory constraints imposed on these IPOs.

The literature documenting the direct costs of obtaining a public listing is also reviewed in this chapter. Several US and UK studies have concluded that the direct costs of IPOs are greater than those of other financing arrangements and that economies of scale exist in IPO costs. This chapter also presents the first empirical results of the thesis. The direct costs of obtaining a listing for Property Investment and Property Development companies are examined. The sample examined comprises 51 property companies that obtained a listing on the Exchange between

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Φ Parts of this chapter are contained in Gerbich, Levis and Venmore-Rowland (1995). All content and errors are my own.
45 Readers are referred to Loughran, Ritter and Rydqvist (1994) for an appendicized summary of the institutional background of international IPO markets.

August 1981 and December 1994. The results suggest that despite the regulatory requirement for an asset valuation of all property assets, the costs of listing property companies are similar to those of other firms. There is also evidence of economies of scale in the direct issue costs of these IPOs.

The chapter is organised as follows: Section 2 summarises the regulations for obtaining a public listing on the Exchange. Evidence of the direct costs of listing Property Investment and Property Development companies is presented in section 3. Concluding comments are made in section 4.

2 OBTAINING A LISTING ON THE LONDON STOCK EXCHANGE

a. UK IPO markets

The London Stock Exchange [Exchange] is the largest source of external equity finance in the U.K and IPOs comprise a substantial proportion of this funding activity. The Bank of England (1990) reports that during the period 1985-1990 14% of identifiable external company finance was raised by IPOs to the Exchange. The majority of IPOs are by small companies. Of IPOs issued in 1993, 58% had a total market capitalisation less than £50 million.[46]

Any company wishing to list securities on the Exchange needs to comply with the listing rules. The Exchange, as the appointed "Competent Authority" for listing of securities in the United Kingdom under s142 Financial Services Act 1986 (FSA), publishes its listing rules in what is called the Yellow Book (YB). The rules govern admission to listing, the continuing obligations of issuers and the enforcement of those obligations. The rules reflect the European Community Directives and the requirements of the FSA.[47] The listing rules are updated from time to time and the present rules became effective on 1 December 1994.

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46 Hoy (1994).

47 Following European Community Directives implemented in the UK in 1985, the YB was designated as the "listing rules", which later were incorporated into part IV of the FSA.

The Exchange currently has two tiers.[48] The Official List, which in 1995 comprised 2037 domestic equity securities with a combined market capitalisation of £761.4 billion, is the main market. The second market is the Alternate Investment Market (AIM) which began catering for small firms in 1995 after the demise of the Unlisted Securities Market (USM). This chapter examines the listing requirements and methods of listing on the Official List.

Before entering the Official List the Exchange requires the applicant company to fulfil certain basic conditions for listing, relating to the firm itself and the securities for which the application is made. The company must be duly incorporated and be operating within its constitutional documents. The company must have an independent revenue earning business as its main activity and have published or filed, independently audited accounts for the previous three trading years.[49] Continuity of management is a prerequisite to any application.

IPO company accounts must not be more than six months old before the date of listing and must have been reported on by the auditors without qualification. The company must have a confirmation by the Inland Revenue that its tax matters are in order. Directors of the applicant company must be satisfied that the working capital available to the group is sufficient, and may be required to make a statement to that effect. The securities must be freely transferable and have an expected minimum market value of £700,000 (YB 4.16). Finally, an important requirement is that at least 25% of the class of shares being issued must be in public hands following the IPO (YB 4.18).[50]

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48 The Unlisted Securities Market (USM) succeeded to AIM in 1995. The USM was established in 1980 to cater to smaller growing firms and currently has approximately 227 companies with a combined market capitalisation of over £5.7 billion. Popularity of the USM declined steadily since listing rules became more homogenous between the USM and Official List.48 During 1993 for example, there were 180 new companies admitted to the Official List and only 13 new companies on the USM.
49 The Exchange has descretion to allow shorter trading periods (YB 4.4).
50 The Exchange has descretion to relax these last two requirements if satisfied an adequate market will develop for the securities.

b. The sponsor

All IPOs must have a sponsor. The conditions of eligibility for sponsors are set out in YB 2.1 and YB 2.2. A sponsor must be an "Authorised Person" under the FSA and is usually an Exchange member firm. Since December 1993 they may also be professional advisers, such as accountants or solicitors. In any case the sponsor must satisfy the Exchange that it is competent to discharge the responsibilities of a sponsor.

The sponsor undertakes several responsibilities to the Exchange. The sponsor will be the official line of communication with the Exchange, both in lodging the necessary documents and in discussing any matters arising (YB 1.14). The sponsor must satisfy itself that the issuer has complied with all listing requirements, and ensure that the issuer is guided and advised of the listing rules. The sponsor must also ensure that there are no matters other than those disclosed in the listing particulars which the Exchange should consider regarding the suitability of the applicant.[51] Where the Exchange considers a sponsor to be in breach of its responsibilities it may censure the sponsor and/or remove the sponsor from the Exchange register and may publish what action it has taken.

Sponsors that underwrite issues occupy a significant part of the IPO theoretical literature reviewed in Chapter 3. Several theories explaining IPO initial returns reviewed in Chapter 3 reach the implication that firms with a greater uncertainty about their value will be underpriced more than companies where value is less contentious. Following the work of Beatty and Ritter (1986) there has been a number of academic papers examining the importance of underwriter reputation.[52] In the pricing of an issue sponsors have an incentive to ensure the price is consistent with inside information because they do not wish to alienate future clients (by underpricing too much) or investors (by overpricing). A number of authors argue that the need for repeat business gives sponsors a unique certifying role that issuers cannot duplicate.

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51 Sponsors frequently have their own client guidelines for issues in addition to the YB.

52 Underwriters are not the only party involved in an IPO which have reputation capital at stake. There has been interest in the role of ancillary agents and the influences they have on first day returns, for example auditors, venture capitalists and commercial banks have been analysed.

Issuing firms have an incentive to reduce value uncertainty and one method of doing so is to employ sponsors with reputation capital at stake.

Empirical testing of the influence investment banker reputation has on the pricing of IPOs has been confronted by the problem that reputation is essentially an unquantifiable variable. In general a significant inverse relationship between underwriter reputation and initial returns is reported.[53] The most relevant evidence for property company IPOs is the work by Wang, Chan and Gau (1992). Wang, Chan and Gau (1992) report descriptive statistics of US REIT IPO initial day returns partitioned by underwriter. They find that 46% of the 52 REITs in their sample are underwritten by the top 20 underwriters. REITs associated with prestigious underwriters have near zero price reactions on the first day. These results are robust to adoption of the ranking methods introduced by other contributors to this area of research. Furthermore, in their cross-sectional multiple regression analysis, underwriter reputation is found to be the most important factor influencing initial price reactions.

It is apparent that a variety of investment banks have sponsored Property Investment and Property Development company IPOs (hereinafter Property Investment IPOs and Property Development IPOs singularly and PIPOs collectively). The most prolific sponsors of PIPOs over the last decade have been Alexanders/Laing and Cruickshank, Barclays, De Zoete Wedd (BZW), Rowe and Pitman/Warburgs and UBS/Phillips and Drew. Unfortunately no data is available on the advising valuers to PIPOs. The influence that the sponsor's and surveyor's reputation has on initial returns from PIPOs has yet to be examined.

53 For example see. Beatty and Ritter (1986) or Carter and Manaster (1990).

c. The prospectus and the listing process

The prospectus, officially called the listing particulars, is the key document to be published before listing becomes effective. YB chapter 5 sets out the exact standards and type of information required to be included in the prospectus, depending on the securities to be issued, the nature of the issue and the issuer. There are special requirements for the listing particulars relating to certain classes of securities and also certain types of business, such as property or investment companies. Although the Exchange examines draft prospectuses to ensure they comply with at least the minimum standards, the ultimate responsibility for disclosure of information in the prospectus is that of the directors.

On completion of the draft process the issuer must get formal approval from the Exchange before the prospectus can be published and formal notices sent out. YB Chapter 8 sets out the procedure for publication, circulation and advertising of prospectuses. Prospectuses must not be made publicly available until they have been published and if required, advertised.[54] However, draft prospectuses may be circulated without approval for the purposes of arranging a Placing, underwriting or for marketing an Intermediary Offer. The prospectus must be made available at the Company Announcements Office, the issuer's address and the agent of the issuer.

The Exchange requires a number of documents to be submitted over a two week period before the IPO. Copies of the draft prospectus, letters from the sponsor and other documents as listed in YB 7.3 must be submitted to the Exchange, in draft, 14 days before publication. No later than midday two business days prior to the consideration of the application for admission, what are called the 48 hour documents must be presented to the Exchange. These documents include a signed Exchange application form, a signed sponsors and market makers declaration form, and copies of the final listing particulars. Copies of the memorandum and articles of association

54 In Offers For Sale or Subscription a full prospectus or an offer notice must be inserted in at least one national daily newspaper. For other methods a formal notice is required to be advertised in the same manner. An offer notice contains all the elements of a formal notice and an application form. A formal notice is an advertisement complying with the requirements of YB 8.1054.

and accounts of the company are also required. On the day of the consideration for admission, the applicant must pay the (Exchange) charges for listing and, in the case of a Placing or an Intermediary Offer, must make a distribution statement.

After the presentation to the Exchange of the 14 day, 48 hour and on the day documents, the applicant will be considered.[55] Applications for listing are usually considered on Wednesdays and Fridays. The admission of any securities only becomes effective when the decision of the Exchange to admit the securities is announced, usually by electronic dissemination to members. This is the point where the shares of the company may be traded on the Exchange.[56]

After the issue the Exchange requires several other documents. In an Intermediary Offer, the details of the client placees are required. In an Introduction, the opening price of transactions is to be disclosed to the Exchange. The number of securities in fact issued is also to be disclosed.

d. Special requirements for property companies

YB Chapter 18 contains the Exchange's additional requirements for listed property companies. A property company is defined as a company primarily engaged in property activities. Property activities include, the holding of properties or the development of properties for letting and retention as investments, or, the purchase or development of properties for subsequent sale, or both.[57] Property companies are subject to additional disclosure requirements, principally relating to external valuations and valuation certificates. The current revision of the listing rules has had the main effects of rationalising the use of the term "valuation" and making the requirements of disclosure more clear.

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55 The Exchange either before or after the issue may require the issuer to produce additional documents. Agreements to acquire assets, letters, reports and valuations referred to in the prospectus may be requested The issuer must retain such items for seven years so that it may comply with a request by the Exchange.

56 In the early 1980's the Bank of England maintained an informal queuing system whereby IPOs of similar types where spread out over

57 Single property schemes with the meaning as defined in s76(5) of the FSA must also comply with these requirements.

The Exchange requires a valuation certificate to be included in the prospectus for all PIPOs. The contents of the valuation certificate are set out in YB 18.1 and schedule 8. The certificate must give the date of inspection, contain certain details of the property, state the name and qualifications of the valuer and state the effective date of the valuation. The valuation certificate must include a summary of the number of properties and the aggregate of their valuations must be split to show totals defined by tenure, valuation basis and whether in the UK or overseas. Overseas properties must be shown separately in the valuation certificate and the basis of valuation clearly defined (YB 18.5). The net annual rent and the estimated net annual rent (based on current market rental value) must be stated in the valuation certificate (YB 18.16).

Valuations contained in the certificate must be made according to the Royal Institution of Chartered Surveyors [RICS] Statements on Asset Valuation Practices [SAVP]. and the Exchange may withhold its approval of the prospectus if any valuation does not comply. Valuations must be carried out by an external valuer (as defined in SAVP), unless otherwise approved by the Exchange (rare). Any assumptions made and the "Open Market Value" basis of valuation must be clearly defined. Where appropriate a statement is required reconciling the valuation figure with the figure included in the last published accounts.

Where the valuation is in respect of property currently being developed, additional information must be given on the valuation certificate. The open market value of the property in its existing state as at the date of valuation must be stated. The estimated capital values (on the basis of current market conditions) of the development after completion and after completion and letting must also be stated. Additional information must also be provided for property in progressive development or held for future development (YB 18.2 and 18.3).

If the properties held are too numerous, the Exchange may give consent to a condensed format in the listing particulars, however a full valuation certificate must be available for inspection. The Exchange may authorise the omission of any item of information in the valuation certificate if the Exchange considers that disclosure

would be seriously detrimental to the issuer and would not mislead investors. For example, Chelsfield Plc which went public in December 1993 reported a total open market value of properties of £207.8 million. Market valuations for individual properties totalling £124.5 million in value were excluded from the valuation certificate for reasons of commercial sensitivity.

Although reducing the information provided in the prospectus may have some competitive advantages, nondisclosure of property values may result in higher underpricing being required. The probable relationship between the uncertainty of value and initial price reactions suggests that firms should provide as much information to investors as possible, in order to reduce uncertainty and reduce the need for underpricing. Omission of valuation data may lead subscribing investors to unnecessarily mark down the company's share value in the pre-listing negotiations.

e. Method types and issue size

One of the fundamental decisions that the issuer, together with the sponsor, must make is the choice of method to issue the shares. The Exchange limits the choice of method to a few alternatives which have different cost structures and possibly management time implications inherent to them. Thus the firms choice of issue method should be made acknowledging both the existing regulations and the effects of differences in contract mechanisms.

The principle methods used for IPOs and PIPOs are Offers For Sale and Placings. In addition to these contract types Intermediary Offers[58], Introductions[59], Offers For

58 Intermediary Offers are defined in YB 4 16 as a marketing of securities already or not yet in issue, by means of an offer by or on behalf of the issuer to intermediaries for them to allocate to their own clients. An intermediary includes any member of the Exchange and any UK authorised securities house. Allocation to intermediaries should be done according to the YB. The sponsor is expected to announce the result of an intermediaries offer prior to the start of dealings and also submit a completed distribution statement to the Exchange.

59 An Introduction is defined in YB 4.21 as a method of bringing securities to listing not involving an issue of new securities or any marketing of existing securities. The exchange generally allows this method where the securities are already widely held and their marketability when listed can be assumed. Introduction can be an appropriate route for foreign companies.

Subscription[60] and "other" methods are allowed but have specialised uses and are rarely used by property companies.[61]

The method of issue for any IPO in the UK is determined to a substantial extent by the size limits of issue methods set out in YB 4.2. Whatever size of offering, the issuer can make an offer to the public. If the issuer decides on a small IPO, of not more than £25 million, the offer may be made by an Offer For Sale, Offer For Subscription or Intermediary Offer.[62] Issues of this size may also be placed, either in total or in combination with Offers For Sale, Offers For Subscription or Intermediary Offers. If the issue is placed entirely by the sponsoring broker with its own clients there must be at least one (independent) market maker willing to make a market in the shares and at least 5% of the issue should be offered to market makers on the same terms as other participants.[63]

Medium IPOs, of between £25 million and £50 million, may be made by Offers For Sale, Offers For Subscription and Intermediary Offer. Again, they may also be placed, but must be combined with an Offer For Sale, Offer For Subscription or Intermediary Offer. The sponsor may place the lesser of up to 75% of the issue or £25 million. Similar to small IPOs, there must be at least two market makers willing to make a market in the securities and at least 5% of the securities must be offered to them.

The listing regulations have narrowed the major decisions regarding methods of issue down to an Offer For Sale or a Placing for small IPOs, and combined or pure Offers For Sale for medium IPOs. Large IPOs of greater than £50 million must be made by Offer For Sale or Offer For Subscription.

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60 An Offer For Subscription is defined in YB 4 6 as where the company, rather than issuing house, issue an invitation to the public to subscribe for securities of the issuer not yet in issue. The difference between Offers For Sale and subscription is usually a technicality because both issue types are typically underwritten. This method is rare and commonly confined to investment companies.

61 The Bank of England (1990) reports descriptive statistics of the size of the UK IPO market during the period 1985-1990, broken down by issue method. A total of £24 billion was raised over the period, £17 billion of which was Privatisation's and £6 billion Offers For Sale. Less than £400 million were tenders and less than £750 million were Placings. Placings were the most prevalent issue method (50% market share overall and 80% in the final 3 years) despite the relatively small total sum issued. The average size for Placings was reported as £6 million. The average for Offers For Sale was reported to be £60 million, however this statistic was influenced by a number of very large offers.

62 Prior to December 1993 this limit was £15 million.

63 Prior to December 1993 these limits were £15 million and £30 million.

f. The Offer For Sale and Placing methods for going public

An Offer For Sale is defined in YB 4.5 as an invitation to the public by, or on behalf of, a third party to purchase securities of the issuer already in issue. Usually shares are offered to the public at a fixed price by an issuing house on behalf of the company. The issuing house underwrites the entire issue by agreeing to purchase any shares unsold at the end of the offer period. The majority of the risk is typically passed on to sub-underwriters within one day of the underwriter accepting the risk. Sub-underwriters are invited to participate by a broker acting for the underwriter, and are normally large investment institutions.

In Offers For Sale up to 50% of the securities offered may be placed firm and this can be increased at the discretion of the Exchange. No securities can be placed firm with connected clients unless placed with a market maker to make a market.[64] Subscription to an offer does not guarantee that the subscriber will receive an allotment as in many cases there will be over-subscription. Where there is a significant over-subscription it is common for either a scaling of allotted shares or a ballot. The Exchange does allow limited preferential treatment to be given to existing shareholders, directors and employees, however, the basis for allocation must be published for the market and press.

Offers For Sale may be in the form of an invitation to tender at or above a stated minimum price. The Offer For Sale by tender process is designed to ensure that over-subscription is limited. There are two main types of tender: (i) a tender to raise a variable monetary amount with a fixed number of shares on offer, (ii) a tender to raise a fixed monetary amount with a flexible number of shares on offer. It is usual for common price tenders to be adopted rather than true tenders. A single striking price is chosen to ensure that all the issue is sold and that bids at the striking price or above are successful. To ensure a buoyant aftermarket a striking price is set where demand

64 Connected clients includes any client who is a partner, shareholder or employee of the sponsor and certain close relations and trustees.

exceeds the supply of shares and consequently investor's bids for shares are scaled down. The usual underwriting and sub-underwriting agreements are used. This method has been rarely adopted for recent IPOs, however historically tenders have been more popular. For example, in 1983 15 of the 24 Offers For Sale on the Exchange were on a tender basis.[65]

A Placing is defined in YB 4.9 as a marketing of securities already or not yet in issue but not listed, to specified persons or clients of the sponsor, which does not involve an offer to the public or to existing holders. It is a significant change (post December 1993) that Placings are no longer deemed to be a concessionary method and therefore no special permission from the Exchange is required. A Placing of initial equity shares must have at least 100 placees, and the total number of shares allocated to existing shareholders and employees must be disclosed. No initial Placing may be made to connected clients unless to market makers for the purpose of its business as such.

The Placing is underwritten by the issuing house for a short period, but the main function of the issuing house is not to bear risk but to distribute the shares. The issuing house typically purchases the entire issue from the company subject to listing, and places most of the shares with investors, sometimes using a broker to find the investors. No sub-underwriting is carried out by investing institutions in this method. The Placing of shares takes place on the day of the signing of the Placing agreement, usually five business days before the shares start trading.

A distinct trend in the IPO market is the growing prevalence of Placings as regulations restricting the size of Placings have been loosened. The Bank of England (1990) results suggest that this has been associated with a increase in average direct costs (including underwriting fees, 10.9% of gross proceeds in 1986 and 14.9% in 1989). It remains to be seen if the recent extension of the maximum size of Placings to £25 million will further increase the prevalence of Placings and influence costs. Consistent with the general IPO trend, Placings have become increasingly popular

65 Bank of England (1990)

with property companies since the "big bang" and subsequent loosening of listing regulations. The number of Placings in the sample is 36 whilst Offers For Sale number 15 (see Table 4.1). Before the Pillar Plc issue in August 1994 the last Offer For Sale PIPO included in the sample is the Broadwell Land Plc PIPO in July 1988. In between these two PIPOs are 12 Placings.

3 COSTS OF PROPERTY INVESTMENT AND DEVELOPMENT IPO

a. Direct cost items and economies of scale

The direct costs of IPOs appear to be greater than other financing options available to firms. Lee, Lochhead, Ritter and Zhao (1995) report that direct costs of going public in the US average 11.0% of the proceeds. They find IPOs far more costly than seasoned equity offerings (7.1%), convertible bonds (3.8%) or straight bonds (2.2%).[66]

The main direct costs incurred by the normal issuer are (i) underwriting commissions, (ii) fees of the sponsor, (iii) broker fees, (iv) legal fees, (v) accounting fees, (vi) advertising costs (vii) printing costs, (iix) public relations costs, and (ix) Stamp Duty Reserve Tax. In addition property companies incur the cost of an independent market valuation of the property portfolio. Valuation costs can be substantial, especially if the portfolio contains a large number of individual properties spread over a wide geographical area. The company's total costs of issue, including the underwriting commissions are disclosed in the prospectus. Some detailed information of the various other costs may also be published. A conservative example of the issue costs for a £50 million PIPO with a portfolio value in excess of £150 million is presented in Table 4.1.[67]

66 Ritter (1987) estimates that the direct costs (primarily fees to investment bankers and advisers) and indirect costs (underpricing) of going public in the US are 21.2% of the realised issue value of a Firm Commitment offer and 31.8% for Best Efforts contracts.

67 The costs in Table 4.1 are based on information revealed in telephone interviews with corporate finance practitioners. Practitioners stressed the highly variable nature of cost items depending on the complexity of the issue and the importance of economies of scale in determining total costs

Previous studies have shown that economies of scale exist in IPO issue costs. It is important in deciding the size of the issue to establish which direct costs are fixed and which vary with size. A large portion of the costs of going public are fixed, for example the legal fees and accountants fees associated with the issue are determined by the complexity of the issue not its size. Evidence reported by Ritter (1987), Bank of England (1990) and Lee, Lochhead, Ritter and Zhao (1995) suggests that there are significant economies of scale in issue costs in the UK and US. The Bank of England (1990) find that the percentage costs of both Offers For Sale and Placings decline as the size of issue increase. For example, The Bank of England (1990) report Placings of less than £5m incur direct costs that average 11.5% while issues between £5m and £10m cost on average 7.5%. Ritter (1987) estimates the direct costs of going public are equal to 1982$250,000 plus 7% of the issue size.

Another significant determinant of issue costs is the contract method. For example a Placing does not require distribution of application forms and prospectuses to the public, so these costs increase the relative cost of offers. There have been several US and UK studies investigating the direct costs associated with differing contract types.[68] The Bank of England (1990) reports that during the period 1985 to 1990 the average direct cost of an IPO varied between 8% and 10% of the gross proceeds. Other statistics reported by the Bank of England suggest that a decrease in direct costs (as a percentage of proceeds) for Offers For Sale has occurred over time, whilst the cost of Placings has fluctuated.

The remuneration of financial institutions associated with the issue is the single largest group of expenses incurred by the issuer. These costs are usually directly related to size and vary with the method used. The sponsor of the issue usually charges the standard fee of 2% of the amount raised, and may charge an additional consulting fee. Out of this commission the sponsor pays the broker and sub-underwriters. The broker to the issue is usually paid 0.25% for arranging the sub-underwriting and the investing institutions which sub-underwrite the issue normally

receive 1.25%.[69] Placings are saved the 1.25% sub-underwriting fee. A significant cost which is based on the size of the issue is Stamp Duty Reserve Tax. This is currently up to 1% of the amount raised by the issue of new shares.

Table 4.1Typical issue costs for a £50 million Property Investment Offer For Sale

Major Costs	£
Underwriting commissions	1,050,000
Consulting fees of the sponsor	365,000
Broker fees	195,000
Legal fees	235,000
Accounting fees	185,000
Advertising costs	395,000
Printing costs	145,000
Stamp duty reserve tax	300,000
Valuation fee	175,000
Public relations	125,000
Total	£3,170,000
% of issue size	6.34%

b. Average direct costs of Property Investment and Development IPOs

As property companies are required to report a comprehensive valuation of their assets in the listing particulars, the role of advisers and therefore direct costs of a PIPO may differ from other IPOs. This section examines the direct costs of 51 property companies that obtained a listing on the Exchange during the period from August 1981 to December 1994. All companies were raising equity for the first time by Offers For Sale or Placing and seeking a contemporaneous public listing in the property sector of the Exchange. Data were derived from the KPMG New Issue

68 For example, see Ritter (1987) and Welch (1991).
69 Sponsors and other advisers must be remunerated in cash except for certain circumstances where an adviser to an applicant can be remunerated by options or warrants (YB 4.30). Full disclosure of the non-cash payments must be made in the listing particulars

Statistics and from summaries of the individual offer prospectuses published by Extel Financial Ltd.

The descriptive statistics of the equally weighted average direct costs of PIPOs in Table 4.2 have been calculated from KPMG new issue statistics. Direct costs are defined as the difference between net and gross proceeds of the issue reported in the prospectus. The average direct cost for all PIPOs in the sample is 9.37% of the amount raised, or £793,000.[70] This is within the range reported by the Bank of England (1990) for all IPOs, which suggests that the costs of PIPOs are not different to other IPOs.

Placings are the most popular issue method for property companies. Placings are on average smaller than Offers For Sale (average proceeds £7,499,000 compared to £25,954,000) and cost more in percentage terms (2.54% difference). Placings appear far less expensive than Offers For Sale in cash terms (£856,000 difference), but this is caused by the greater amounts raised in Offers For Sale. The results suggest the popularity of Placings derives from the lower nominal costs of this method and that economies of scale exist in PIPO costs.

Table 4.2 Direct costs of Property Investment and Development IPOs

	All PIPOs	Placing	Offer For Sale
Mean of Cost/Gross Proceeds	9.37%	10.11%	7.57%
Mean Cost	£793,000	£541,000	£1,397,000
Mean Gross Proceeds	£12,927,000	£7,499,000	£25,954,000
Sample	51	36	15

70 All monetary amounts are represented in January 1995 pounds according to the R.P.I. inflator.

4 CONCLUSION

The first objective of this chapter was to examine the regulatory constraints affecting operating and property firms going public in the UK. This review summarises: the basic conditions for listing, the vital role of the sponsor, the importance of the prospectus in the listing process and the contract choice firms must make. These institutional restrictions affect PIPOs and IPOs equally without even minor differences in the regulations.

The main difference between listing a Property Investment or Property Development company and a non-properly company is the portfolio valuation requirement. The Exchange requires a valuation certificate in the prospectus for all PIPOs. The valuation certificate must include a summary of the number of properties and the aggregate of their valuations must be split to show totals defined by tenure, valuation basis and whether in the UK or overseas. Importantly, valuations contained in the certificate must be made according to the RICS SAVP by an external valuer. Any assumptions made and the "Open Market Value" basis of valuation must be clearly defined. Besides value details, PIPOs must also report the net annual rent and the estimated net annual rent (based on current market rental value), in the valuation certificate.

Despite the requirement for valuations from independent valuers the direct costs of PIPOs are similar to those of operating companies. The first empirical findings of the thesis suggest going public is a costly financial event for a property company to undertake and the utility gained from a listing must be substantial to outweigh these costs. It would not be unusual for total direct costs to be over 9% of a PIPO's gross proceeds.

The choice of method to issue a PIPO is narrowed down in practice to either Placings or Offers For Sale. It appears that direct costs are sensitive to both contract type and

the size of issue. Previous literature suggests that there are economies of scale in issue costs and the direct costs of PIPOs appear to be consistent with this.

This chapter has established two important concepts used in the empirical chapters of the thesis that follow. First, Chapter 6 discuses how the provision of detailed information regarding the underlying portfolio of a Property Investment company in the listing particulars facilitates the pricing of these shares based on asset value. Second, the importance of direct issue costs and the availability of economies of scale to the firm form one of the windows of opportunity hypotheses in Chapter 7.

CHAPTER 5

The Unique Pricing Of Securitized Real Estate IPOs[Φ]

1 INTRODUCTION

Securitised real estate firms exist to allow funds to flow between investors and real estate portfolios. There are many varieties of securitised real estate firms in international capital markets. For example, in Australia securitised real estate firms exist as Australian Listed Property Trusts (ALPTs). Securitised real estate firms in the US are predominantly Real Estate Investment Trusts (REITs), real estate companies or Master Limited Partnerships (MLPs). In the UK securitised real estate firms are property companies.

Securitised real estate IPOs have recently formed a significant part of IPO activity. In the US during 1993 for example, Equity REIT IPOs raised $9.1 billion in 47 issues, constituting 21.9% of funds raised from all US IPOs.[71] ALPT IPOs raised Aus$1.0 billion during the year prior to the third quarter of 1994.[72] The Limburg Institute of Financial Economics Global Real Estate Securities Indices report that the total market capitalisation of world securitised real estate markets increased from US$12 billion to US$95 billion between 1984 and 1994. This growth originates from increases in the size of existing firms and an increase in the number of new firms.

Despite the growth in securitised real estate markets over recent years securitised real estate IPOs remain unresearched outside the US. Chapter 2 showed that there has been no evidence of the initial performance of securitised real estate IPOs outside the US to verify the aberrant findings of Wang, Chang and Gau (1992) and others. Moreover, no evidence of the long-run performance of securitised real estate equity

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Φ Parts of this chapter are contained in Gerbich, Levis and Venmore-Rowland (1996). All content and errors are my own.
71 Lehman Bros (1994)
72 Property Investment Research Ltd (1995)

issuers, in any market, has been published to determine whether new issue underperformance is exhibited in securitised real estate markets. Securitised real estate firms have provided considerable insight into other corporate finance decisions and we shall see that the unique characteristics of these firms can be used to gain insight into the IPO anomalies.

The objectives of this chapter are twofold. First, to introduce securitised real estate firms and the literature concerning these special equities. Second, to establish the unique pricing characteristics of securitised real estate IPOs in the UK.

Recently the pricing of securitised real estate firms has drawn attention in the IPO literature. Below, Zaman and McIntosh (1995) and Ling and Ryngaert (1995) argue that US REITs have lower pricing uncertainty than other IPOs because the real estate assets these firms own are more easily valued than the assets of operating companies. They conclude that the evidence of insignificant initial returns for REIT IPOs (reviewed in Chapter 2) are consistent with REITs having low pricing uncertainty.

The focus of this chapter is the pricing of Property Investment company IPOs. Property Investment companies are the only securitised real estate firms in the UK. They have relatively stable earnings from contract rents and are valued based on their real estate portfolios. These traits contrast Property Development companies, which typically have volatile earnings, little asset backing, and are valued using cash flow techniques. Moreover, Chapter 4 identified that Property Investment and Property Development companies are required by the London Stock Exchange to report a valuation certificate in IPO listing particulars. This information enables analysts and investors to value Property Investment company IPOs on a net asset value basis. This chapter hypothesises that Property Investment company IPOs will have lower pricing uncertainty than Property Development company IPOs because of their stable rental income and unique net asset value pricing basis.

The chapter is organised as follows: Section 2 introduces the literature concerning securitised real estate firms. In section 3 the pricing of Property Investment company IPOs is examined. Concluding comments are made in section 4.

2 SECURITIZED REAL ESTATE LITERATURE

a. Defining securitised real estate firms

Securitised real estate firms are publicly traded legal entities that exist as financial intermediaries to allow funds to flow between investors and real estate portfolios. There are two broad types of securitised real estate firms in international capital markets: (i) passive firms, and (ii) active firms.

A passive firm will hold a portfolio of property investments and act as a landlord. Passive firms do not undertake substantial gearing, development activity or other entrepreneurial activities. The earnings and cash flow of a passive firm are determined by the income (rents) and expenses (outgoings) of a real estate portfolio. Rental income is derived from lease contracts with building occupiers. Leases are usually for a fixed term with regular rent reviews and therefore provide a relatively stable income stream. The largest passive securitised real estate market is the US REIT market. REITs must comply with regulations designed to ensure they are a passive investment.[73] Special institutional treatment can benefit investors if REIT regulations are met; namely lower taxation.

Active firms are the second type of securitised real estate entities. Active firms own real estate portfolios but may also develop and manage other projects. Active firms face little restriction of trading and development activity, dividend policy or shareholder weightings. The earnings of passive firms are the composite of contract rents and other income of a more variable nature. Although they enjoy more

73 REITs must comply with income payout restrictions, income source restrictions, shareholder weightings, and management activity restrictions to qualify for special income tax treatment. For a review of the institutional characteristics of REITs see Corgel, McIntosh and Ott (1995).

operational flexibility than passive firms, active firms typically do not enjoy special institutional treatment (such as tax-breaks).

Excluded from the definition of securitised real estate firms are real estate development companies. Development companies do not hold real estate portfolios; rather they own few assets and generate profit from undertaking risky projects in the same way as other operating companies. A development company's primary business activity is the development, redevelopment, or refurbishment of real estate, for subsequent sale. The earnings of development companies are influenced by real estate market conditions but are not comprised mainly of contract rents and are generally more volatile than the earnings of securitised real estate firms. Development companies do not act as intermediaries but solely as entrepreneurs and cannot be viewed as securitised real estate firms.

In the UK, investors seeking securitised real estate investments have only listed property company shares. The combined market capitalisation of all property companies varies around 2% of the FT All share market value.[74] As at the end of 1995 the combined market capitalisation of the 135 UK listed property companies was approximately £15 billion. Property companies are either active securitised real estate firms or development companies.

The majority of property companies hold real estate portfolios and are categorised as active securitised real estate firms. These companies are known as Property Investment companies. Essentially Property Investment companies are landlords whose primary business activity is the ownership of real estate for contract rental income and capital appreciation. Property Investment companies may also undertake development activity from time to time and can be highly geared. Property Investment company IPOs will be referred to hereinafter as Property Investment IPOs.

The remaining property companies in the UK have the primary business activity of the development, refurbishment or purchase of real estate for subsequent sale.

Collectively these developers and traders can be categorised as Property Development companies and are not defined as securitised real estate firms. These companies have volatile earnings dependent on the success of capital and time intensive real estate projects. The cash flows of Property Development companies are often very uncertain and tend to be either high or low depending on the timing of projects. Property Development companies are valued using cash flow and comparable multiple approaches only, in the same way as other operational companies. The difficulty in assessing the value of Property Development companies by reference to underlying asset value is often the reason practitioners present for undertaking price-earnings and cash flow valuations of these firms [Adams and Venmore-Rowland (1989)]. Property Development company IPOs will be referred to hereinafter as Property Development IPOs.

b. Why securitised real estate firms are special

The literature examining securitised real estate firms divides into studies of investment and financing issues.[75] Investment issues include: the nature of securitised real estate equities as an asset class, acquisitions and disposals of real estate, performance and anomalies, risk and diversification, and returns and hedging. The financing literature of securitised real estate firms comprises topics such as dividend policy, capital structure, agency costs, capital budgeting and IPOs. Although the majority of research concerning securitised real estate firms has been US based, international contributions are increasing.

Securitised real estate firms have attracted special research interest because they have unique characteristics and their shares behave differently to other stocks. Many of the differences between securitised real estate firms and other companies are institutional in nature. Institutional differences typically relate to: distinguishable taxation treatment, shareholder weighting limits, dividend payout restrictions and periodic portfolio valuation requirements. The special constraints placed on property

74 Lizieri and Satchell (1994) report the weight of the sector varies around 2% over the period 1980-1995
75 For a review of the securitised real estate financial economics literature see Corgel, McIntosh and Ott (1995).

companies by the London Stock Exchange that were discussed in Chapter 4 are examples of the distinct institutional treatment afforded to securitised real estate firms.

Because of their unique institutional characteristics, securitised real estate firms have been used as a special case to gain insight into financial questions. For example, the tax transparency of REITs is used by Howe and Shilling (1988) to examine reactions to security issue announcements. They find a significant positive response to REIT debt offering announcements while the market responds indifferently to debt announcements of operating firms. Allan and Sirmans (1987) use the 75% passive income requirement for REITs to examine merger and acquisition hypotheses. They find that acquiring REITs experience significant wealth increases, while acquiring operational firms do not.

Apart from institutional differences, there is a fundamental difference between real estate shares and other equities that is of particular use to this thesis. Securitised real estate firms hold portfolios of real estate and therefore real estate equities represent, at least partially, an investment in real estate. In the long-run, if securitized real estate prices deviate from direct real estate prices there will be arbitrage opportunities. When arbitrage opportunities arise market participants will buy the cheap asset and sell the expensive asset, causing price pressure down on the expensive asset and up on the cheap asset. Thus, while short term price deviations might be expected between securitized and direct real estate, in the long run they will drift together.

Several attempts have been made to establish the relationship between securitised and direct real estate prices. Most of the studies undertake time series cointegration analyses using REIT price data. UK and international studies have been carried out by Eichholtz (1994), Barkham and Geltner (1993), Lizieri and Satchell (1994) and Eng (1995). Corgel, McIntosh and Ott (1995) present a comprehensive review of the REIT literature examining the relationship between securitised and direct real estate

prices. Overall, they conclude securitised and direct real estate have a strong common component which represents real estate fundamentals.[76]

Evidence supporting the fundamental link between securitised and direct real estate comes from the information content of portfolio valuations. Taking a different approach to the securitised and direct real estate price studies, Damodoran and Liu (1993) investigate whether portfolio valuations convey information to real estate security prices. They posit that there are similarities between the real estate valuers hired by securitized real estate firms and the analysts that follow other equities. Both analysts and valuers possess some private information and use comparable evidence in estimating the present value of the firm. Both are independent parties.[77] Damodoran and Liu (1993) argue that valuations convey more private information than analyst's recommendations because valuers have access to more client privileged information. They find that portfolio valuations provide information which insiders trade on before publication. Insiders buy (sell) after they receive favourable (unfavourable) valuation news; causing abnormal returns during the appraisal period. This evidence suggests that portfolio valuations contain information important to real estate security prices.

In sum securitised real estate firms are different because of institutional and fundamental characteristics. These differences cause real estate securities to behave differently to the shares of operating firms. The next section discusses how the fundamental link between the share price and the portfolio value of a securitised real estate firm is the basis of pricing securitised real estate IPOs in the UK.

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76 Some studies have disputed the fundamental relationship between securitised and direct real estate. See for example Eng (1995).

77 Damodoran and Liu (1993) note that there are important differences between a valuer's estimate of value and an analyst's recommendation. The first difference is that analyst recommendations are timed independent of the firm, whilst valuations are made at the discretion of the firm. Consequently firms may attempt to time valuations for when it is likely they will get a positive appraisal. Secondly, analysts can make recommendations without any contact or approval from the firm, whilst valuers are selected and remunerated directly by the firm. Thus, there is a potential bias of firms selecting valuers more likely to provide favourable valuations. While the same criticism could be said of analysts, the selection process accentuates the problem for valuers.

3 THE PRICING OF SECURITISED REAL ESTATE IPOS IN THE UK

a. Firm valuation methods

Firm valuations are required in a variety of situations where market values do not exist. For example, valuations are required for venture capital financing, management buy-outs, leveraged buy-outs, and determination of offer prices for IPOs. In accordance with the importance of firm valuation in practice a large theoretical valuation literature exists. Three valuation methods are most popular: (i) the comparable firms approach, (ii) the discounted cash flow [DCF] approach, and (iii) the asset value approach. While not intending to be a comprehensive review of these approaches, this section describes their implementation.[78]

Of the alternative valuation methods the comparable firms approach is often the most referred to by practitioners.[79] The comparable firms approach is implemented by capitalising a performance measure of the subject firm by the mean or median value multiple of comparable listed firms. For example, in equation [1] the earnings before interest and taxes [EBIT] is capitalised by the price-earnings ratio [P/E]. Other measures of performance such as sales and operating earnings can be used in conjunction with the price-sales ratio and price-operating earnings ratio.

$$\text{Firm Value} = \text{EBIT} * \text{P/E} \qquad [1]$$

Valuation by comparable firms relies on the assumption that comparable firms have expected future cash flows that grow at the same rate and have the same risk as the firm being valued. It is also assumed that the value of the company will vary in direct proportion to the operating performance measure. In practice there is not likely to be an exact match of cash flows between comparable firms and the firm to be valued.

78 For a review of valuation models see Atiase and Tse (1986).
79 Discussions of the comparable firms approach in valuations such as IPOs are included in Buck (1990) and Kaplan and Ruback (1995).

There is also confusion as to which operating measure; EBIT, sales, or operating earnings, is most appropriate to be used in valuations.

Several studies of the comparable firm approach have been undertaken in the valuation literature. Boatsman and Baskin (1981) find that the accuracy of P/E valuations using firms from the same industry is lower than if firms from the same industry with similar growth in past earnings are used. Alford (1992) attempts to determine whether selecting firms on the basis of industry, size, earnings growth and leverage impacts on valuation accuracy. He finds that being overly selective on the basis of industry and leverage decreases valuation accuracy.

The DCF approach is the most explicit valuation method. The DCF approach can be implemented in a variety of ways. The most common approach is to compute the discounted value of free cash flow [FCF] out to a horizon and add the present value of the forecasted terminal value of the business [T] at the horizon.[80]

$$\text{Firm Value} = \sum_{y=1}^{h} \frac{FCF_Y}{(1+r)^y} + \frac{T}{(1+r)^h} \qquad [2]$$

Free cash flow can be calculated in a number of ways, usually starting from net income and adding; depreciation, after tax asset sales, and interest; and deducting; changes in working capital, and capital expenditure. The terminal value is often computed by capitalising the horizon year FCF in perpetuity by a constant growth capitalisation rate. Asset pricing models such as CAPM and the Arbitrage Pricing Theory can be used to determine the appropriate discount rate [r]. The impact of leverage on the firm value can be incorporated using the weighted average cost of capital [WACC] or the adjusted present value [APV] methods. For IPO valuations firms in the same industry are often used to determine risk measures such as CAPM beta.

80 Kaplan and Ruback (1996) provide an excellent discussion of DCF valuation methodology.

The DCF method relies on the accuracy of the cash flow projections and risk measures. As there is likely to be wide opinions on the methodology for calculating discount rates and future cash flow growth, many practitioners argue that DCF valuations can be used to justify any value. There have been few tests of the accuracy of the DCF method relative to the comparable firms method.

Kaplan and Ruback (1995) analyse the relationship between price and DCF valuations for management buyouts and recapitalisations of large mature firms. They show that 47% of their CAPM based discounted cash flow valuations are within 15% of transactions prices. 58% of their comparable firm valuations are within 15% of transaction prices if recent transactions from the same industry are used. However given that firms going public are usually young growth firms they are probably associated with less accurate valuations than the management buyout and recapitalisation firms in Kaplan and Ruback's (1995) sample.[81]

Despite the importance of the pre-market valuation there has been little direct evidence of the relationship between valuations and prices in the IPO literature. In a recent exception Kim and Ritter (1996) analyse the relation between offer prices and accounting data used in the valuation of operational and biotech IPOs. They find the cross-sectional variation in operational IPO offer prices bears only a slight relation to variations in cash flow and comparable firm valuation variables such as earnings per share and the price-book value ratio. Kim and Ritter (1996) conclude that the cross-sectional variation in offer prices is unable to be explained by valuation variables. They contend that because young firms in the same industry display large variations in price-earnings ratios and price-book ratios, any offer price can be justified.[82]

Applying the comparable firms and DCF methods to Property Investment and Property Development IPOs is likely to result in lower valuation errors for Property Investment IPOs. Both the comparable firm and DCF methods rely on earnings and

81 For a sample of eight IPOs Kaplan and Ruback (1996) do find more uncertain valuations. However the size of the sample does not allow confident conclusions to be made

82 More explanatory power is found for the cross-section of biotech IPO prices, especially if special industry factors such as the number of scientists are included in the regressions.

growth in earnings to assess value. The relatively stable rent income of Property Investment IPOs should be easier to forecast than the lumpy project profits of Property Development IPOs. Thus one of the main components in both conventional valuation approaches is more certain for Property Investment IPOs than for Property Development IPOs. The asset value approach used for Property Investment IPOs gives even more reason for valuation errors to be lower for Property Investment IPOs compared to Property Development IPOs.

The third firm valuation approach is to use asset based methods. Typically little regard is taken of the value of assets in IPO valuations. This is because the market price of assets are not reported in the accounts, and in any case, the assets alone do not represent the cash flow generating ability of the firm. Kim and Ritter (1996) argue that the asset value approach is only relevant when a significant portion of the assets of the firm can be liquidated at well determined market prices.

Securitised real estate IPOs have assets with determinable asset values that can be liquidated in the direct real estate market. Thus securitised real estate IPOs are one of the few types of IPOs that can be valued using all three approaches: asset value, comparable firm and DCF. Although comparable firm and DCF valuations are undertaken for securitised real estate IPOs, asset valuation approaches are established in the UK as the most appropriate method for the valuation of Property Investment company shares. The process of valuing Property Investment IPOs using the adjusted net asset value [adjusted NAV] method is the subject of the subsequent sections of this chapter.

b. Valuation of the real estate portfolio in the prospectus

The valuation of the property portfolio is the starting point for the pricing of Property Investment IPOs by adjusted NAV. Damodoran and Liu (1993) have brought considerable attention to the practise of securitised real estate firms to hire advisers to periodically estimate the current value of their real estate portfolio. For UK

securitised real estate IPOs disclosure of the value of real estate holdings is not an optional practice, but a regulatory requirement to listing.

Chapter 4 summarised the special regulations of the London Stock Exchange for property companies. The Exchange requires that a valuation certificate is reported in the prospectus of all property company IPOs. The valuation certificate must: (i) provide a summary of the number of properties and their valuations, (ii) show aggregate portfolio value split by tenure, valuation basis and location. (iii) report the net annual rent and the estimated net annual rent (based on current market rental value) from the portfolio. (iv) only include valuations made in accordance with the Royal Institution of Chartered Surveyors [RICS] Statements on Asset Valuation Practices [SAVP].

SAVP (20) and (4) require that investment properties be valued on an Open Market Value basis. SAVP 2 defines Open Market Value as: "the best price at which an interest in the property might reasonably be expected to be sold at the date of the valuation assuming..": (a) a willing seller, (b) a reasonable period in which to negotiate the sale taking into account the nature of the property and the state of the market, (c) that values remain static during that period, (d) that the property will be freely exposed to the open market, and (e) that no account will be taken of any additional bid by a purchaser with a special interest.

To estimate the Open Market Value of the property portfolio, the valuer hired by the firm will undertake individual valuations of the properties using discounted cash flow, initial yield, term and reversion, and direct sales comparison approaches.[83] Under simplifying assumptions the value of a freehold property can be described by the present value model of Adams, Booth and Venmore-Rowland (1993).

$$V_a = \frac{R_1 a_n^{4}}{1-\left[\frac{(1+g)}{(1+i)}\right]^{n}} - \sum_{z=1}^{\infty} \frac{C_{tz}(1+f)^{tz}}{(1+i)^{tz}} \qquad [3]$$

83 For an examination of real estate valuation methodologies in the UK see Brown (1991) or French and Ward (1996).

Where: V_a is the value of a real estate asset, R_1 is the initial market rental income net of tax and other annual outgoings, n is the rent review period in years, g is the expected growth in open market rental (rents increase by $(1+g)^n$ at each review), a_n^4 is the present value of an annuity of £1pa (paid quarterly in advance for n years using i), i is investors net of tax required real rate of return, C_{tz} are the non-annual out-goings estimated at times t, f is the estimated building cost inflation rate.

From the model of Adams, Booth and Venmore-Rowland (1993) it can be seen that the value of a real estate asset is the present value of net rental income less the present value of non-annual outgoings. An increase in expected rental growth, market rents or a decrease in the required rate of return increases the value of a real estate asset.

While the methodologies adopted by valuers vary between markets and property types, most valuers rely primarily on initial yield approaches for the valuation of investment properties. In this method the before tax market rental [R] is capitalised in perpetuity by an initial yield [y] that includes all adjustment for non-annual outgoings and growth in rents.

$$V_a = \frac{R}{y} \qquad [4]$$

In the usual capitalisation of income method of real estate valuation the valuer first estimates the net before tax cash flow from the property. This estimate is based on recent and historically agreed leases for similar properties in the locality. The evidence used is often private to the original parties and a few valuer companies.[84] Furthermore, only partial information of varying accuracy and timeliness may be known. Having determined a cash flow, the second step is to divide the cash flow by the initial yield, also called the capitalisation rate. The capitalisation rate adopted is estimated from the valuer's private records of transactions; that may also be

84 The availability of transaction information varies between countries. In the UK sales and rental transactions are not publicly disclosed. In New Zealand and Australia sales are publicly disclosed but rental information is private. In the US disclosure is required for sales in only a few states.

incomplete and historic. The valuer analyses initial yields of comparable properties and makes adjustments based primarily on her experience in the market. Adjustments can be for a variety of reasons with often very little quantitative analysis to back up their validity. Importantly, both stages in the usual valuation method of appraising present value rely on historical evidence from comparable properties.

The figure resulting from the valuer's calculations is the estimated present value of the property. The value of the firm's portfolio [Vp_t] is the sum of the **x** individual property valuations.

$$Vp_t = \sum_{a=1}^{x} V_a \qquad [5]$$

Because valuers estimate valuation parameters from incomplete historical information there will always be some error between valuations and prices. Empirical studies of the relationship between valuations and prices provide results suggesting the accuracy of valuations may differ considerably between samples and over time. Matysiak and Wang (1995) provide evidence of valuation errors from a sample of 317 UK sale/valuations over the period 1973-1991. They find that the probability of the selling price of a real estate asset being within +/- 10% of a valuation is only 30%. Drivers Jonas and IPD (1995) report that for a sample of 2840 transactions over the period 1982-1993, 42.1% of valuations were within +/- 10% of the sale price and 65.8% were within +/- 20%.

There has been no published evidence documenting valuation errors of real estate portfolios but, due to diversification, valuation errors should be very small in relation to the total value. As long as valuation errors are random, the size of individual properties reasonably homogenous and the number of properties large, errors will cancel out in the portfolio value. This is a major difference between the valuation of a Property Investment IPO and the valuation of an operating firm IPO. For Property Investment IPOs the error in valuation is diversified down to the error on a few properties.

For example a portfolio of 101 £1 million properties would be expected to have valuation error of say 10% of the value of one property. Thus the expected error is $\frac{£100,000}{£101,000,000}$ or 0.099% of the portfolio value. This level of error is very low compared to the measures of accuracy found for comparable firm and DCF valuation approaches. Thus the intrinsic value of a Property Investment IPO appears considerably easier to estimate accurately than the intrinsic value of an operating company IPO. However there are some complications which should be taken into account.

c. Net asset value calculation

Deduction of liabilities from the portfolio value produces the net asset value [NAV] of a Property Investment company. NAV is an estimate of the liquidation value of equity in the firm and is established in the UK as the most appropriate measure for the valuation of Property Investment company shares. Fraser (1984), Adams and Venmore-Rowland (1989), Brett (1990) and Leming (1990) suggest that as current market real estate valuations are based on the present value model, assuming value additivity holds, NAVs represent the discounted value of future cash flows to equity holders. Valuing Property Investment companies with reference to their underlying NAV is merely another form of cash flow valuation.

Where $\mathbf{d_t}$ is the aggregate market value of the liabilities of the Property Investment company at time **t**, the NAV at time **t** is calculated as the real estate portfolio value (Vp_t) less the total value of liabilities.

$$NAV_t = Vp_t - d_t \qquad [6]$$

Where the firm has **n** shares the NAV per share [$\mathbf{NAVps_t}$] is simply the NAV divided by **n**.[85]

$$NAVps_t = NAV_t / n \qquad [7]$$

NAVs on their own are not used for pricing Property Investment company IPOs or making trading recommendations on seasoned Property Investment companies. This is because Property Investment company share prices tend to deviate from NAV per share. Property Investment company shares usually trade at a discount to NAV [DNAV] which varies considerably across firms and over time.

The SBCWarburgs monthly estimated sector average discount to NAV [Warburgs SDNAV] over the period January 1978 to December 1995 has a mean of 23%.[86] The Warburgs SDNAV varies considerably over time and an average premium to NAV has occurred in two brief periods over the last 17 years. Leming (1990) presents the estimated DNAVs recorded by SBCWarburgs analysts for 31 Property Investment companies at the beginning of 1990. The mean DNAV of the companies was 29.4%, with a minimum of 16.7% and a maximum of 75.9%.

A seasoned Property Investment company's DNAV is calculated from the ratio of the market value of shares to the value of the portfolio. Where the firm has **n** shares and a share price of $\mathbf{s_t}$, the DNAV at time t is represented in equation [8].

$$DNAV_t = 1 - \frac{s_t n}{Vp_t - d_t} \qquad [8]$$

Why Property Investment company share prices deviate from NAV has received little theoretical or empirical attention.[87] Adams and Venmore-Rowland (1989) and

85 Adams and Venmore-Rowland (1989) give a brief review of the calculation of fully diluted NAV. Fully diluted means that the NAV is adjusted on the assumption that any options are taken up and convertible securities are converted into equity. In this chapter it is assumed for simplicity that only ordinary shares exist.

86 Discounts are referred to with positive values and premiums with negatives

87 Long-term average DNAVs are difficult to reconcile with the arbitrage pricing principle. The average DNAV suggests that securitised and direct real estate prices are distinguishable in the long-run and there are opportunities for arbitrage. Because the DNAV persists it appears that an equilibrium relationship is being maintained.

Leming (1990) present possible factors causing discounts, many of which originate from the investment trust literature.[88] Like Property Investment companies, investment trusts are valued to their underlying investment portfolios and trade at an average DNAV that varies cross-sectionally and over time.[89] Theories to explain the presence and variation of DNAVs incorporate either investor sentiment or rational variations in agency costs, liquidity or taxation liabilities.[90]

Agency costs could create discounts for Property Investment company shares if management costs are high or if investors expect poor portfolio management [Boudreaux (1973)].[91] The restricted stock hypothesis suggests that Property Investment companies hold unsaleble assets, such as incomplete developments, and their valuation over-states current NAV. The block discount argument suggests that as Property Investment companies hold large numbers of assets requiring considerable marketing effort, time, and transactions cost to sell, the realisable proceeds from a liquidation are likely to be much lower than the portfolio value. Another rational reason for DNAVs is that the NAV of a Property Investment company does not reflect the capital gains tax payable by the shareholders on liquidation of the real estate portfolio.[92] Moreover, listed Property Investment companies can only pay dividends out of after tax income which may disadvantage some investors.

Another reason for deviations between Property Investment company share prices and NAV is valuation error. A major difference between Property Investment Company and investment trust NAV calculations are that investment trust NAVs are based on public market prices while Property Investment company NAVs are based on

88 Research on DNAVs is forthcoming. See for example Barkham and Ward (1996).
89 For a review of the investment trust puzzle see Lee, Shliefer and Thaler (1991).
90 For theories based on investor sentiment, see Lee, Shliefer and Thaler (1991) and Zweig (1973).
91 Support for this hypothesis is varied. In a survey of property analysts, Leming (1990) found management costs rated either very high or very low as a reason for discounts of Property Investment companies. Lee, Shliefer and Thaler (1991) argue that management costs are relatively fixed and thus cannot explain the large variations in investment trust discounts. Malkiel (1977) does not find a significant relationship between management fees, fund performance and discounts.
92 Brett (1990) and Adams and Venmore-Rowland (1989) argue that Property Investment Company NAVs calculated net of contingent tax (net net asset value) would result in lower DNAVs. Leming (1990) documents that following a reduction in capital gains tax liability from the 1988 budget, contingent tax liability gradually reduces until 1990 but DNAVs fluctuate with no clear correlation. Malkiel (1977) finds that for investment trusts, under generous assumptions, taxation cannot explain more than 6% of the DNAV.

valuations. However as discussed in the previous section if valuation errors are random this should not be problematic to large portfolios.

d. Adjusted NAV methodology for Property Investment company IPOs

Rational explanations suggest that Property Investment company share prices may vary from NAV per share because of: agency costs, liquidation discounts, taxation effects and valuation error. In the pricing of Property Investment company IPOs analysts adjust NAV per share for these deviations using an expected discount adjustment factor [a], as shown in equation [9].

$$s_t = NAVps_t * (1 - a) \qquad [9]$$

There are two methods for estimating the expected discount adjustment factor. First a measure of the average discount of Property Investment companies listed in the UK, such as the Warburgs SDNAV, can be applied to the NAV per share to estimate the appropriate offer price. This approach assumes the expected discount for a Property Investment IPO is equal to the current average discount of all firms in the sector. If the firm to be valued is considerably different from the average firm, the second approach is to select comparable firms to establish the adjustment factor.

The expected discount applied in these approaches can be seen as allowing for the rational reasons for discounts in the current market state. The expected discount represents the main source of error in the valuation of Property Investment IPOs. While no evidence exists as to the accuracy of estimated adjustment factors, again errors would appear to have a smaller effect than in comparable firm and DCF valuations. For example, if the error on the adjustment factor is 20% and the average DNAV is 23% then the valuation error on the equity value is +/-4.6%. Error on the adjustment factor would have to be greater than 65% for valuation error to equal the 15% average of other approaches.

Estimates of the appropriate discount for a Property Investment IPO are not likely to be based on explicit adjustments for valuation error, agency costs or taxation effects. However the payout from selling the underlying portfolio in the direct real estate market is a benchmark which can explain rational DNAVs, and could be used in pricing. A simple present value model that predicts rational deviations between Property Investment company share prices and NAVs is presented in the next section.

e. A present value explanation for deviations from net asset value

Consider a controlling shareholder of a listed Property Investment company that wants to sell her equity either by selling shares in the stockmarket or by the liquidation of the real estate portfolio in a public auction in the direct property market. To estimate the payout from the sale of the portfolio in the real estate market a portfolio valuation is commissioned from a valuer. The valuer undertakes the portfolio valuation on the same Open Market Value assumptions as applying to valuations in property company audited accounts or London Stock Exchange prospectuses. Two of the SAVP assumptions: (b) a reasonable period in which to negotiate the sale, taking into account the nature of the property and the state of the market, and (c) that values remain static during that period, are important to the occurrence of deviations between share prices and NAV.

If the shareholder has not made preparations for a sale in the real estate market before the valuation date [t=0] the portfolio valuation $\mathbf{Vp_0}$ assumes a marketing period (from t=0 to t=p) and marketing expenses yet to take place. Over the marketing period the company will incur capital costs [**i**]; receive net rental income with a future value of **fvnr** (at interest rate i) at the sale date; and have to pay marketing and agency fees [**m**] incurred with the sale of a portfolio.

Assuming constant market conditions over the selling period, a shareholder expecting a pay-off at the end of the marketing period of $\mathbf{Vp_0}$, would be indifferent to a payoff

today of the discounted portfolio valuation [$\mathbf{Sp_0}$]. The discounted portfolio valuation can be represented by equation [10].

$$Sp_0 = \frac{\left[Vp_0 - m + fvnr\right]}{(1+i)^p} \qquad [10]$$

Under arbitrage restrictions a company with **n** shares and total market value of debt of $\mathbf{d_0}$ should have a share price of $\mathbf{s_0}$.

$$s_0 = \frac{Sp_0 - d_0}{n} \qquad [11]$$

The rational DNAV is represented in equation [12].

$$DNAV = 1 - \frac{SP_0 - d_0}{Vp_0 - d_0} \qquad [12]$$

This model is based on the idea that the shareholder can either sell the shares immediately in the stockmarket or take the time and costs of selling the portfolio in the real estate market. The after cost payoffs from the two transactions should be equivalent.[93] As the real estate market transaction is typically more costly and time consuming, the shareholder will accept a discount from the portfolio valuation figure to sell her equity immediately in the stockmarket.

A major shortcoming of this simple approach is that it struggles to explain the premium NAV markets that occur from time to time. A possible reason for this is that the cost of carry formula ignores expectations of the varying supply and demand conditions of the underlying asset. In our case, the share price today is likely to reflect market expectations of growth [**g**] over the selling period rather than assuming $\mathbf{Vp_0}$ is achieved at time **p**. The expectations based $\mathbf{Sp_0}$* can be represented as follows:

93 For example, if the shareholder wanted to sell her equity in a single property company financed with debt of 50%, the value of the shares should be around 50% of the asset value of the property.

$$Sp_0^* = \frac{\left[Vp_0(1+g)^p - m + fvnr\right]}{(1+i)^p} \qquad [13]$$

The value of the portfolio today incorporates the present value of the difference in prices (proxied by valuations) between time 0 and p. If expected valuations at the end of the marketing period are equal to valuations at t=0 equation [10] remains. Incorporating expected change into the expression for $\mathbf{Sp_0^*}$ (and thus $\mathbf{s_0}$) presents at least a plausible explanation of the premium markets that appear around buoyant real estate markets. When the present value of the change in price of the portfolio is greater than the discount from $\mathbf{Vp_0}$, the shares should trade at a premium to net asset value.

This model is clearly too simple to fully explain DNAVs. The valuation error, taxation and agency costs reasons for discounts, which are likely to have an impact on DNAVs observed in the stockmarket, are ignored in the model. The model also implies that a sale of shares incurs no costs, which is clearly not the case. Importantly, the usefulness of this model in the context of Investment Trusts is also questionable. An Investment Trust holding a portfolio of liquid shares would be predicted by this model to have a very narrow discount; which is not usually observed.

Despite its several shortcomings the model does focus on principles that are likely to contribute to the discounts and premiums of Property Investment companies. The basic principles of the explanation: (i) that there should be one price for an asset, (ii) that the valuation of a real estate portfolio in the UK is based on strict assumptions, (iii) that transactions in the direct property market can be costly and time consuming compared to stockmarket sales, and (iv) that investors anticipate future selling conditions, may be useful future researchers to consider when searching for a rational explanation for discounts and premiums.

f. The pricing uncertainty of Property Investment and Development IPOs

The application of asset based methodologies makes the pricing of securitised real estate firms distinguishable from the pricing of operating company IPOs. Recently the differences between the pricing of US securitised real estate IPOs and operating company IPOs has drawn some attention. Below, Zaman and McIntosh (1995) and Ling and Ryngaert (1995) argue that securitised real estate IPOs in the US have lower pricing uncertainty than other IPOs because the real estate assets these firms own are more easily valued than the assets of operating companies. They conclude that the evidence of insignificant initial returns for REIT IPOs reported in their studies are consistent with REITs having low pricing uncertainty.

The asset value approach used to value Property Investment IPOs should lead to relatively small valuation errors for Property Investment IPOs. The rationale behind the adjusted NAV methodology for valuing Property Investment IPOs is that the offer price must relate to the payoff from selling the portfolio in the direct real estate market. If real estate valuation errors are random and a large number of properties are owned, the valuation error of the portfolio value should be very low compared to the error using conventional valuation approaches. If the expected DNAV of Property Investment IPOs can be estimated with any accuracy the adjusted NAV valuation of a Property Investment IPO should be more accurate than conventional valuations. The ability to compare the offer price of a Property Investment IPO to the adjusted net asset value per share reported in the prospectus should result in more certainty about the pricing of these IPOs.

Property Investment IPOs should also have more accurate DCF and comparable firm valuations than Property Development IPOs. In contrast to Property Investment companies, Property Development companies do not hold portfolios of real estate providing relatively stable contract rents; rather they receive lumpy and uncertain project profits. As Property Investment IPOs have more stable income streams one of the main components in comparable firm and DCF valuations is easier to assess for Property Investment IPOs.

To summarise, the pricing uncertainty of a Property Investment IPO is likely to be considerably lower than the pricing uncertainty of a Property Development IPO for two reasons. First, the pricing of a Property Investment IPO is based on the adjusted NAV methodology which should have smaller valuation errors than the DCF and comparable firm approaches. Second, the greater stability of earnings and earnings growth of Property Investment IPOs compared to Property Development IPOs should result in more accurate comparable firm and DCF valuations.

4 CONCLUSION

Securitised real estate firms allow investors access to the income and capital appreciation from real estate portfolios. The first part of this chapter introduced key characteristics of securitised real estate firms. The definition of a securitised real estate firm depends on the ownership of a real estate portfolio and the ability of management to make operating decisions. Property Investment companies in the UK are defined as active securitised real estate firms. Property Development companies in contrast are not defined as securitised real estate firms because they do not own real estate portfolios.

The existing literature concerning securitised real estate firms suggests that they are distinguishable from operating companies because of institutional differences and the fundamental link between firm value and the underlying portfolio value. Because of their uniqueness researchers have used securitised real estate firms to examine corporate finance decisions and found securitised real estate stocks behave differently from other equities.

A unique institutional characteristic of Property Investment companies is that they disclose the current value of their portfolio in the IPO prospectus. This chapter has discussed the adjusted NAV method of pricing Property Investment IPOs. While the NAV is not a perfect measure of the intrinsic value of a Property Investment IPO, it is likely to result in a better estimate than the use of cash flow and comparable firm

valuation approaches. This chapter argues that the pricing uncertainty of securitised real estate IPOs should be lower than the pricing uncertainty of operating company IPOs on average. In particular this chapter argues that Property Investment IPO offer prices are less uncertain than the offer prices of Property Development IPOs.

This chapter has established important concepts used in the empirical chapters which follow. The argument that Property Investment companies have more certain IPO prices than Property Development companies forms the basis of hypotheses in the initial and long-run performance analyses contained in Chapters 6 and 7. The importance of real estate market conditions to both Property Investment and Property Development companies is central to the examination of IPO activity in Chapter 9.

CHAPTER 6

The Initial Returns And Valuations Of Securitized Real Estate IPOs[Φ]

1 INTRODUCTION

The relationships between the pre-market valuation, secondary market prices and the intrinsic value of the issuing firm are central to the explanations of positive IPO initial returns reviewed in Chapter 3. For example, the belief that IPOs are underpriced is based on the assumption that intrinsic values are reflected in secondary market prices; thus initial returns are the result of offer prices being set at a discount to intrinsic values. Furthermore, underpricing models often infer that uncertainty surrounding the intrinsic value of an IPO is the crucial factor in determining the underpricing discount required by investors and thus the magnitude of initial returns.

Beatty and Ritter (1986) derive the cross-sectional implication that riskier issues should be more underpriced. Their model relies on the winners curse of Rock (1986), where uninformed investors demand underpricing because they are allocated the lowest quality IPOs. Beatty and Ritter (1986) suggest that if the value of an IPO is certain to all participants there is no need to underprice to attract uninformed investors, because no investor would be able to gain any more information than any other. An uninformed investor will not participate in uncertain IPOs unless the expected return conditional upon allocation is positive, which can only be achieved if underpricing exists on average. Thus more uncertain IPOs need to be underpriced more to attract investors.

Despite the importance of the pre-market valuation, there has been little direct evidence of the relationship between IPO valuations and initial returns. Chapter 5 discussed Kim and Ritter's (1996) study of the relation between offer prices and

accounting data used in the valuation of IPOs. The conclusion from their analysis was that the cross-sectional variation in offer prices is not explained by valuation variables. They attribute this to young firms in the same industry having earnings figures, price-earnings ratios and price-book ratios displaying large variations.

Securitized real estate IPOs are one group of new issues likely to have a degree of valuation certainty. An important institutional characteristic revealed in Chapter 4 was that property companies are required to report a market valuation certificate in their IPO prospectuses. Moreover, details of rentals and other useful real estate pricing information is disclosed in the prospectus. Chapter 5 has shown that Property Investment companies have the unique characteristic of being priced according to the value of their underlying real estate portfolio. They also have relatively stable income from contract rents. The combination of stable income, disclosure of real estate information in the prospectus, and the adjusted NAV pricing method should result in lower pricing uncertainty for Property Investment IPOs compared to Property Development IPOs.

The objectives of this chapter are threefold. First, to test the argument of Chapter 5 that Property Investment IPOs have more certain offer prices than Property Development IPOs. Second, to determine whether the difference in pricing uncertainty between Property Investment IPOs and Property Development IPOs results in differing initial performance, as predicted by Rock (1986) and Beatty and Ritter (1986). A difference in initial returns would be attributed to a real estate factor in IPO pricing. Third, to explore the relationship between intrinsic values, offer prices and secondary market prices using the special characteristics of Property Investment IPOs.

The analysis of Property Investment and Property Development IPO initial returns in this chapter tests the pricing uncertainty hypothesis of Beatty and Ritter (1986) and Rock (1986), and aims to determine whether a real estate factor causes the lower initial returns of US REIT IPOs. The insignificant or negative initial returns of REIT,

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Φ Parts of this chapter are contained in Gerbich and Levis (1996a). All content and errors are my own.

closed end fund and MLP IPOs, discussed in Chapter 2, are aberrant findings in the initial return literature. Attention has been focused on the pricing certainty of REITs, and the absence of informed traders in REIT markets to explain the low initial returns of REIT IPOs.

Relative pricing certainty is the accepted explanation for the low initial returns exhibited by closed end fund IPOs. Peavey (1990) contends that the units of closed end funds, are backed by assets (shares) with a relatively high liquidity and therefore funds have a degree of valuation certainty. This contrasts with the valuation uncertainty of common stocks, which are backed by illiquid assets and projects. If closed end funds have certain prices then the insignificant initial returns are consistent with value uncertainty underpricing models.

Based on Peavey's (1990) rationale, Below, Zaman and McIntosh (1995) argue REIT IPO initial returns are also consistent with the uncertainty implications of models such as Rock (1986). They posit that the real estate assets of REITs are more easily valued than the assets of industrial companies. Consequently REITs have more certain prices and lower underpricing is required by investors. They conclude that relative pricing certainty explains the insignificant initial returns of REITs.

Wang, Chan and Gau (1992) refute that certainty of value explains REIT first day returns and propose that the dominance of uninformed retail investors and other institutional characteristics explain the initial returns of REITs. This explanation is also consistent with the models of Rock (1986) and Beatty and Ritter (1986), however it shifts the causal emphasis to the symmetry of information accross market participants rather than pricing uncertainty. As well as the pricing uncertainty implication, Rock's (1986) model predicts that without informed investors underpricing for an IPO would be zero.

Evidence of REIT initial returns which is consistent with both the importance of information asymmetry and pricing uncertainty is revealed by Ling and Ryngaert (1995). They find that REITs listed during the 1990's are significantly underpriced

3.6% on average. In explaining the difference between their results and those from the pre-1990 sample reported by Wang, Chan and Gau (1992), Ling and Ryngaert (1995) argue post-1990 issues have considerably more managerial control and higher institutional holdings than previous new issues. They argue managerial control increases pricing uncertainty and institutional participation increases the likelihood that informed traders influence new issue pricing.

In contrast to REITs, Property Investment companies are active securitised real estate firms with freedom to decide dividend and capital structure policies, operating activities and shareholder weightings. It is anticipated that institutional investors hold a significant proportion of both Property Investment IPOs and Property Development. Levis and Thomas (1995) report institutional investors on average hold 79% of the equity of operating companies in the UK. If participation by potentially informed investors in both Property Investment IPOs and Property Development IPOs is similar to that of U.K operating companies there would not appear to be justification of the retail shareholder argument for Property Investment IPOs.

Property Investment companies have IPOs with lower pricing uncertainty than Property Development IPOs but with similar opportunities for informed investor participation. If IPO initial returns are the result of underpricing caused by uncertainty as to the intrinsic value of IPO firms, the initial returns of Property Investment IPOs should be lower than the initial returns of Property Development IPOs. This would suggest that a real estate valuation characteristic influences the initial returns of securitised real estate IPOs, and sheds some light on the reason why REIT IPOs have insignificant initial returns. The following hypothesis is tested in this chapter.

Hypothesis 1 : Pricing uncertainty and initial returns

Underpricing increases with pricing uncertainty. Property Investment IPOs have lower pricing uncertainty than Property Development IPOs because of their underlying real estate portfolio. Thus, Property Investment IPOs require lower underpricing and have lower initial returns than Property Development IPOs.

The final objective of the chapter is to explore the relationships between Property Investment IPO intrinsic values, offer prices and closing prices. Underpricing models contend that IPOs are offered below the value of similar seasoned firms because of the combined impact of factors such as pricing uncertainty, information asymmetry and agency conflicts. In the aftermarket the price reflects intrinsic value resulting in a positive initial return.

In particular the chapter tests whether the underpricing explanation for positive initial returns is robust in optimistic market conditions. Chapters 2 and 3 have discussed hot return markets. Periods when initial returns average in excess of 50%, have two interpretations. Hot return markets can be interpreted as evidence that the primary equity market is inefficient. Conversely hot return markets can be interpreted as intervals when firms issue shares far below intrinsic value.

Why firms should sell equity at such an extraordinarily large discount during hot periods is difficult to explain. The Bank of England (1990) contend that firms issue their shares below normal equilibrium underpricing in IPO hot return markets. They suggest that the most plausible explanation for hot return markets is some form of misperception by issuers rather than investors. They posit that early pricing indications up to 6 months before the issue are relied on by issuers even if strong market growth makes them out of date. Hot return markets found near stock market peaks may be caused by managers systematically undervaluing their firms and underpricing their shares excessively. In the first trades in the secondary market intrinsic value is established thus resulting in high initial returns.

The undervaluation explanation of hot return markets maintains the assumption of secondary market efficiency and is particularly convincing for the pricing of

securitized real estate new issues. The adjusted NAV methodology described in Chapter 5 relies on real estate valuations being good proxies for prices. If valuation errors are not random over time then the adjusted NAV methodology could produce biased estimates of value.

Discussing valuation error, Matysiak and Wang (1995) argue that two systematic effects cause the difference between real estate valuations and prices. First, due to the valuation date often being a considerable time before the sale date, market movements in the intervening period will cause error. This error type accords with the view of IPO valuation errors presented by the Bank of England (1990). Based on empirical results Matysiak and Wang (1995) suggest there is also a valuation bias dependant on market conditions which causes large differences between prices and valutions.[94] Matysiak and Wang (1995) estimate a model of price against valuation with market condition dummies. Their results indicate that valuers undervalue in booming markets and overvalue in slump markets.[95]

Evidence of downward biased real estate valuations has important implications for the pricing of securitized real estate IPOs. Managers of firms relying on out of date and downward biased real estate portfolio valuations could undervalue their equity. This systematic undervaluation is most likely to occur in periods of rapidly rising prices, which is when hot return markets tend to be found. This chapter examines whether Property Investment IPOs are undervalued relative to seasoned Property Investment companies at the offer price, and have fair valuations at the first day close price, during optimistic market conditions.

The empirical findings in this chapter can be summarised as follows; (i) Property Investment IPOs have lower pricing uncertainty than Property Development IPOs. (ii) Consistent with underpricing models that predict a positive relationship between initial returns and pricing uncertainty, Property Investment IPOs have lower initial

94 Possible reasons for the valuation bias are pragmatic conservatism and backward looking valuers. When new information arrives fast to the market causing a rapid change in price the small number of individuals who undertake valuations do not adjust valuations until they have evidence of the adjustment in prices. Thus valuations lag the true private equity price. Also clients do not like seeing rapidly decreasing values and courts do not like seeing rapidly increasing ones.

returns than Property Development IPOs. This suggests that there is a real estate pricing characteristic influencing securitised real estate IPO initial returns. (iii) Property Investment IPOs are on average found to be offered at an insignificant 2.50% discount from the DNAV of seasoned Property Investment companies, suggesting that low underpricing is required for these IPOs. (iv) At the end of the first day Property Investment IPOs are on average found to be priced at an insignificant 0.59% premium to the DNAV of seasoned Property Investment companies, consistent with an efficient secondary market. (v) During periods when the SDNAV is at a premium, Property Investment IPOs are offered at prices below the value of seasoned firms, but this difference disappears by the end of the first day.

The remainder of the chapter is organised as follows: Section 2 describes the sample and research methodology. Empirical results are presented in section 3. Concluding comments are made in section 4.

2 METHODOLOGY AND SAMPLE

a. Sample

A total of 101 firms obtained a listing on the Property sector of the London Stock Exchange between January 1980 and December 1994. Several of these firms have had to be excluded from the sample. Four firms were excluded because their principal activity was agency or consulting rather than the investment, development or trading of real estate. 13 firms were excluded because they entered the exchange by Introduction and raised no new equity. 13 companies were excluded because data regarding the offer price, business activity or amount and type of issue was not available. Thus, the total number of firms in the sample is 71.

Data were derived from the KPMG New Issue Statistics, the Investors Chronicle, SBCWarburgs property sector annual reviews and from summaries of the individual

95 It is important to note that the impact of this bias has yet to be empirically determined. It could be that the bias will have only a minor effect on property values.

offer prospectuses published by Extel Financial Ltd. Price and accounting data for all issues were collected principally from Datastream. For 8 firms in the sample aftermarket prices were not available on Datastream, and therefore a sample of 63 firms is used when aftermarket price data is required. For 6 firms in the sample, data necessary to determine the DNAV at the issue price was not available, thus a sample of 65 firms is used when this variable is required.

For comparison to REITs and other securitized real estate investments, and for determining the pricing uncertainty of these IPOs, the definition of the property company is important. Categorising firms with a discrete category, Property Investment or Property Development, is complicated by the multi-functional nature of most property companies. The categorisation of firms according to business activity is as follows. For each IPO company the stated activity of the company reported in the Investors Chronicle, KPMG new issue statistics and Extel prospectus summary were recorded. A company is initially categorised as a Property Investment company if the business activity stated in the prospectus is real estate "investment only". If a company stated its activity as "development only" it was initially categorised as a Property Development company. Final categorisation was checked with the Rent-Earnings ratio [RE_i]. Similar to the classifications used for the Limburg Institute of Financial Economics Global Real Estate Securities Indices, if a company reported in the Extel prospectus summary sheets that the pro-forma Rent-Earnings ratio was 0.5 or greater, it was classified as a Property Investment company.[96] Other firms were classified as Property Development companies.[97] 31 companies are categorised as Property Investment IPOs and the remaining 40 are defined as Property Development IPOs.

$$RE_i = \frac{Rent_t}{Earnings_t} \qquad [1]$$

96 Datastream codes definition; Rent-Earnings Ratio =106/805; where 106=Gross Rents before deduction of any charges such as rates, land rents or other. 805=106+803+804, 803=gross revenue received from the sale of property, 804=other revenue not included in 106 or 804.

97 The classification methodology results in a number of firms with business activities of real estate investment and development and/or trading being classified into one of the two groups.

b. Methodology

The first day return of each IPO [r_i] is calculated from the offer price to the closing price of the first trading day.

$$r_i = \frac{p_1}{p_0} - 1 \qquad [2]$$

For each issue the first day adjusted return [Ar_i] is defined as the first day return less the equivalent change in the FT All Share Index [r_m].

$$Ar_i = r_i - r_m \qquad [3]$$

Securitized real estate firms provide a unique opportunity to explore the relationship between prices and fundamental value. The principal information required for estimating the fundamental value of a Property Investment company is the net asset value per share [$NAVps_i$]. In this study $NAVps_i$ is estimated by the difference between the pro-forma total shareholders funds [TSF_i] and the total book value of liabilities [DBV_i], divided by the number of shares on issue after the offer [n_i].[98]

$$NAVps_i = \frac{TSF_i - DBV_i}{n_i} \qquad [4]$$

In the UK obtaining the $NAVps_i$ of a property firm as reported in the listing particulars (without having the original prospectus) is not easily achieved. Computer based data sets such as Datastream or Extel do not carry such detailed accounting information. Sources of IPO information such as the KPMG new issue statistics, the Investors Chronicle and stock brokers reports provide incomplete and sometimes misleading data. To be certain the $NAVps_i$ data set is as error free as possible the $NAVps_i$ of each firm has been manually recorded from the company offer prospectuses archived by Extel Financial. Complete information was unavailable for

98 Because of data unavailability calculation of fully diluted net asset value; assuming that any options are taken up and convertible securities are converted into equity; was not able to be undertaken. However, as few of the firms with data available listed with options or convertibles, this does not appear too problematical. Data unavailability also does not allow the market value of debt holdings to be calculated, so book values are relied on.

three Property Investment IPOs making the final number of companies in the adjusted NAV pricing analysis 28.

If $NAVps_i$ is a proxy for fundamental value it would be expected for property company shares to trade near estimated NAVs. However, as discussed in Chapter 5 Property Investment company shares usually trade at a discount to NAV. The discount/premium at which the offer price of each firm is set from the $NAVps_i$ is calculated below as $DNAVps_{it}$.[99]

$$DNAVps_{it} = 1 - \frac{p_0}{NAVps_i} \qquad [5]$$

The discount/premium at the end of the first day of trading is calculated similarly using the closing price.

$$DNAVps_{it+1} = 1 - \frac{p_1}{NAVps_i} \qquad [6]$$

To determine whether a Property Investment IPOs is priced correctly, the $DNAVps_{it}$ and $DNAVps_{it+1}$ are compared with an estimate of the expected discount. The proxy variable for the expected discount is the average discount to estimated net asset value of firms in the sector [SDNAV].

Several investment banks report SDNAV series for property companies on the London Stock Exchange. The most prominent series are those reported by SBCWarburg and UBS Phillips and Drew. The Warburg SDNAV has been adopted primarily because of the length of this series.[100] The SBCWarburg series is compiled as the value weighted average of discounts for a selection of firms which SBCWarburg analysts research on a regular basis. While the composition of the firms in the series changes over time, as at the beginning of 1996 42 companies, including the largest firms in the sector were in the series. It is important to note that the NAVs included in computations are based on estimated current net asset value and not the

99 Where possible the resulting discounts are cross-checked with those reported in the SBCWarburg property sector annual review.

100 There is very little difference between the views of these two competitors. Time series correlation coefficients between the SBCWarburg and UBS Phillips and Drew DNAV series are in excess of 0.93.

net asset value published in the previous company reports. The series is updated with price data weekly on Wednesdays and NAVs are usually updated at least quarterly.

Subtracting the Warburgs SDNAV in the month of the issue from $DNAVps_{it}$ and $DNAVps_{it+1}$ gives a margin or abnormal discount measure [M_{it}]. This variable is used to determine whether a Property Investment IPO is under or overvalued relative to seasoned firms.

$$M_{it} = DNAVps_{it} - SDNAV_t \qquad [7]$$

The $DNAVps_{it}$ and M_{it} of the IPO also indicate valuation uncertainty. If real estate assets reduce uncertainty it is because the value of these assets provide a reliable pricing measure. Consequently Property Investment company $DNAVps_{it}$ and M_{it} should have a low cross-sectional mean and variance. In contrast Property Development companies have few tangible assets and a wide range of premiums is expected to be found cross-sectionally.

Two further variables are used to proxy the pricing uncertainty of Property Investment and Property Development IPOs. The first variable is ex-post price return volatility [$\mathbf{Vol_i}$]. Used in Ritter (1987), Wang, Chan and Gau (1992) and other studies, this variable relies on the assumption that greater variation in returns after the IPO indicates that the price of the issue was also uncertain. $\mathbf{Vol_i}$ is calculated as the standard deviation of the daily price returns from day 2 to day 20.

$$Vol_i = s.d_{t=2}^{20}\left[\frac{p_{t+1}}{p_t} - 1\right] \qquad [8]$$

The second proxy for uncertainty derives from the segmentation model of Mauer and Senbet (1992). They argue the greater the uncertainty of firm cash flows not spanned by the secondary market, the greater the underpricing investors require from the IPO. Unspanned cash flows are related to specific risk and not market risk, thus the variance of returns not explained by market beta is the important type of risk for IPO investors.

To proxy for this type of uncertainty about IPO pricing, the square root of the mean square error from Dimson (1979) market model time-series regressions [$\mathbf{Res_i}$] can be used. This variable represents the residual risk of each issue. The market beta coefficients are summed over 2 leads and 5 lags to reduce the downward intervaling-effect bias found when estimating beta from daily data. The regression equations are estimated using between 120 and 150 days of after-market daily continuous compounded total returns. The regression equation estimated on each firm is written below.[101]

$$r_{jt} = a + \sum_{k=-5}^{+2} B_{jk}\, rm_{t+k} + e_{jt} \qquad [9]$$

Where: r_{jt}= the total return for IPO j at time t, a = constant, B_{jk} = estimated coeficients, rm_{t+k}= total return for the FT All Share Index at time t+k, k=-5..,0..,+2, e_{jt}= residual error.

3 EMPIRICAL RESULTS

a. The level of block shareholders in securitised real estate IPOs

Before examining the uncertainty and initial returns of Property Investment and Property Development IPOs the level of informed investor participation in these firms is investigated. Because time series data of shareholdings of UK companies is very limited, two analyses are undertaken to estimate the likely ownership characteristics of Property Investment and Property Development IPOs.

For a sample of 13 Property Investment companies the percentage of shares held in block shareholdings at the end of the year after their IPO is calculated. Following the arguments of Wang, Chan and Gau (1992) and Ling and Ryngaert (1995) the

101 As is usual with returns from IPO firms evidence of thin trading in the aftermarket of the IPO is found Combinations of leads and lags were used, with the highest beta pairing adopted for the analysis. The mean squared errors do not appear to be sensitive to at least small changes in the lag and lead structure; correlation coefficients between mean squared errors based on differing structures are in excess of 0.95.

influence of informed investors can be proxied by the participation of block shareholders. These large holdings are usually held by institutions or other investors that are likely to be informed.[102]

Table 6.1 shows that block shareholdings in Property Investment IPOs after one year average 55.02% of firm equity.[103] This level of block shareholding is greater than the institutional participation in REIT IPOs reported by Wang, Chan and Gau (1992) (12.06%) or Ling and Ryngaert (1995) (41.6%) or the US closed end fund IPOs reported by Weiss (1989) (4.68%).

Table 6.1 Shareholdings in IPOs after one year

Security Type	Block Shareholdings
Property Investment IPOs	55.02
All REIT IPOs pre-1990♣	12.06
All REIT IPOs post-1990♦	41.6
Mortgage REIT IPOs♣	5.36
Equity REIT IPOs♣	18.64
Hybrid REIT IPOs♣	14.20
Closed End Fund IPOs #	4.68
US IPOs #	28.59

To determine the likely shareholdings in Property Development IPOs a further analysis is undertaken of the current block shareholdings of all Property Investment

102 Data of the initial shareholdings of IPOs is not available on the Datastream files or from Extel prospectus summaries. Data is available on the current shareholdings of listed firms on the Datastream files. As 13 Property investment IPOs listed in 1994, the year end shareholdings were able to be downloaded for these firms at various times over 1995. Unfortunately no data was available of the shareholdings of Property Development IPOs because none of these IPOs occurred during the period of this research.

103 Combined with the average 16.68% holdings of Director's, the total proportion of holdings potentially informed is 71.69%.

♣ Wang, Chan and Gau (1992) Table 9. Mortgage REITs differ form Equity REITs because they hold commercial mortgages as assets instead of real estate. Hybrid REITs own both Mortgages and real estate.

♦ Ling and Ryngaert (1995) Table 2

Weiss(1989) Exhibit 6.

and Property Development companies listed on the London Stock Exchange, for which shareholding and earnings data could be found.[104]

Table 6.2 presents the REIT and property IPO shareholdings after one year, alongside the shareholdings of seasoned Property Investment and Property Development companies, grouped into size portfolios. The mean block shareholdings of seasoned Property Investment IPOs and Property Development are 37.21% and 36.01% respectively. There appears to be lower involvement by large shareholders in seasoned Property Investment companies than in Property Investment IPOs after one year. As with REITs there appears to be no clear size influence in shareholdings for UK property companies.

Making conclusions regarding likely IPO shareholdings from one year post issue data and data on current shareholdings of similar seasoned companies can only be tentative.[105] Faced with such limited data, we first ask whether Property Investment IPO subscription is likely to be dominated by uninformed retail shareholders. The data from one year post issue and from seasoned companies would not appear to support this contention. Block holdings of greater than 37% indicate retail investors are not likely to dominate completely. The second question of interest is whether Property Development IPOs have a dissimilar participation by uninformed shareholders relative to Property Investment IPOs. Although even less data is available to test this issue, the results for seasoned firms do not suggest that retail shareholders are any more or less dominant for Property Development IPOs. Thus these results cannot reject the presence of both informed and uninformed investors in both Property Investment and Property Development IPOs.

104 Firms are grouped as Property Investment and Property Development companies depending on the Rent-Ernings ratio.
105 I would like to thank Dylan Thomas for emphasising this point.

Table 6.2 Shareholdings of Property IPOs, REIT IPOs and seasoned firms

	Property Investment IPOs (after one year)	REIT IPOs* (after one year)	Seasoned Property Investment companies [106]	Seasoned Property Development companies [107]
	Mean % Block Shareholding	Mean % Block Shareholding	Mean % Block Shareholding	Mean % Block Shareholding
All firms	55	12	37	36
Smallest	53	11	35	31
Mid	60	10	60	48
Largest	52	15	34	29
Observations	13	68	62	19

b. Property Investment company pricing uncertainty

If Property Investment IPO offer prices are more certain than Property Development IPO prices then Property Investment IPOs should have: (i) lower mean aftermarket return volatility, (ii) lower residual risk, and (iii) a consistent relationship with NAVs.

Table 6.3 presents the mean volatility, residual risk, and $DNAVps_{it}$ of Property Investment and Property Development IPOs. Panel A shows that Property Investment IPOs are typically priced at a statistically and economically significant discount to net asset value. The results suggests that original shareholders on average accept a reduction of 11.95% from their $NAVps_i$ at the offer price. The low standard deviation (0.1257) of Property Investment IPO $DNAVps_{it}$ indicates a close association of price and asset backing for Property Investment companies. Conversely, for Property Development IPOs there appears a high average premium to net asset value (284.57%) and premiums vary considerably from firm to firm (as shown by the standard deviation). These findings support the contention that NAV is a useful pricing measure for Property Investment IPOs and is not useful for Property Development IPOs.

* Wang, Chan and Gau (1992) Table 9.
106 as at 1/6/95

Panels B and C report the results of the uncertainty proxy variables $\mathbf{Vol_i}$ and $\mathbf{Res_i}$. Property Investment IPOs have less than half the mean volatility of returns in the early aftermarket than Property Development IPOs. Similarly, the mean residual risk for Property Investment IPOs is about half that found for Property Development IPOs. If the relationship between asset value and offer price, ex-post volatility, and residual risk are adequate proxies for ex-ante uncertainty, then Property Investment IPOs appear more certain than Property Development IPOs.

Table 6.3 Pricing uncertainty of Property Investment and Development IPOs

Uncertainty Variable	Property Investment IPOs	Property Development IPOs
Panel A: $DNAVps_{it}$		
Mean	11.95%	-284.57%
(t-Test)	(5.04**)	(-3.39**)
Median	10.13%	-111.99%
Standard Deviation	12.57%	510.29%
Observations	28	37
Panel B: Vol_i		
Mean	0.0156	0.0334
Median	0.0133	0.0152
Standard Deviation	0.0093	0.0491
Observations	27	36
(t-Test of difference in means)		(2.13**)
Panel C: Res_i		
Mean	0.0124	0.0213
Median	0.0092	0.0185
Standard Deviation	0.00863	0.0115
Observations	27	36
(t-Test of difference in means)		(3.51**)

** 95% significance for a two tail test.

c. Initial returns of Property Investment and Development firm PIPOs

This section examines the average initial returns of Property Investment and Property Development IPOs. The results in Table 6.3 suggest that Property Investment IPOs have more certain prices than Property Development IPOs. If pricing uncertainty

107 as at 1/6/95

causes underpricing, lower initial returns should be observed for Property Investment IPOs compared to Property Development IPOs. Any difference in initial returns should not be associated with informed investor participation as both Property Investment and Property Development IPOs are likely to have informed investors. Rather, any difference in average initial returns indicates a real estate pricing characteristic influences the underpricing required by investors from securitised real estate IPOs

Table 6.4 presents descriptive statistics of the market adjusted first day returns (equation [3]) and offering characteristics of Property Investment and Property Development IPOs. The mean first day return of 6.97% for the full sample is significantly positive. The mean first day return of 2.96% and the median return of 2.08% for Property Investment IPOs are also positive. The magnitude of initial returns for Property Investment IPOs appears lower than the 14.30% and 8.57% mean and median measured for UK IPOs by Levis (1993), and substantially higher than Wang, Chan and Gau's (1992) average initial return of -2.94% for All REITs and -3.95% for Equity REITs. Rather, Property Investment IPO initial returns appear to be very near those of post-1990 REITs found by Ling and Ryngaert (1995).

In contrast, Property Development IPO initial returns appear similar to the initial returns of other operating companies. The mean and median initial return of Property Development IPOs are 10.08% and 5.89%; both higher than the measures of Property Investment IPOs. Only 18% of Property Development IPOs have negative initial returns whereas 29% of Property Investment IPOs appear to be overpriced. These results indicate that the real estate assets underlying Property Investment IPOs reduce pricing uncertainty resulting in lower initial returns.

The descriptive statistics in Table 6.4 highlight the size difference between Property Investment and Property Development IPOs. The mean amounts raised and market capitalisations of Property Investment and Property Development IPOs suggest that Property Investment IPOs are typically larger than Property Development IPOs. Given the probable inverse relationship between uncertainty, information symmetry and the

size of the issue this could be an additional reason for Property Investment firms to have smaller initial returns. However, the median amounts raised and market capitalisations of Property Investment and Property Development IPOs suggest that a few large Property Investment IPOs influence the means. Tests on the difference in initial returns for the largest and smallest firms in the sample indicates that small firms have higher initial returns but the difference in initial returns is not statistically significant.[108]

Table 6.4 Initial returns of Property Investment and Development IPOs

	Full Sample	Property Investment IPOs	Property Development IPOs
Sample	71	31	40
Mean Adjusted Return %	6.97	2.96	10.08
t-Test	4.65**	2.75**	4.25**
t-Test difference in means			-2.73**
Median Adjusted Return %	4.23	2.08	5.89
% of Adjusted Returns <0	23	29	18
Std Dev Returns	0.12	0.06	0.15
Size [1995 £000s] Mean	54,387	76,471	37,272
Size [1995 £000s] Median	17,818	17,750	18,492
Amount Raised [1995 £000s] Mean	14,352	20,746	9,396
Amount Raised [1995 £000s] Median	5,386	7,077	4,731

** 95% significance for a two tail test

d. Market conditions, initial returns and property IPO valuations

An implication of the undervaluation-efficient markets explanation for securitised real estate IPO hot return markets is that bouyant market conditions (when prices are rising) should be associated with higher initial returns. To investigate whether inter-

108 Examination of the effect of size within the Property Investment and Property Development IPOs samples suggests that large Property Investment IPOs are associated with near zero returns while the size effect is not apparent for Property Development IPOs. Because the sample sizes are so small a more detailed analysis is not likely to give other than tentative findings. The difference in initial returns between Offers For Sale and Placings was also investigated. The mean initial return for Placings was found to be insignificantly different from that of Offers For Sale.

temporal variation in initial returns is caused by firms being systematically undervalued this section examines the effect of market conditions on: (i) initial returns from Property Investment and Property Development IPOs, and (ii) the abnormal discount to net asset value of Property Investment IPOs.

Market conditions for UK property shares are usually defined according to the SDNAV. When the SDNAV stands at a premium, valuations are no longer in their usual relationship to prices. As discussed in Chapter 5, premium markets can be explained by investor's expectations of real estate market price increases outweighing the rational reasons for a discount from net asset value. It would be most likely that any systematic undervaluation of Property Investment IPOs would occur in conditions where investors expectations play an important role in pricing. In this section the Warburgs SDNAV is adopted as a proxy for market conditions. It is investigated whether initial returns from Property Investment and Property Development IPOs increase when the Warburgs SDNAV moves toward a premium.

The first stage of the analysis is to record for each firm the Warburgs SDNAV at the time of listing. The sample is then divided into groups based on whether the issue date Warburgs SDNAV was at a premium or discount. All firms with an issue date Warburgs SDNAV of less than zero are in the Premium group, with the remainder being in the Discount group. Descriptive statistics are then computed for the two portfolios.

Table 6.5 reports the average initial returns for the entire sample and Property Investment and Property Development IPO sub-groups, dependant on market conditions. The average initial returns increase for the entire sample, Property Investment and Property Development IPOs when the Warburgs SDNAV stands at a Premium. For the full sample the mean initial return in Premium markets is 12.78%. This is more than double the 5.54% mean in Discount markets.

Property Investment IPOs appear to be less sensitive to market conditions. In Premium markets the average return is higher than that found in Discount markets but this difference is not significant.

Property Development IPOs typically have a large increase in initial returns when the Warburgs SDNAV stands at a premium. Initial returns for a small group of firms issued in Premium markets average almost 24%. This is three times greater than the mean initial return in discount markets. The median initial return for the Premium group is even higher at 28.36%.

Table 6.5 Market conditions and property IPO adjusted initial returns

	Sample	Mean Adjusted Return %	Median Adjusted Return %	% Ar_i <0	Std Dev Return	t-Test
Full Sample						
Premium	14	12.78	10.19	21	0.15	1.95*
Discount	57	5.54	3.51	23	0.11	
Property Investment IPOs						
Premium	8	4.54	4.22	25	0.08	0.83
Discount	23	2.40	1.73	30	0.05	
Property Development IPOs						
Premium	6	23.77	28.36	17	0.17	2.18**
Discount	34	7.66	5.16	18	0.13	

** 95% two tail test, * 90% two tail test

To explore the relationship between issue prices and valuations, the abnormal discounts of Property Investment IPOs in Premium and Discount market conditions are examined. The undervaluation-efficient market explanation for hot return markets suggests that when prices rise rapidly, firms are priced below intrinsic values and any underpricing discount. The reversion of prices to intrinsic values in the aftermarket

results in large initial returns. On the other hand, overvaluation explanations of hot return markets predict that initial returns are the result of irrationality, and firms are priced above intrinsic value in the aftermarket.

As explained in the methodology section the margin between the $DNAVps_{it}$ and $SDNAV_t$, denoted M_{it} in equation [7], is used to proxy for under or overvaluation. An abnormal discount [$M_{it}>0$] indicates the issue is priced below intrinsic value and an abnormal premium [$M_{it}<0$] indicates the issue is priced above intrinsic value.

Panel A of Table 6.6, presents descriptive statistics of M_{it} at the offer price (t=0), and at the closing price of the first day (t=1), for the sample of 28 Investment firms with identifiable $DNAVps_{it}$. Property Investment IPOs, issued in all market conditions, appear on average to be listed at prices very near the Warburgs SDNAV. On the issue day they are sold on average at a 2.50% greater discount than other firms in the market. By the end of the first day Property Investment IPOs trade slightly above the average discount of seasoned firms (-0.59%). Both these margins are indistinguishable from zero. These results suggest that the offer and close price are both close to intrinsic values for Property Investment IPOs.

Panel B breaks the sample into firms which were issued when the market was in a Premium or Discount state. Although the sample of firms issued in Premium markets contains only 8 firms, a significant abnormal discount is found for Property Investment IPOs at the offer price. During Premium markets the average abnormal discount is 9.38%. This is evidence of larger required underpricing for Property Investment IPOs in premium markets. At the closing price this margin becomes insignificant from zero. 7 of the 8 firms are undervalued at issue during these market conditions.

Contrasting the results in Premium markets, in Discount market conditions no significant difference between the Warburgs SDNAV and the discount of Property Investment IPOs exists at the offer or closing prices. Abnormal premiums average -0.76% and -2.47% at the offer and close prices respectively. In Discount markets

only 42% of firms issued are undervalued at the offer price. The difference between the average (offer price) M_{it} in Premium and Discount markets is significant (t-statistic -2.15).

Although the samples are too small to make definite conclusions, Property Investment IPO adjusted NAVs are generally consistent with efficient pricing in the secondary market and pricing below intrinsic value at the offering stage. In periods when initial returns are most likely to be affected by overoptimism it appears the original shareholders of Property Investment IPOs typically accept a greater DNAV than is required by seasoned firms. By the end of the first day this abnormal discount disappears, suggesting a relatively efficient secondary market. This evidence is consistent with excessive underpricing occurring in buoyant market, possibly because of valuation bias. The small average difference between adjusted NAV and the Warburgs SDNAV is further evidence of the relative pricing certainty of Property Investment IPOs.

Table 6.6 The effect of market state on Property Investment IPO valuations

Market State	Sample	Abnormal Discount Mean %	t-Test	Abnormal Discount Median %	Undervalued %	Std.Dev
Panel A						
All conditions						
t=0	28	2.50	1.07	0.55	54	12.32
t=1	28	-0.59	-0.94	-0.54	50	12.14
Panel B						
Premium market						
t=0	8	9.38[109]	2.40**	11.34	87.5	11.05
t=1	8	3.39[110]	0.88	6.48	87.5	11.54
Discount market						
t=0	20	-0.25	-0.09	-3.72	40	11.77
t=1	20	-2.18	0.79	-4.49	35	12.26

109 A t-Test of the difference between premium and discount offer price abnormal discounts = -2.15**.
110 A t-Test of the difference between premium and discount close price abnormal discounts = 1.19.

4 CONCLUSION

This chapter uses the special valuation characteristics of UK Property Investment IPOs to gain insight into the characteristics of IPO initial returns. The chapter first tests the pricing uncertainty and initial returns of Property Investment and Property Development IPOs. Chapter 5 concluded that the process of pricing a Property Investment IPO is likely to be quite different from the pricing of operating company IPOs and Property Investment IPO prices should be more certain than Property Development IPO prices.

This chapter finds evidence supporting the hypothesis that Property Investment IPOs have more certain prices than Property Development IPOs: (i) Property Investment IPOs are issued at prices near NAV in all market conditions. (ii) The average difference between the NAV of Property Investment IPOs and the SDNAV at the offer (2.5%) and close price (-0.59%) is very small. (ii) Property Investment IPOs typically have lower volatility of returns in the early aftermarket than Property Development IPOs. (iii) The residual risk for Property Investment IPOs is on average lower than that found for Property Development IPOs. If these measures adequately proxy the uncertainty surrounding the intrinsic value of an IPO, then Property Investment IPOs have more certain prices than Property Development IPOs.

This study also reveals that the share holdings of Property Investment and Development IPOs are unlikely to be dominated by uninformed investors. The average participation by blockholders in property companies and Property Investment IPOs indicates there may be information asymmetry between investors in these markets. The pricing uncertainty and shareholding analyses suggest that Property Investment IPOs have relatively low pricing uncertainty but still have informed investor participation.

The initial returns of Property Investment and Property Development IPOs provide a test of whether a real estate characteristic affects the initial returns of securitised real estate IPOs. Consistent with the difference in pricing uncertainty between Property

Investment and Property Development companies, Property Investment IPOs have significantly lower average initial returns than Property Development IPOs. Property Investment IPOs have average initial returns of 2.6%, which is similar to that reported by Ling and Ryngaert (1995) for post-1990 REIT IPOs. It appears that the adjusted NAV methodology used for valuing Property Investment IPOs is more reliable than the conventional approaches adopted for Property Development IPOs. These results support the pricing uncertainty explanation of lower initial returns for REIT IPOs proposed by Below, Zaman and McIntosh (1995).

This chapter has explored the relationship between IPO prices and intrinsic value in varying market conditions. Initial returns from Property Investment and Property Development IPOs appear to be affected by the Warburgs SDNAV. When the Warburgs SDNAV moves to a premium, initial returns from property IPOs increase. Average initial returns from Property Investment IPOs increase from 2.40% to 4.54% during Premium markets but this difference is insignificant. Property Development IPO initial returns increase more dramatically. Property Development IPO average initial returns increase from 7.66% in Discount markets to 23.77% in Premium markets.

To investigate whether Property Investment IPOs are undervalued in market states where valuation bias is likely to occur the abnormal discounts of 28 Property Investment IPOs were estimated at the offer and closing prices. Independent of market conditions Property Investment IPOs are typically priced at a DNAV indistinguishable from the Warburgs SDNAV at the offer and closing prices. Evidence from varying market conditions suggests that Property Investment IPOs are issued below intrinsic value when in market conditions associated with potential valuation bias. At the end of the first day Property Investment IPOs are typically priced in accordance with the Warburgs SDNAV.

The results are consistent with both underpricing explanations of initial returns and the undervaluation explanation of hot return markets. The evidence contradict the existence of overoptimistic periods for these specialist IPOs. The secondary market

does a reasonably good job in valuing new Property Investment firms, consistent with the relatively low initial returns found for these IPOs.

This study poses a question for the long-run performance of Property Investment IPOs examined in Chapter 7. If the long-run underperformance of new equity issuers emanates from over-optimism at the time of the issue, then firms which are correctly priced in optimistic market conditions should not underperform in the aftermarket at all. Thus explanations such as the cognitive bias hypothesis, imply that Property Investment IPOs should perform indistinguishably from seasoned Property Investment companies in the long-run.

Given the amount and quality of data available the conclusions made from this study can be tentative only. However, there are interesting conclusions from this chapter: (i) The pricing uncertainty of firms with real estate portfolios is relatively low. (ii) There appears to be a real estate characteristic affecting the initial returns of securitised real estate IPOs. (iii) Initial returns are related to industry specific market conditions. (iv) Property Investment IPOs are efficiently priced in the secondary market and do not appear to be overvalued in optimistic market conditions.

CHAPTER 7

The Long-Run Performance Of Securitized Real Estate IPOs and Rights Issues[Φ]

1 INTRODUCTION

The long-run underperformance of IPOs is one of the most well established stylised facts in the corporate finance literature.[111] Chapter 2 reviewed evidence which shows a similar pattern of underperformance has been identified in the US, UK, Japan and a number of other countries. Chapter 2 also showed that a similar underperformance effect is being established for firms that have made an SEO.

While the empirical literature provides overwhelming evidence of average underperformance, a detailed scrutiny of the results reveals some important cross-sectional differences in the performance of equity issuers. Several of the studies reviewed in Chapter 2 have noted that the worst performing firms are small and young growth firms with high pricing uncertainty. There also exist significant inter-industry variations in long-run performance.

This chapter has four objectives. First, to determine the existence of new issue effects in securitised real estate markets. Second, to establish the effect pricing uncertainty has on the long-run performance of equity issuers. Third, to test whether the cognitive bias explanation or firm specific characteristics can explain long-run underperformance. Fourth, to determine whether the special characteristics of rights issues result in better long-run performance than that exhibited by external SEO issuers.

This chapter extends the equity issuance empirical literature by documenting the long-run performance of UK Property Investment and Property Development company IPOs and rights issues (hereinafter "PIPOs" and "PRTs" collectively and Property Investment IPO/RTs or Property Development IPO/RTs separately). For

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Φ Parts of this chapter are contained in Gerbich, Levis and Venmore-Rowland (1996). All content and errors are my own

111 For a review of stylised empirical facts in raising equity capital see Levis (1996).

investors in international securitized real estate markets, evidence of underperformance by operating firms following new issues may cause a reluctance to invest in securitised real estate new issues, thus threatening an important aspect of market growth. Chapter 2 showed that there has been no evidence of the long-run performance of securitised real estate equity issuers to determine whether new issue effects also exist in securitised real estate markets. This study of Property Investment IPOs and RTs is motivated by the recent growth in securitized real estate markets internationally, the unique pricing mechanism of these firms, and the absence of analysis on securitised real estate equity issuers to advise prospective investors.

One of the conclusions from Chapter 3 is that despite a large body of empirical literature, the reasons underlying new issue underperformance are not entirely understood. This chapter offers some unique insights into the firm characteristics associated with new issue underperformance and tests the explanation that periods of over-optimism exist in new issue markets. The cognitive bias hypothesis introduced in Chapter 3 is based on the idea that investors expect equity issuers to continue having abnormally high operating performance. When the earnings of issuers fail to meet expectations in the aftermarket, prices decline, resulting in underperformance.

If cognitive bias induced over-optimism is the cause of the new issue effect we would expect to find differences in the long-run performance of firms depending on their susceptibility to cognitive bias. One firm characteristic associated with cognitive bias is pricing uncertainty. A firm with lower pricing uncertainty, such as a Property Investment company, should present fewer opportunities for over-optimism than a more uncertain company, such as a Property Development company. The second objective of this paper is to determine the effect of pricing uncertainty on the long-run performance of equity issuers, while controlling for size, value and industry effects.

The special characteristics of Property Investment companies result in lower pricing uncertainty for Property Investment IPOs and RTs compared to other equities. Chapter 4 identified that when listing on the London Stock Exchange

Property Investment and Property Development firms are subject to special regulations, including the requirement that they present a valuation certificate for the properties they own. Chapter 5 discussed how Property Investment firms have the unique characteristic of being priced according to the value of their underlying property portfolio, which is facilitated in IPOs and rights issues because of the London Stock Exchange disclosure requirements. The final characteristic contributing to the low pricing uncertainty of Property Investment company equity issuers, is that Property Investment companies have relatively stable income from contract rents.

Focusing on the unique valuation process used for Property Investment companies Chapter 6 showed that Property Investment IPOs have lower pricing uncertainty than Property Development IPOs. It was found that Property Investment IPOs are priced near seasoned firms by the end of the first day, and have lower ex-post return volatility and specific risk than Property Development IPOs. Because of differences in pricing uncertainty, cognitive bias proponents would argue that both Property Investment IPOs and RTs provide fewer opportunities for overvaluation than Property Development IPOs and RTs. Thus they should perform better on average in the long-run. The following hypothesis results.

Hypothesis 2 : Pricing uncertainty and cognitive bias

Overvaluation of equity issuers at the issue date, resulting from cognitive bias, causes the underperformance of equity issuers. Firms with low pricing uncertainty are less susceptible to cognitive bias than firms with high pricing uncertainty, and are therefore less likely to be overvalued at the issue date. Thus low-pricing-uncertainty firms should perform better relative to non-issuers in the long-run than high-pricing-uncertainty firms. Property Investment companies have lower pricing uncertainty than Property Development companies. Thus Property Investment IPOs and RTs perform relatively better in the long-run than Property Development IPOs and RTs.

Chapter 6 also shows that on average Property Investment IPOs are priced efficiently at the close of the first trading day. Chapter 6 examined the DNAVs of Property Investment IPOs at the offer and closing prices during periods of differing market conditions. It was found that in premium sector DNAV markets, Property Investment IPOs are typically offered at a discount 9.38% larger than the average DNAV of firms in the sector. By the close of the first day Property Investment IPOs trade near the sector average DNAV. In discount markets there

is no significant difference between the firm's DNAV and the sector DNAV at the offer or closing price. This suggests that Property Investment IPOs are not overvalued in optimistic market conditions, and therefore should have long-run performance indistinguishable from that exhibited by similar non-issuing firms. Hypothesis 3 summarises this rationale.

Hypothesis 3 : Overvaluation and long-run performance
Overvaluation of equity issuers at the issue date, resulting from cognitive bias, causes the underperformance of equity issuers. Property Investment IPOs are priced at fair value in optimistic market conditions. Thus, Property Investment IPOs have normal long-run performance.

This chapter also considers the rights issue mechanism and whether the tendency for equity issues to bunch near market peaks is caused by firms deliberately timing issues to take advantage of over-optimistic new shareholders.[112] As discussed in Chapter 3, the cognitive bias explanation does not address the issue of whether firms know the extent of over-optimism and deliberately time their equity issues to take advantage of overvaluation (i.e overvaluation timing).

Chapter 3 introduced Affleck-Graves and Page's (1995) contention that rights issues remove the wealth transfer that arises from managers selling overpriced equity to new shareholders, and as a consequence, there is no incentive for managers to issue rights when the firm is overvalued. Any long-run underperformance for rights issuers is thus not a result of deliberate timing to take advantage of new shareholders.

The final contribution this chapter makes is to examine the performance of rights issues and IPOs from firms in the same industry matched by pricing uncertainty. If IPOs and RTs of Property Development companies have similar long-run performance then deliberate overvaluation timing would not appear necessary to explain either the hot issue markets or long-run underperformance anomalies. Similarly, if IPOs and RTs of Property Investment companies have similar long-

112 In the UK s89(1) of the Companies Act 1985 requires issues of new shares for cash (except where shareholders have consented) to be made by a rights offering. The listing rules of the London Stock Exchange define a rights issue as "..an offer to existing holders of securities of rights to subscribe or purchase further securities in proportion to their holdings..". Rights issues comprise the majority of seasoned equity offerings in the UK, in contrast to the US market where firm commitment contracts are used most often.

run performance timing to take advantage of new shareholders would be contradicted.

The empirical findings of this chapter can be summarised as follows: (i) Following an IPO or rights issue Property Investment companies perform indistinguishably from similar non-issuing firms. Thus new issue effects are not found in securitised real estate markets. (ii) Property Development companies significantly underperform similar non-issuing firms and perform relatively worse than Property Investment firm equity issuers. The difference in abnormal performance between the two firm types can be attributed to the influence of pricing uncertainty on long-run performance. (iii) Tests of the cognitive bias theory are weakly supportive of this explanation, while size and book-market effects are unable to account for the performance of Property Investment and Property Development firm equity issuers. (iv) The similar performance of rights issues and IPOs documented in this chapter suggests that timing equity issues to take advantage of new shareholders may not be linked directly to the existence of cognitive bias.

The remainder of the chapter is organised as follows: Research methodology and the data are described in section 2. The long-run performance of PIPOs and PRTs is presented in section 3. Section 3 also reports results showing the influence size and book/market effects have on performance, and examines timing effects and earnings patterns. Concluding comments and the implications of this research for investors in real estate securities are made in section 4.

2 METHODOLOGY AND SAMPLE

a. Sample

The IPO sample used in this chapter comprises the 63 Property Investment and Development companies included in the sample of Chapter 6, which have aftermarket total returns data available. As discussed in Chapter 6, the sample is taken from firms which listed between January 1980 and December 1994. 27

firms are categorised as Property Investment IPOs and 36 are defined as Property Development IPOs using the Rent-Earnings ratio defined in Chapter 6.

The rights issue sample consists of issues of ordinary shares undertaken by property companies between January 1984 and December 1994. This sample was taken from the 228 firms listed as property companies on Datastream files over the study period.[113] A total of 142 rights issues were identified, with several firms having multiple issues. Three issues were excluded because they did not involve ordinary shares and a further 30 were excluded because of various data unavailability reasons. Finally, 17 firms were excluded because classification data was unavailable. The final sample consists of 92 issues undertaken by 60 firms. 18 firms made two issues while seven firms made three issues. 19 of these subsequent issues occurred within 36 months of a previous issue.[114]

The PRT sample was classified according to the Rent-Earnings ratio at the balance date prior to the issue. A Property Development company is defined as having a Rent-Earnings ratio of less than 0.5. Property Investment firms are defined as having a Rent-Earnings ratio prior to listing of 0.5 or greater. 48 firms are categorised as Property Investment RTs and 44 are defined as Property Development RTs.

Data on share price, return and company accounts were derived from Datastream, the KPMG New Issue Statistics, the Investors Chronicle, Warburgs Property Sector Annual Reviews and from summaries of the individual offer prospectuses archived by Extel Financial Ltd.

Table 7.1 and Figure 7.1 show the distribution of the PIPO and PRT sample over the study period. A total of 155 PIPOs and PRTs are included in the sample, comprising 75 Property Investment company equity issues and 80 Property Development issues. From Figure 7.1 it can be seen that the issuing activity of

113 The 228 companies comprise the 135 alive companies and 92 dead companies listed with industry code 112 on the Datastream files over the study period.

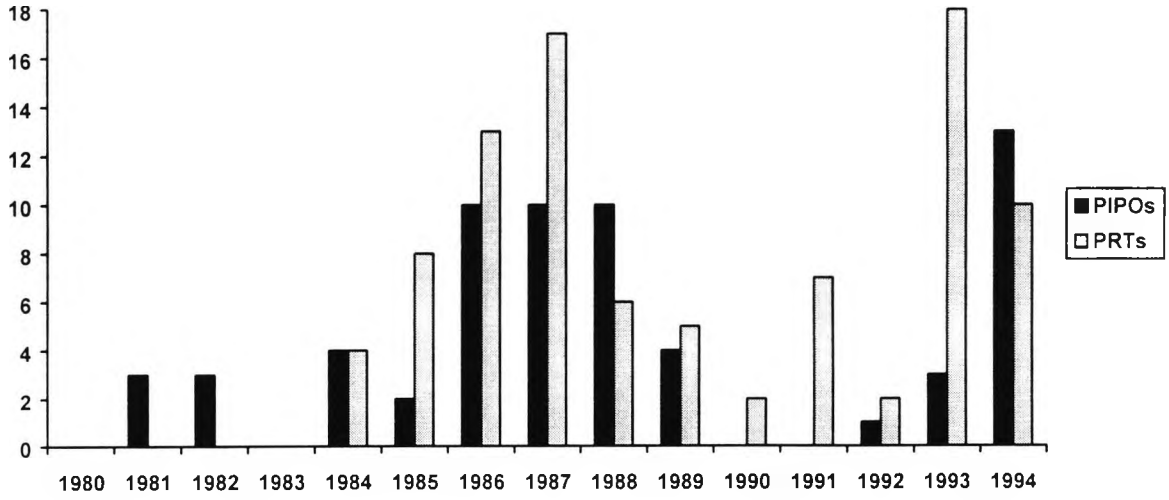
114 Speiss and Affleck-Graves (1995) show that inclusion of overlapping equity issues does not substantially alter long-run performance results whereas Levis (1995) shows it does. These issues are included on the basis that bias from including overlapping firms would underestimate long-run performance. Furthermore, an investor would have little knowledge of whether the firm will issue equity in the future when making an investment decision

Property Investment and Property Development RTs and IPOs varies similarly over time, with the most active periods being around 1987 and 1994.

Table 7.1 Property Investment and Development IPO and RT samples

Year	IPOs			RTs		
	Total Sample	Property Investment Sample	Property Development Sample	Total Sample	Property Investment Sample	Property Development Sample
1980	0	0	0			
1981	3	1	2			
1982	3	2	1			
1983	0	0	0			
1984	4	2	2	4	2	2
1985	2	0	2	8	2	6
1986	10	2	8	13	5	8
1987	10	1	9	17	6	11
1988	10	2	8	6	5	1
1989	4	2	2	5	3	2
1990	0	0	0	2	0	2
1991	0	0	0	7	4	3
1992	1	1	0	2	0	2
1993	3	3	0	18	13	5
1994	13	11	2	10	8	2
All	63	27	36	92	48	44

Figure 7.1 Property Investment and Development IPO and RT samples



b. Performance measurement

There is no standard approach to the measurement of long-run abnormal returns following firm specific events. Several methodological issues with long-run event studies have attracted attention in the finance literature. Kothari and Warner

(1996) summarise many of the issues raised by previous studies in their examination of the specification of long-run event studies. Long-run event studies focus on a test statistic: the ratio of the sample mean cumulative abnormal mean and its estimated standard deviation. Kothari and Warner (1996) argue that it is difficult to obtain unbiased estimates of the components of this ratio. They identify three main issues yet to be resolved. The first is the appropriate model to generate expected returns. Second, the properties of cumulative abnormal return variances or buy-hold return variances are not fully understood. Third, there are several problems with survival bias in most long-run studies.

Kothari and Warner (1996) find that long-run event studies are typically subject to some bias. In simulations on randomly selected firms test statistics based on cumulated abnormal returns and holding period returns overreject the null hypothesis of no abnormal performance. However, most of the over-rejection found by Kothari and Warner (1996) is found for positive abnormal returns. Negative long-run performance does not appear to be as mispecifed. The simulation results also suggest that the market adjusted model performs more reliably than the market model, CAPM or the Fama and French (1992) empirical CAPM.

In light of the criticism of long-horizon performance studies several methodologies have been adopted in this chapter to assess the performance of PIPOs and PRTs. The first step is to select a model to generate expected returns. The five models that are the most commonly employed for the calculation of abnormal returns are the: benchmark adjusted model, market adjusted model, market model, CAPM, and empirical CAPM. The equations for computation of abnormal returns using these models are presented below.

Benchmark adjusted	$ar_{it} = R_{it}-R_{bt}$	[a]
Market adjusted	$MAR_{it} = R_{it}-R_{mt}$	[b]
Market model	$MMAR_{it} = R_{it}-a_i-Bm_i\ R_{mt}$	[c]
CAPM	$CAPMAR_{it} = R_{it}-R_{ft}-B_i(R_{mt}-R_{ft})$	[d]
Empirical CAPM	$ECAPMAR_{it}=R_{it}-R_{ft}-B_{i1}(R_{mt}-R_{ft})-B_{i2}HML_t-B_{i3}SMB_t$	[e]

Where: R_{it} is the monthly return inclusive of dividends for firm i. R_{bt} is the monthly return on a chosen benchmark. R_{mt} is the return on an all share market index. a_i and Bm_i are market model coefficient estimates from regressing monthly returns on a market index over a pre-event estimation period. R_{ft} is usually the one month return on a short term government debt security used as a proxy for the risk free rate of return. (e.g T-bill). B_i is the CAPM beta coefficient: found by regressing $(R_{it}-R_{ft})$ on $(R_{mt}-R_{ft})$ for the pre-event period. HML is the high-minus-low book-market portfolio return in month t. SMB is the small-minus-big size portfolio return in month t. B_{i2} and B_{i3} are the sensitivity to the book-market (HML) and size (SMB) premia: found by regressing each security's monthly excess return on the market excess return, book-market and size factor returns for the pre-event period.

One of the aims of this study is to examine the performance of rights issues relative to IPOs, and therefore the same methodology should be used for both equity issue samples. As estimation of risk coefficients from pre-event data is not possible for IPO firms, the benchmark and market adjusted models appear the most appropriate methods of abnormal return calculation. Most of the large sample IPO long-run studies take a variety of benchmarks, including the market index and matching firms in an attempt to control for the risk of issuing firms. Although the extent of underperformance is sensitive to the benchmark adopted, whatever the benchmark, underperformance is generally reported.

There are several return measures used to assess the long-run performance of IPOs. The usual measures are equally weighted cumulative average monthly adjusted returns and holding period returns. Equally weighted average returns represent the result of a portfolio investment strategy of investing an equal nominal amount in every IPO. This is a reasonable assumption considering that post first day investment is the basis of long-run studies, and therefore rationing is not a limiting factor. However, value weighted returns representing proportional investment in each issue should probably be examined if some other size adjustment is not used.[115]

115 Loughran and Ritter (1993) undertook an analysis of value weighted returns They found that from a portfolio of 2221 IPOs valued collectively after the initial period at $122.16 billion (in 1991 dollars) underperformance (against matched

The approach adopted in this study is to use equal weighting and several benchmarks, including a size based index and special property related indices. Both cumulated and holding period returns are used, and care is taken to avoid survivorship bias. Continuously compounded monthly returns are calculated from Datastream files. Returns are based on prices at the last day of the month on which a share is traded, incorporate dividend payments and are adjusted for scrip and rights issues.[116]

For each PIPO the first partial month adjusted return [$\mathbf{ar_{i1}}$] is defined as the return from the offer price to the price on the last calendar day of the first month of seasoning [R_{i1}], less the benchmark return [R_{b1}]. The announcement month return for each PRT is the return from the price at the end of the day prior to the issue announcement to the price on the last calendar day of the first month following the announcement [R_{i1}], less the benchmark return [R_{b1}]. Between 1 and 30 calendar days are used to calculate these returns.

$$ar_{i1} = R_{i1} - R_{b1} \qquad [2]$$

The results presented in long-run performance studies are typically the equally weighted average adjusted percentage return from the post initial/announcement return interval until the three or five year anniversary for each issue in the sample. Three and five year time periods have become standard intervals to examine long-run performance but they do not appear to be the limit of underperformance. This study focuses on long-run performance over a three year period. The monthly excess return is defined below.

$$ar_{it} = R_{it} - R_{bt} \qquad [3]$$

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firms) of $34.21 billion resulted in the five year aftermarket. Loughran and Ritter (1993) report that the value weighted five year holding period raw return is 26.9%, substantially higher than the equally weighted return of 2.4%. This evidence has important implications for IPO investors. Firstly, the results show the vast magnitude of money which appears to be foregone by investing in IPOs in the long-run. This evidence also suggests that although a small issue effect is not the only basis of underperformance, it does appear to be a contributing factor.

116 Both Levis (1993) and Ritter (1991) use raw monthly returns in their long-run performance studies. In the UK, continuos compounded returns are more common because of the data sources available. In this study it is chosen to report continuous compounded returns to be consistent with later regression analyses and because it makes very little difference to the adjusted performance results.

We calculate average benchmark adjusted returns on the portfolio of **n** PIPOs/PRTs for month **t** as the equally weighted arithmetic average of the excess returns.

$$AR_t = \frac{1}{n}\sum_{i=1}^{n} ar_{it} \qquad [4]$$

The cumulative benchmark adjusted aftermarket performance, from the beginning of the first full month of seasoning to event month **g**, is the sum of the average excess returns.

$$CAR_{1,g} = \sum_{t=1}^{g} AR_t \qquad [5]$$

When a firm is delisted from the Datastream database, the PIPO portfolio return for the next month is an equally weighted average of the remaining firms in the portfolio. Thus estimation of the CARs involves monthly rebalancing.

The statistical significance of the CAR measure is assessed using the following formula: **n** is the number of firms in the cross-section, **t** is the event month, **var** is the average cross-sectional variance, and **cov** is the first-order auto-covariance of the $\mathbf{AR_t}$ series. This approach takes account of the lack of independence of the average return series.[117]

$$t(CAR_t) = \frac{CAR_t \cdot \sqrt{n}}{\sqrt{t \cdot (var + 2) \cdot (t - 1) \cdot cov}} \qquad [5a]$$

To obtain the most realistic comparison of returns we calculate buy and hold returns.[118] These returns measure the strategy of purchasing a PIPO or PRT share at the first day of the first full month following the listing (PIPOs) or announcement (PRTs), and holding until either delisting or the third anniversary. Where $\mathbf{R_{it}}$ is the raw return on firm **i** in event month **t**, the three year holding period returns for each firm are computed as;

117 Ritter (1991)

118 Differences between CARs and Holding Period returns have been noted in previous studies. The differences are partly due to the return computation methodology. For example, if a stock with a starting price of £10.00 declined half of its share price daily, after 7 days the price would be about 8 pence. The (multiplicative) Holding Period return for this period is truncated to 100%, while the raw (additive) cumulative return is -350%. For a critical review of the methods used for the computation of returns in long-run performance tests see Dissanaike (1994).

$$HR_i = \prod_{t=1}^{\min[36,delist]} (1 + R_{it}) - 1 \qquad [6]$$

Performance for a group of PIPOs or PRTs is measured by the arithmetic mean and median of the holding period returns, or by wealth relatives [**wr**]. A wealth relative of greater than 1.00 represents average outperformance by the PIPO or PRT portfolio relative to the benchmark. The wealth relatives for the mean and median holding period returns are defined below.

$$wr_{mean} = \frac{1 + \text{mean HP}_{PIPOs/PRTs}}{1 + \text{mean HP}_{Benchmark}} \qquad [7a]$$

$$wr_{median} = \frac{1 + \text{median HP}_{PIPOs/PRTs}}{1 + \text{median HP}_{Benchmark}} \qquad [7b]$$

To investigate the performance of firms which issued equity in differing market conditions PIPO and PRT issuers are pooled and divided into portfolios depending on the Warburgs SDNAV at the issue date. Using the same methodology adopted in Chapter 6, the sample is divided into groups depending on whether the Warburgs SDNAV was at a premium or discount at the time of issue. All firms with a Warburgs SDNAV of less than zero are in the Premium group, with the remainder being in the Discount group. In addition, two groups are also established based on whether the Warburgs SDNAV at the issue date is above or below the median firm's issue date Warburgs SDNAV. The Warburgs SDNAV at the issue date of the median firm in the full sample of 71 IPO firms is 13.70%, so all firms issued when the Warburgs SDNAV was less than this are in the Above Median group.

The portfolio average of mean monthly adjusted returns [$\mathbf{amar_n}$] is then computed. The mean of monthly adjusted returns is calculated for each firm from a maximum of 36 months post issue performance [**q**]. The mean of monthly adjusted returns [$\mathbf{mar_i}$] for each issue, and the portfolio average of this measure [$\mathbf{amar_n}$], are calculated below.

$$mar_i = \frac{1}{q} \sum_{t=1}^{q} ar_{it} \qquad [8]$$

$$amar_n = \frac{1}{n}\sum_{i=1}^{n} mar \qquad [9]$$

Consistent with previous studies excess returns are estimated with varying benchmarks. The benchmark commonly used for abnormal return studies in the UK is the Financial Times Actuaries All Share Index [FTA]. The FTA is a capitalisation weighted index which represents approximately 650 stocks and 90% of the capitalisation of the UK stock market. It is comparable to the S&P 500 index in the USA.

For measuring the performance of smaller firms in the UK a more appropriate benchmark is the Hoare Govett 1000. The Hoare Govett 1000 is a capitalisation weighted index comprising the 1000 smallest firms (including investment trusts) in the UK equity market.[119] The market value of the index is approximately £14bn, representing 2% of the total UK market capitalisation. The average market capitalisation is £18m, which is similar to the median size of firms undertaking PIPOs in the sample.

The arbitrage pricing principle suggests that securitised real estate prices will be strongly related to the total value of the real estate contained in the firms portfolio. Because of this pricing mechanism, and the tendency for property asset prices to have relatively low covariance with market indices, three special real estate related indices are included as benchmarks: (i) a portfolio of non-issuing securitised real estate firms, (ii) an index comprising only property company shares, and (iii) a direct real estate performance index.

First a comparison of the performance of the sample against the Financial Times Actuaries Property Share Index [FTA Prop] is conducted. The FTA Prop is a capitalisation weighted index which represents approximately 39 stocks and 2% of the UK stock market's capitalisation. This index contains the largest stocks in the sector and is mainly comprised of Property Investment firms. Although the PIPO sample is not identical to the constituents of FTA Prop, a large proportion of the PRT sample appears in the sector index.

To achieve an explicit estimate of the differences in returns from equity issuers and non-equity issuers two benchmark portfolios are formed: (i) non-issuing Property Investment companies, and (ii) non-issuing Property Development companies. The initial task in constructing these non-issuing firm benchmarks was to form portfolios of Property Development and Property Investment firms which were present in the sector over the period 1980-1995. The categorisation of firms was performed annually based on the Rent-Earnings ratio, using data published in the final accounts and recorded on Datastream files. Once again dead firms were included from the Datastream list, to eliminate survivorship bias, and a Rent-Earnings ratio of 0.5 or greater was adopted to identify Property Investment firms.

To compare the performance of PIPOs and PRTs with the performance of direct real estate several possible benchmarks exist. There are 11 major published measures of total return for the UK real estate market. The main indices differ considerably in their composition, the methods used to calculate performance, and their results. Most of the indices are based on actual properties which are owned by institutional investors. These indices reflect actual leasing agreements in place and are affected by both depreciation and active portfolio management.[120]

For present purposes the Jones Lang Wootten [JLW] valuation based total return index was chosen, primarily because of the length of this series. As at the beginning of 1995 the index comprises 199 properties with a combined market value of approximately £550 million. The portfolio is distributed throughout the UK geographic regions and property sectors. Approximately 48% of the value of the index is categorised as office property, 32% as retail and 19% as industrial. Because the index is published quarterly we recalculate monthly continuous compounded returns.[121]

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119 The Hoare Govett 1000 index is rebalanced annually.

120 A review of the problems of using these real estate indices to measure performance is contained in Brown and Matysiak (1995). A consideration in any real estate performance study is that smoothing and long term memory likely to be found in direct real estate indices. Because the performance comparison between PIPOs/PRTs and direct real estate is based on mean return measures, unadjusted for smoothed variance (for example using the Blundell and Ward (1987) formulation), the interpretation of t-statistics for the JLW adjusted series is tentative.

121 The use of the JLW benchmark implies that an investor could purchase either a derivative security which matches the index, or additional real estate investments for a standing real estate portfolio. When comparing the performance of PIPOs and PRTs against the direct real estate market gearing is an important consideration. By adoption of the JLW index we are

3 EMPIRICAL RESULTS

a. Cumulated average benchmark adjusted and Holding Period returns

Tables 7.2a and 7.2b present the Property Development and Investment company CARs (equation [5]), excluding first partial month returns, for the first 36 months following a PIPO or announcement of a PRT. The results of both the PIPO and PRT samples are shown separately for Non-Issuer, Property Share, All Share, Small Firm and the Direct Property adjusted returns. As found in previous studies measuring IPO and SEO performance, the magnitude of the adjusted performance of the Property Development and Property Investment firm equity issuers is sensitive to the benchmark employed.

The Property Development IPO CAR series (Table 7.2a) show a steep decline from month 12 to month 36. Excluding the first month, returns fall to -38.74% (Non-Issuing Property Development Portfolio) -53.69% (Property Share), -59.71% (Direct Property), -64.92% (Small Firm) and -72.26% (All Share) by the end of the third year. Property Development IPOs exhibit the same tendency as other operating firms to perform similar to benchmarks over the first twelve months and then decline. However, Property Development IPO underperformance exhibits considerably more economic significance. The results are greater than four times the -11.38% (FT All Share) reported average for UK IPOs by Levis (1993).[122]

Following a rights issue Property Development firms also underperform. However the magnitude of seasoned issuer's underperformance is less economically significant than that exhibited by Property Development IPOs. In Table 7.3b Property Development RT CARs fall to -41.20% (Non-Issuing Property Development portfolio) -35.74% (Property Share), -36.50% (Direct

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comparing holding a real estate portfolio with no gearing at the corporate level against PIPOs and PRTs which may be highly geared.

122 The poor performance of Property Development IPOs relative to the market, small firms, and the direct property index appears to reflect not only the poor performance of new issuing Property Development firms but also the typically poor performance of all Property Development firms. This may be a consequence of Property Development firms operating in the extremely overbuilt UK property markets during the early 1990's. However, if this were the case we would expect Property Development RTs to show similar poor performance, and the non-property benchmark results for these issuers do not confirm this.

Property),-43.81% (Small Firm) and -44.77% (All Share) by the end of the third year.

While Property Development equity issuers appear to be poor investments, the results indicate that Property Investment equity issuers perform considerably better. Property Investment IPO CARs (Table 7.3a) decline at a much slower rate and from later in seasoning than Property Development IPO CARs. Excluding the first month they fall to -20.92% (Non-Issuing Property Investment portfolio), -18.66% (Property Share), -12.42% (Direct Property), -35.07% (Small Firm) and -47.61% (All Share), by the end of the third year. While still indicating underperformance, only the FTA series is statistically significant at the 90% level or greater.

Property Investment RTs are also found to perform relatively better than Property Development RTs. Compared with Non-Issuing firms, Property Investment RT firms underperform by half the magnitude (-21.18%) of Property Development RT firms. The negative 36 month CARs reported in Table 7.3b for Property Investment RTs are all insignificant except for the All Share series. Thus there is little conclusive evidence from the CAR analysis to suggest that investors should be wary of securitised real estate IPOs or rights issues.

Although there would appear no motive for managers to time rights issues for overvaluation, PRT and PIPO long-run performance is similar. Property Investment firm RTs and IPOs both perform similarly to non-issuing firms while Property Development RTs and IPOs both underperform non-issuers significantly. The underperformance of rights issues of Property Development companies is consistent with the findings of Affleck-Graves and Page (1995). These results suggest that the desire to maximise existing shareholder wealth at the expense of outsiders does not necessarily underly the new issue underperformance effect.

As our analysis includes PIPOs and PRTs which occurred up until December 1994, and our return analysis ends in September 1995, those firms issuing equity after September 1992 do not have a 36 month period for performance comparison. As equity issuers generally perform better over the first 18 months, and Property

Investment firms tended to issue between September 1992 and 1995, this is a possible methodological reason for the observed performance difference between Property Development and Investment firms. However using only firms which have 36 month post issue returns available does not substantially alter the results for Property Investment IPOs or RTs. For example, Non-Issuing CARs for Property Investment IPOs are -16.57% (t-value 0.59) after 36 months. Similarly Property Investment RTs with at least 36 months of performance have Non-Issuing CARs of -23.74% (t-value -1.44).

To check the persistence of the performance patterns of Property Development and Property Investment firms following equity issues the performance analyses are extended out to 60 months. The results from the extended analyses are presented in Appendix 7A. Although the sample sizes are too small to be 100% confident of the 60 month CARs, the findings are interesting: (i) Property Investment firms continue to perform better than Property Development firms after five years, (ii) Property Investment firms continue to have insignificant CARs, and in fact CARs become positive for some benchmarks. (iii) Property Development issuers steadily continue to underperform after three years.

To illustrate the difference in the performance of Property Development and Property Investment equity issuers the Non-Issuing firm CARs are shown graphically for the 36 month period. Figure 7.2a presents the benchmark CARs for Property Investment and Property Development IPOs including the initial partial month performance. Figure 7.2b presents the Non-Issuing firm CARs for Property Investment and Property Development RTs including the announcement month performance. From these figures it can be seen that Property Development firms have more positive initial partial month returns following a IPO and more negative partial month returns following the announcement of a rights issue than Property Investment equity issuers. Inclusion of the average positive return found in the listing month increases the CARs of both Property Development and Property Investment IPOs. The downward drift of Property Development firm CARs relative to Property Investment firm CARs is clearly visible in the two figures.

Table 7.2a CARs of Property Investment and Property Development IPOs

t	Sample	NON-ISSUERS [Portfolio matched by industry and activity]		PROPERTY SHARES [FT Property]		DIRECT PROPERTY [JLW/IPD]		SMALL FIRMS [HG1000]		ALL SHARES [FT All Share]	
	Inv~Development	Inv CAR% t-stat	Dev CAR% t-stat	Inv CAR% t-stat	Dev CAR% t-stat	Inv CAR% t-stat	Dev CAR% t-stat	Inv CAR% t-stat	Dev CAR% t-stat	Inv CAR% t-stat	Dev CAR% t-stat
3	27~36	1.77 0.36	8.04 1.53	-0.08 (0.02)	4.73 1.07	0.59 0.13	6.12 1.29	-0.71 (0.09)	4.58 0.86	-2.24 (0.50)	4.00 0.90
6	27~36	7.18 1.03	2.06 0.28	4.04 0.64	5.00 0.80	5.46 0.79	5.03 0.75	0.47 0.04	2.82 0.38	-1.77 (0.28)	4.39 0.69
9	27~35	-0.91 (0.11)	8.40 0.91	-2.74 (0.35)	7.86 1.01	-3.54 (0.40)	12.31 1.47	-8.64 (0.62)	2.83 0.31	-11.17 (1.43)	7.56 0.96
12	25~34	-0.71 (0.07)	17.93 1.65	-0.78 (0.08)	11.80 1.30	-0.58 (0.06)	17.47 1.78*	-9.33 (0.56)	5.64 0.52	-11.24 (1.20)	11.05 1.20
15	23~34	-1.44 (0.12)	6.02 0.50	-0.07 (0.01)	2.10 0.21	2.23 0.20	4.05 0.37	-7.79 (0.40)	-8.82 (0.73)	-11.76 (1.08)	0.15 0.01
18	19~34	-2.69 (0.19)	-4.27 (0.32)	-2.51 (0.19)	-9.53 (0.86)	2.36 0.17	-6.91 (0.58)	-9.83 (0.42)	-20.64 (1.56)	-16.30 (1.24)	-11.89 (1.05)
21	16~33	-8.05 (0.47)	-11.49 (0.79)	-7.17 (0.47)	-17.99 (1.47)	-4.04 (0.25)	-16.98 (1.29)	-18.98 (0.69)	-27.90 (1.92)*	-23.49 (1.52)	-22.61 (1.83)*
24	12~33	-14.21 (0.68)	-17.49 (1.12)	-11.91 (0.63)	-27.90 (2.14)**	-9.59 (0.48)	-27.49 (1.96)*	-23.91 (0.70)	-37.76 (2.43)**	-29.65 (1.55)	-33.56 (2.54)**
27	12~31	-11.76 (0.53)	-23.73 (1.39)	-11.26 (0.56)	-37.58 (2.63)**	-4.24 (0.20)	-38.09 (2.48)**	-20.13 (0.56)	-48.95 (2.86)**	-30.75 (1.52)	-45.70 (3.16)**
30	11~29	-16.78 (0.69)	-28.37 (1.52)	-9.15 (0.41)	-39.83 (2.56)**	-4.64 (0.20)	-44.33 (2.64)**	-20.81 (0.52)	-53.50 (2.85)**	-32.07 (1.44)	-51.01 (3.23)**
33	11~28	-27.62 (1.08)	-35.33 (1.78)*	-15.74 (0.68)	-51.36 (3.09)**	-10.21 (0.42)	-56.01 (3.13)**	-29.52 (0.71)	-65.20 (3.24)**	-41.89 (1.79)	-66.46 (3.95)**
36	11~27	-20.92 (0.78)	-38.74 (1.83)*	-18.66 (0.77)	-53.69 (3.04)**	-12.42 (0.49)	-59.71 (3.14)**	-35.07 (0.80)	-64.92 (3.02)**	-47.61 (1.95)*	-72.26 (4.03)**

Notes: Table 7.2a excludes first partial month adjusted returns. CARs are calculated from equation [5]. t-statistics under CARs are calculated from equation [5a]. ** 95% significance for two tail test, * 90% significance for two tail test.

Figure 7.2a CARs (incl initial returns) for Property Investment and Development IPOs

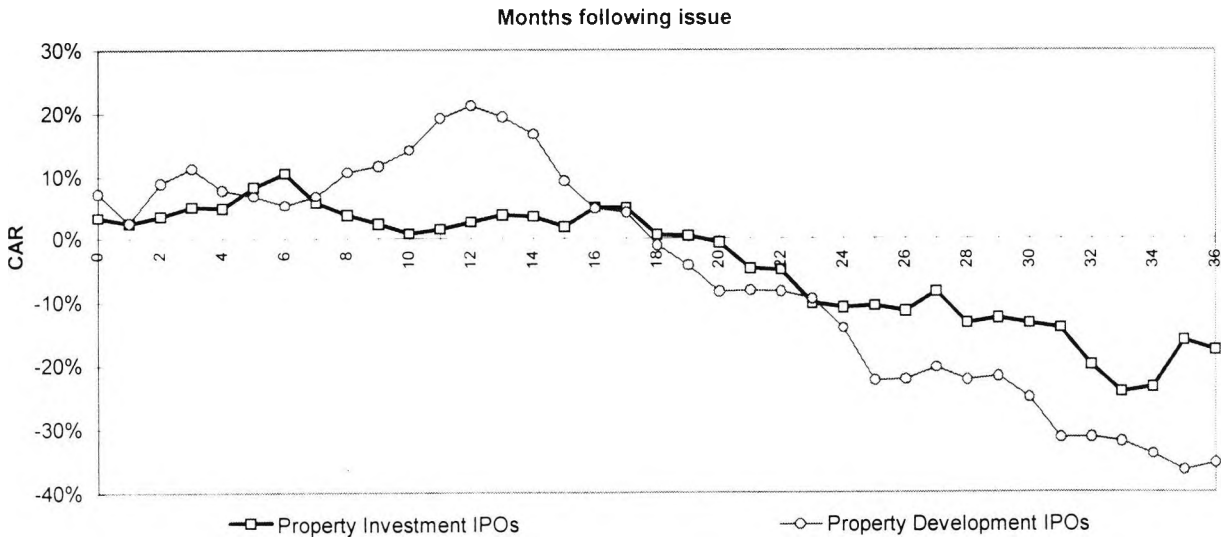


Table 7.2b CARs of Property Investment and Property Development RTs

t	Sample	NON-ISSUERS [Portfolio matched by industry and activity]		PROPERTY SHARES [FT Property]		DIRECT PROPERTY [JLW]		SMALL FIRMS [HG1000]		ALL SHARES [FT All Share]	
	Inv~Development	Inv	Dev	Inv	Dev	Inv	Dev	Inv	Dev	Inv	Dev
		CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat
3	48~44	3.98 1.18	-0.02 (0.00)	1.48 0.53	0.21 0.05	1.78 0.59	1.74 0.38	-0.77 (0.17)	-1.10 (0.24)	1.59 0.55	0.37 0.09
6	48~44	0.15 0.03	-5.27 (0.71)	-1.24 (0.31)	0.36 0.06	-1.42 (0.33)	-0.33 (0.05)	1.51 0.23	-4.16 (0.66)	-2.65 (0.65)	0.30 0.05
9	48~44	-1.81 (0.31)	-6.51 (0.71)	-1.55 (0.32)	-1.06 (0.15)	-4.96 (0.94)	1.12 0.14	-7.07 (0.88)	-6.78 (0.87)	-6.26 (1.26)	-1.69 (0.24)
12	48~43	-3.07 (0.46)	-13.11 (1.23)	-0.90 (0.16)	-7.09 (0.88)	-5.83 (0.96)	-2.78 (0.30)	-8.24 (0.86)	-13.85 (1.53)	-8.03 (1.40)	-6.53 (0.79)
15	45~43	-8.76 (1.13)	-15.46 (1.30)	-4.95 (0.76)	-9.87 (1.09)	-7.72 (1.10)	-7.24 (0.69)	-8.53 (0.76)	-17.13 (1.69) *	-14.05 (2.12) **	-11.43 (1.23)
18	42~43	-9.88 (1.12)	-26.48 (2.03) **	-7.02 (0.95)	-17.43 (1.76)	-7.90 (0.99)	-14.62 (1.28)	-11.73 (0.87)	-26.07 (2.35) **	-18.45 (2.46) **	-18.60 (1.83)
21	40~42	-11.81 (1.21)	-23.06 (1.62)	-6.15 (0.76)	-12.28 (1.14)	-8.19 (0.93)	-7.52 (0.60)	-19.78 (1.25)	-22.63 (1.86) *	-19.47 (2.34) **	-14.88 (1.34)
24	36~39	-9.47 (0.86)	-30.82 (1.95)*	-6.43 (0.70)	-20.01 (1.67)	-5.02 (0.51)	-14.87 (1.07)	-24.88 (1.27)	-30.73 (2.28) **	-18.71 (2.00) **	-22.68 (1.84) *
27	33~37	-12.44 (1.02)	-26.97 (1.57)	-8.78 (0.86)	-21.61 (1.65)	-9.14 (0.83)	-15.24 (1.01)	-23.24 (1.12)	-29.41 (2.01) **	-23.71 (2.29) **	-25.43 (1.89) *
30	27~37	-10.21 (0.72)	-37.03 (2.04) **	-7.46 (0.63)	-26.46 (1.92) *	-8.04 (0.63)	-24.44 (1.54)	-26.75 (1.17)	-36.09 (2.33) **	-24.74 (2.05) **	-31.35 (2.21) **
33	27~37	-11.84 (0.79)	-32.06 (1.68) *	-9.16 (0.74)	-28.52 (1.97) *	-12.62 (0.94)	-26.46 (1.59)	-36.93 (1.54)	-35.45 (2.19) **	-29.69 (2.34) **	-35.92 (2.42) **
36	24~26	-21.18 (1.28)	-41.20 (1.74) *	-15.61 (1.13)	-35.74 (1.98) *	-25.01 (1.68)	-36.50 (1.76) *	-39.22 (1.56)	-43.81 (2.17) **	-40.59 (2.89) **	-44.77 (2.42) **

Notes: Table 7.2b excludes announcement month adjusted returns. CARs are calculated from equation [5]. t-statistics under CARs are calculated from equation [5a]. ** 95% significance for two tail test, * 90% significance for two tail test.

Figure 7.2b CARs (incl announcement) for Property Investment and Development RTs

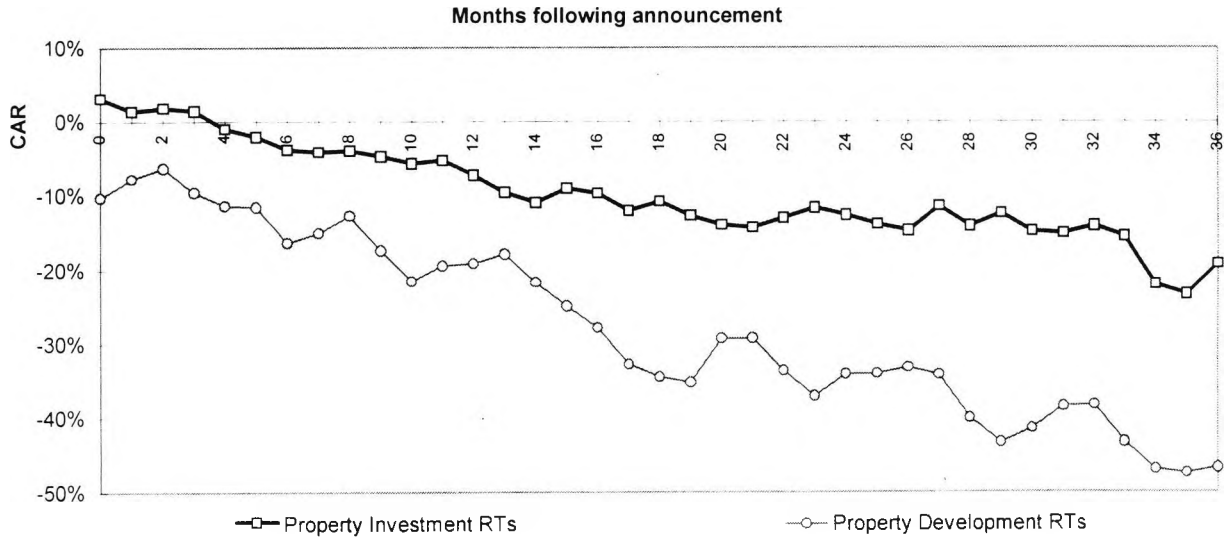


Table 7.3 reports the mean and median 36 month Holding Period returns (equation [6]) for Property Development and Property Investment IPOs and RTs. Alongside the PIPO and PRT returns are the returns from investments in the: Non-Issuing firm, Direct Property, Property Share, the All Share, and Small Firm benchmarks, undertaken at the same time as each PIPO or after announcement of each PRT. The results obtained reflect a strategy of investing an equal monetary amount in every PIPO/PRT or benchmark alternative. Also reported in Table 7.4 are both the 36 month mean and median wealth relatives (equations [7a] and [7b]), which compare investments in portfolios of Property Development and Property Investment IPOs or RTs with the benchmark alternatives.

It is methodologically relevant to mention here that the sample size used to compute the Holding Period returns is always less than the total samples because of the effects of delistings prior to the third anniversary, and truncation of the return series at September 1995. The reported 36 month returns are actually a composite of up to 36 months performance for each PIPO/PRT and benchmark.

The mean wealth relatives for the Property Development IPOs, reported in Panel B of Table 7.4, are in the range of 0.79-0.92, depending on chosen benchmark. This is near the average matching firm wealth relatives reported by Ritter (1991) (0.83 IPOs) and Loughran and Ritter (1995a) (0.80 IPOs 0.78 SEOs). This range is also comparable to the range of wealth relatives reported for UK IPO portfolios by Levis (1993).

The Property Development IPO median wealth relatives are substantially lower than mean wealth relatives indicating a few high performing Property Development firms may be influencing the results. The 0.44-0.66 range reported in Panel D for the median and mean wealth relatives of Property Development RTs does not indicate outliers are driving the RT results. Property Development RTs perform consistently worse than the benchmarks and relatively worse than Property Investment RTs.

The wealth relatives found for the Property Investment PIPO and RT samples generally confirm the relatively stronger performance of Property Investment

issuers compared to Property Development issuers. In Panel A of Table 4 the mean wealth relatives for both Direct Property (0.96) and Property Shares (0.90) suggest that the performance of Property Investment IPOs is similar to these benchmarks. Property Investment RTs have mean wealth relatives in the range of 0.77-0.92; again indicating underperformance yet not to the same degree as Property Development RTs.[123]

Both the CAR and Holding Period return results cannot confirm the presence of new issue underperformance in securitized real estate markets. Property Investment IPOs and RTs are found to perform worse on average than non-issuing firms. However, the level of underperformance exhibited is not great enough to be statistically different from our null hypothesis of normal performance. Thus this study provides no conclusive results which suggest investors should avoid securitised real estate equity issues. Relative to Property Development equity issuers, which are firms operating in the same industry but without standing real estate portfolios, Property Investment equity issuers have performed relatively better. These findings are consistent with a negative relationship between pricing uncertainty and long-run performance. We next examine in greater detail how robust the findings are, and the explanations of new issue performance.

123 Similar to the CAR results, extending the holding period analysis to 60 months (results not reported) shows that Property Investment equity issuers continue to do better than Property Development issuers after three years.

Table 7.3 Property Investment and Development IPO&RT Holding Period returns

	Portfolio	NON-ISSUERS [Matched Portfolio]	PROPERTY SHARES [FT Property]	DIRECT PROPERTY [JLW]	SMALL FIRMS [HG1000]	ALL SHARES [FT All Share]
Panel A	**Property Investment IPOs**					
Mean	4.2%	24.9%	16.3%	8.6%	40.4%	39.5%
Median	0.3%	-1.9%	-2.0%	-1.6%	12.4%	19.9%
Wealth Relative Avg		**0.83**	**0.90**	**0.96**	**0.74**	**0.75**
Wealth Relative Med		**1.02**	**1.02**	**1.02**	**0.89**	**0.84**
Panel B	**Property Development IPOs**					
Mean	9.8%	33.1%	22.8%	38.2%	33.4%	39.1%
Median	-48.5%	-14.8%	5.3%	43.1%	-12.8%	36.6%
Wealth Relative Avg		**0.82**	**0.89**	**0.79**	**0.82**	**0.79**
Wealth Relative Med		**0.60**	**0.49**	**0.36**	**0.59**	**0.38**
Panel C	**Property Investment RTs**					
Mean	-0.1%	22.9%	8.2%	17.5%	29.1%	29.5%
Median	-5.5%	-1.2%	-0.6%	10.6%	16.2%	28.4%
Wealth Relative Avg		**0.81**	**0.92**	**0.85**	**0.77**	**0.77**
Wealth Relative Med		**0.96**	**0.95**	**0.85**	**0.81**	**0.74**
Panel D	**Property Development RTs**					
Mean	-18.7%	39.1%	22.5%	36.9%	44.7%	32.1%
Median	-33.4%	18.6%	13.6%	40.1%	51.7%	35.9%
Wealth Relative Avg		**0.58**	**0.66**	**0.59**	**0.56**	**0.62**
Wealth Relative Med		**0.56**	**0.59**	**0.48**	**0.44**	**0.49**

Notes: Table 7.3 excludes first partial month and announcement adjusted returns. Holding Period returns are calculated from equation [6].

b. The impact of size and value effects on long-run performance

In the US REIT market there is evidence documenting size and value effects in share performance. For example, McIntosh, Ling and Tompkins (1991) and Liu and Mei (1992) both find a small firm effect within the REIT industry. Goebel and Ma (1993) find accounting variables; net asset value, earnings, dividends, and the book value of equity are significant factors in explaining REIT returns. The existence of size and

value effects is a possible explanation for the new issue effects found in this study for PRTs and PIPOs. This section investigates the effect of size and book-market characteristics on the performance of Property Investment and Development IPOs and RTs. An additional goal is to shed some light on the insignificant results obtained for Property Investment new issuers by using a different methodology.

The methodology adopted to test for size and value effects is in the spirit of Fama and MacBeth (1973) and is similar to that used in Loughran and Ritter (1995a). Monthly cross-sectional regressions are estimated on the entire population of property companies listed on the London Stock Exchange during the period 1984-1994, for which we have book-market ratios. The number of firms included in the cross-sections varies between 77 firms in 1984 and 106 firms in 1994.[124]

Dummy variables are used to test for differences in the performance of Property Development and Property Investment new issues. The Property Development dummy variable takes a value of 1 if a firm is identified as a Property Development firm that went public or issued rights during the preceding 3 years. The Property Investment dummy variable takes a value of 1 if a firm is identified as a Property Investment firm that went public or issued rights during the preceding 3 years. The natural logarithm of the book-market ratio and the natural logarithm of market capitalisation are the remaining independent variables.[125]

The unrestricted log-linear equations estimated by OLS procedures are given in equation [10]. Given the insights provided by theory and previous empirical results, it is expected that $B_0>0$, $B_1<0$, $B_2>0$, $B_3<0$ and $B_4=0$.

$$\mathbf{r_{it} = B_0 + B_1 \ln(MV)_{it} + B_2 \ln(B/M)_{it} + B_3 D_i + B_4 I_i + e_i} \qquad [10]$$

where :

$\mathbf{r_{it}}$ = Raw return for firm **i** at time **t**
$\mathbf{B_0}$ = Constant

124 Survivorship bias is eliminated in the procedure by including all "dead" property companies in the sample from Datastreams' dead companies file. The period for this analysis begins at 1984 in order to include both PIPO and PRT issuers. The period is truncated at 1994 because many 1995 book values are unobtainable at the date of undertaking the analysis.
125 Both the book-market ratio and market capitalisation are calculated annually for each stock on June 30.

$\mathbf{MV}_{it}$ = Market capitalisation
$\mathbf{B/M}_{it}$ = Book-market ratio
$\mathbf{D}_i$ = Property Development IPO and RT dummy
$\mathbf{I}_i$ = Property Investment IPO and RT dummy
$\mathbf{e}_i$ = Residual error

The means of the coefficients in the 132 unrestricted regressions are presented in the first row of Table 7.4. Below the mean coefficients are t-values calculated using the standard deviation of the 132 coefficient estimates. The average book-market coefficient is positive but statistically indistinguishable from zero. The average coefficient for the size variable is positive and significantly different from zero at the 95% level. This result suggests that on average a positive size effect existed in the UK securitised real estate market over the ten year study period.

Including control variables for size and book-market, the average coefficient for the Property Investment IPO and RT dummy variable is negative and statistically insignificant. This indicates that even after taking size and value effects into account, Property Investment firm equity issuers exhibit performance indistinguishable from non-issuers.

In contrast to Property Investment firms, the average dummy coefficient for Property Development firm equity issuers is negative and significant, after controlling for size and book-market effects. The average coefficient of -0.014996 for the Property Development firm dummy variable indicates that these firms underperform on average by 1.50 percentage points per month. Over the first three years of seasoning this equates to -41.95% against non-issuing property companies, in line with the performance found in CARs and holding period returns.

To estimate the extent to which size and book-market effects can explain the Property Development and Property Investment dummy variable results, the regression equation is estimated with only the new issue dummy variables. The Property Investment dummy variable is insignificantly positive without controlling for size and value; again indicating no underperformance effect in securitised real estate markets. The Property Development dummy mean coefficient reduces from -0.014996 in the

unrestricted model to -0.014329 in this model; indicating size and value effects do not cause the underperformance of these firms. The regression results suggest that book-market and size effects cannot account for the performance of Property Development or Property Investment firms following equity issues. In fact the reduction in the mean coefficients for the size and book-market variables from the restricted to the unrestricted model indicates that the new issue effect may be in part responsible for size and value effects.[126] The next section examines the variation in underperformance over intervals determined by market conditions and issuing activity.

Table 7.4 Property company size and book/market regression results 1984-1994

Model	B_0 Constant	B_1 lnMV	B_2 lnB/M	B_3 Property Development Dummy	B_4 Property Investment Dummy	Mean Adjusted R^2
All Variables	-0.004637	0.002184	0.002601	-0.014996	-0.000167	0.05
t-value	-0.75	1.96**	0.94	-2.72**	-0.05	
Issue Dummies Only	0.002848			-0.014329	0.00099	0.01
t-value	0.53			-2.40**	0.26	
Size and Book-Market	-0.007564	0.002605	0.003437			0.04
t-value	-1.20	2.35**	1.19			

Notes: Table 7.4 presents mean coefficient estimates from 132 monthly cross-sectional regressions for the unrestricted and restricted equation [10]. t-values below mean coefficients are calculated from the standard deviation of the coefficient estimates. ** 95% significance for two tail test, * 90% significance for two tail test.

c. The effect of issuing activity and market conditions on underperformance

If heavy issue volume occurs because firms deliberately attempt to raise equity in periods of investor over-optimism (i.e overvaluation timing), issues timed for heavy activity periods should perform worse than issues originating in light periods. In

126 While the cross-sectional analysis supports the CAR and Holding Period performance results, in order to leave no doubt as to robustness of the findings a time-series analysis similar to that of Fama, Booth and Sinquefield (1993) has also been undertaken. The time-series results (not reported) again suggest underperformance for Property Development equity issuers and normal performance for Property Investment equity issuers.

Chapter 2 the mixed results for the relationship between issue activity and long-run performance was discussed. Loughran and Ritter (1995a) find evidence supporting a negative relationship between long-run performance and issue activity, whereas Ljungqvist (1995) and others do not. To check the results of Table 7.4, and to test the robustness of the suggested link between issue volume and underperformance, the mean regression coefficients of periods following light and heavy issuance activity are examined.

Panel A of Table 7.5 reports the mean coefficients for a period (1/84-6/86) where there previously had been light issuance activity from Property Development and Investment firms. The overvaluation timing theory predicts that the worst long-run performance will be found in period B, which follows the hot issue markets between 1986 and 1988. In period C the fourth and fifth year of seasoning from the hot market issues during 1988 and 1987 are combined with the early seasoning years of issues from the light 1990-1992 period. Finally, in Period D, Property Development equity issues have originated from light periods whilst Property Investment equity issues occurred mainly in the hot issue market of 1993 and 1994.

The results obtained for Property Development equity issuers are weakly consistent with greater underperformance following heavy activity periods. Property Development issuers exhibit significant underperformance in both Periods B and C, which follow higher activity. Of these two periods the greatest underperformance would be expected to occur in Period B; however, Period C has the largest underperformance. The nil reaction by Property Investment equity issuers over all periods further supports the conclusion that new issue effects are considerably reduced in securitized real estate firms.

Table 7.5 Property Co performance following light and heavy issuance periods

Period	B_0 Constant	B_1 lnMV	B_2 lnB/M	B_3 Property Development	B_4 Property Investment	Mean Adjusted R^2	Number of Months
A. 1/84-6/86 **Cool**	0.020	-0.001	0.002	0.003	-0.011	0.043	30
t-value	3.02**	-0.55	0.35	0.57	-1.5		
B. 7/86-6/91 **Hot**	-0.016	0.004	0.008	-0.011	0.002	0.047	60
t-value	-1.44	2.17**	1.64	-1.97*	0.29		
C. 7/91-6/93 **Mixed**	-0.007	0.002	-0.004	-0.051	0.005	0.051	24
t-value	-0.46	0.74	-0.79	-2.20**	0.58		
D. 7/93-12/94 **Hot Inv/Cool Dev**	-0.006	0.002	-0.004	-0.011	0.004	0.077	18
t-value	-0.47	0.62	-1.40	-0.83	0.87		

Notes: Table 7.5 presents mean coefficient estimates from monthly cross-sectional regressions for the unrestricted equation [10] over periods following varying issue activity. T-statistics below mean coefficients are calculated from the standard deviation of the coefficient estimates., ** 95% significance for two tail test, * 90% significance for two tail test.

An implication of the cognitive bias hypothesis is that firms issuing in market conditions where over-optimism is strongest should exhibit the worst long-run performance. Market conditions for UK property companies are usually defined according to the SDNAV. If the pricing uncertainty of Property Development firms presents more opportunities for overvaluation, we would expect optimistic conditions at the issue date to be negatively related to long-run performance. If Property Investment companies present fewer opportunities for overvaluation, we would expect market conditions at the issue date to have a lesser influence on long-run performance. Moreover, the results of Chapter 6 suggest Property Investment IPOs are not overvalued at all in optimistic market conditions. If both Property Investment IPOs and Property Investment RTs are priced efficiently we would not expect to find Non-Issuing firm adjusted performance for these firms to vary depending on whether market conditions are optimistic at the issue date.

Table 7.6 reports the arithmetic average of mean monthly Non-Issuing benchmark adjusted returns (equation [9]) for portfolios of Property Investment and Property

Development equity issuers formed on the basis of the Warburgs SDNAV. The results of combining the Property Investment IPO and RT samples and examining average monthly performance again indicates normal long-run performance for securitised real estate equity issuers. Property Investment equity issuers are found to exhibit average underperformance which is statistically insignificant in Premium, Discount, Above Median or Below Median markets. Only 56% of equity issues by Property Investment companies subsequently underperform over the next three years.

Property Development equity issuers are once again associated with a level of underperformance (average of mean monthly adjusted returns -1.66%) which is statistically significant. 74% of the firms issued in Premium market conditions have negative mean monthly adjusted returns while 67% of firms issued in discount markets underperform. The average performance for Property Development equity issuers in Premium markets is statistically indistinguishable from the average performance of Discount market issuers. However the difference between Below Median (-1.20%) and Above Median (-2.27%) equity issuers is significant.

The results reported in Tables 7.5 and 7.6 confirm that there are significant differences between the post-issue performance of Property Investment and Property Development equity issuers. Property Investment equity issuers perform indistinguishably from non-issuers irrespective of issue activity or market conditions at the issue date. The performance of Property Investment firms is consistent with the predictions of the cognitive bias theory for firms with certain pricing. The performance of Property Development firms is consistent with some of the predictions of the cognitive bias and overvaluation timing theories for firms with relatively uncertain pricing.

Table 7.6 Average monthly adjusted performance of PIPOs and PRTS by market state

Portfolio	Sample	Average Mean Monthly Return ($amar_n$)	t-Test	Median Mean Monthly Return	Std Dev Mean Monthly Return	% of firms Mean Monthly Returns < 0	t-Test`
Property Investment IPO & RT							
All Issues	75	-0.22%	-1.39	-0.15%	1.37%	56%	4.22** Inv-Developme nt
Premium Market a	28	-0.07%	0.53	-0.08%	1.31%	54%	0.75 a-b
Discount Market b	47	-0.31%	-1.51	-0.17%	1.41%	57%	
Above Median SDNAV Market c	43	-0.21%	-0.93	-0.11%	1.48%	53%	
Below Median SDNAV Market d	32	-0.23%	-1.06	-0.35%	1.23%	60%	0.07 c-d
Property Development IPO &RT							
All Issues	80	-1.66%	-5.52**	-0.81%	2.69%	69%	
Premium Market a	19	-2.19%	-3.77**	-1.36%	2.53%	74%	-1.04 a-b
Discount Market b	61	-1.49%	-4.25**	-0.73%	2.74%	67%	
Above Median SDNAV Market c	34	-2.27%	-4.19**	-1.41%	2.66%	74%	-1.78* c-d
Below Median SDNAV Market d	46	-1.20%	-3.07**	-0.46%	2.65%	65%	

Notes: Table 7.6 presents arithmetic averages of mean monthly adjusted returns (equation [9]) from Property Investment and Property Development (IPO and RT) issuers in varying market conditions. Mean monthly returns are adjusted by Non-Issuing firm benchmarks and calculated for each firm from a maximum of 36 months post issue performance. ** 95% significance for two tail test, * 90% significance for two tail test.

d. Earnings patterns around the issue date

If cognitive bias and overvaluation is the source of underperformance, we should observe equity issuers having: (i) higher earnings growth than non-issuers prior to the issue date, and (ii) lower than expected growth in the aftermarket. The cognitive bias theory suggests the significant underperformance of Property Development equity issuers is caused by these firms having higher earnings growth than non-issuers prior to the issue date and then post-issue earnings growth which has not met investor expectations. The similar long-run performance of Property Investment equity issuers and non-issuers suggests that cognitive bias does not affect these specialist issuers; as they have low pricing uncertainty and similar earnings to non-issuers before and after

issue. The first objective of this section is to test the prior to issue predictions of the cognitive bias hypothesis.

Testing the post-issue predictions of the cognitive bias hypothesis is the second objective of this section. As earnings growth expectations are hard to quantify, direct tests of the post-issue part of the cognitive bias theory are difficult to undertake. However, by implication, investors must expect that the post-issue earnings growth of equity issuers will be greater than that of non-issuing firms. To assess whether equity issuing firms have post-issue earnings growth which is lower than expectations, their actual post-issue earnings growth can be compared to the earnings growth of non-issuing firms. If the earnings growth of issuers is not significantly greater post-issue, then investor expectations will not be met and underperformance will result.

If the average earnings growth of Property Development issuers is higher than non-issuers before the issue date and issuers then have the same or lower post-issue earnings growth as non-issuers, this would be evidence consistent with cognitive bias. Again, Property Investment firm equity issuers are predicted to have post-issue earnings equal to that of non-issuers.

To identify earnings trends the annual median and mean earnings growth percentages of 47 Property Investment and 42 Property Development RTs are computed for three years prior to and five years post-issue.[127] Added to this are data for 8 Property Investment IPOs and 16 Property Development IPOs, from the year prior to issue to five years subsequent.[128] The equity issuing firms are matched by a portfolio of Property Investment firm non-issuers and a portfolio of Property Development firm non-issuers. The matching portfolios are comprised of firms selected from the sample of non-issuing firms used in the analysis of long-run performance.[129]

127 Of the Property Investment IPO and RT sample 14 companies have multiple-issues included in the sample 16 Property Development firms have multiple issues included in the sample.
128 The decrease in sample size from our performance sample is caused by unavailability of earnings data on the Datastream files.
129 Firms in the matching portfolios were retained for the entire period and were chosen regardless of when the firm became delisted in order to avoid survivorship bias.

To illustrate earnings patterns, Table 7.7 and Figure 7.3 present the median annual earnings growth for both Property Development and Property Investment issuers over the period -2 years to +5 years.[130] Panel B of Table 7.7 shows that Property Development equity issuers have median earnings growth around 45% over years 0, 1 and 2, and from year 3 earnings growth medians reduce to 15%, 1% and -12% respectively. This pattern suggests operating performance decline and is consistent with the poor property markets Property Development firms operated in during the study period. In all years the Mann-Whitney test results do not indicate that equity issuers have different earnings growth from non-issuers. However, Property Development firm issuers do have mean earnings growth which is significantly higher in years 0 and 1. From year 2 mean earnings growth is indistinguishable from that of non-issuers. It appears that Property Development firms typically have high earnings in the year of the issue which is sustained temporarily but then declines to the level of non-issuing firms. These results can be interpreted as being weakly supportive of the cognitive bias hypothesis.

Panel A of Table 7.7 shows that issuing and non-issuing Property Investment firms have similar median earnings growth which does not decline post-issue. These results are consistent with the similar long-run performance of Property Investment firm issuers and non-issuers and suggests that cognitive bias does not affect these firms.

A comparison of the median standard deviation of annual earnings growth indicates that the earnings of both Property Development and Investment equity issuers is more volatile than the earnings of non-issuers. It is also found that the operating performance of Property Development firms is typically more volatile than the operating performance of Property Investment firms. The difference in earnings volatility between Property Investment and Property Development firms is expected given the classification of Property Development and Property Investment firms depends on the Rent-Earnings ratio, and contract rents should vary less over time than earnings from risky development projects. These results are further evidence

130 In operating performance studies it is conventional to concentrate on median measures because of the Skewness of ratio distributions.

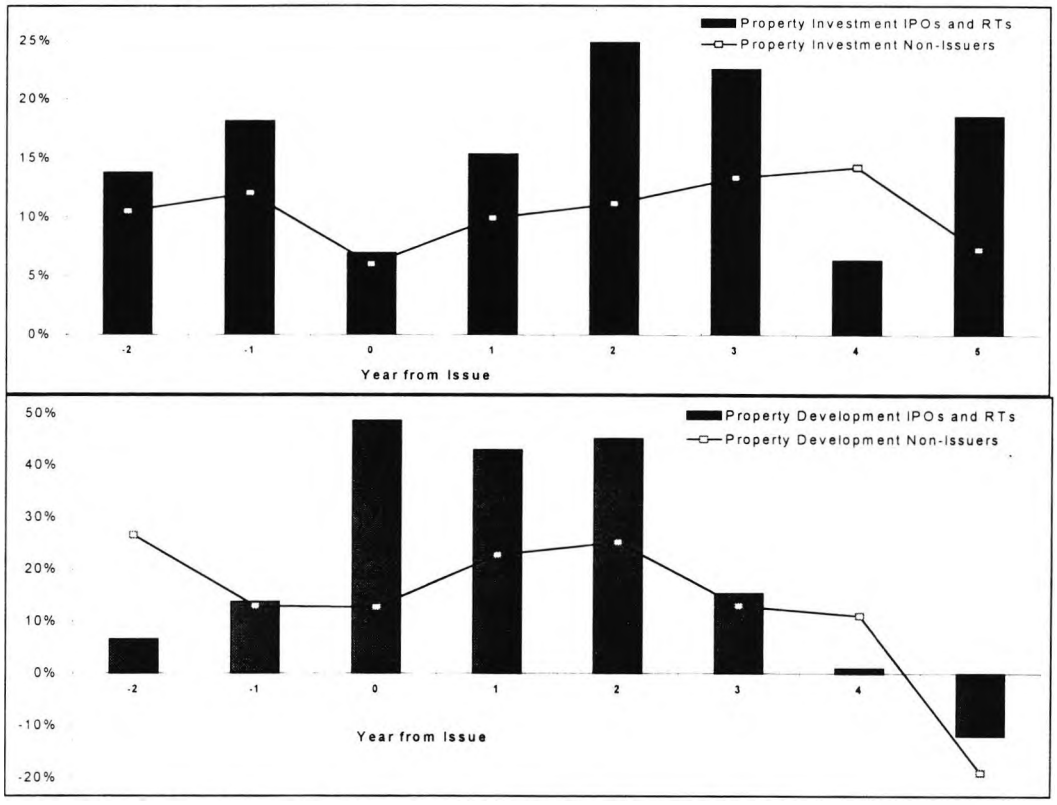
affirming that Property Investment firms have lower pricing uncertainty than Property Development firms.

Table 7.7 Annual earnings growth of Property Investment and Development firms

	Year From Announcement /Issue								
	-2	-1	0	1	2	3	4	5	Median Std Dev
Panel A. Property Investment IPO & RIGHTS ISSUE									
(Maximum Sample = 55)									
Issuers Median	14%	18%	7%	15%	25%	23%	6%	19%	33%
Non-Issuers Median	11%	12%	6%	10%	11%	13%	14%	7%	15%
M-W test probability	0.28	0.42	0.73	0.20	0.24	0.28	0.42	0.30+	0.00
Panel B. Property Development IPO & RIGHTS ISSUE									
(Maximum Sample = 58)									
Issuers Median	7%	14%	49%	43%	45%	15%	1%	-12%	80%
Non-Issuers Median	27%	13%	13%	23%	25%	13%	11%	-19%	58%
M-W test probability	0.18	0.99	0.38+	0.66+	0.42	0.95	0.38	0.80	0.01++

Notes: Table 7.7 presents median annual earnings growth percentages for portfolios of issuing and non-issuing Property Development and Property Investment firms. Mann-Whitney U (M-W) test is for two independent samples. + denotes where the difference between two means is significant at the 90% level [++ denotes 95%].

Figure 7.3 Annual earnings growth of Property Investment and Development firms



4 CONCLUSION

To explain the underperformance of new issues Loughran and Ritter (1995b) present a cognitive bias theory which challenges market efficiency. If the new issue effect is caused by investor cognitive bias, differences in long-run performance should appear between firms depending on their susceptibility to biases. This chapter has compared the post IPO and rights issue adjusted performance of a specialist group, Property Investment companies, to the adjusted performance of Property Development company equity issuers. The lower pricing uncertainty of Property Investment firms suggests they should be less susceptible to cognitive bias than Property Development firms, and thus perform better in the long-run. Furthermore, if Property Investment firm IPOs are fairly priced at the issue date, and overvaluation during optimistic market conditions is the sole root of long-run underperformance, these firms should not be associated with any underperformance.

A comparison of CAR and Holding Period returns confirms that Property Investment firms perform relatively better following an IPO or RT than Property Development firms. It is also found that negative mean abnormal returns exhibited by Property Investment equity issuers are indistinguishable from zero at conventional levels of significance. In contrast to Property Investment firms, Property Development IPOs and RTs show significant underperformance against all benchmarks over the sample period. The level of abnormal performance is found to depend on the benchmark used. A contribution of this chapter is to show that matching industry and activity type has a considerable effect on resulting excess returns. In the case of UK PIPOs in particular, All Share and Small Firm benchmarks considerably exaggerate abnormal performance.

It could be that the insignificant performance results for Property Investment equity issuers are a statistical manifestation and given a larger sample significant underperformance may be observed. However when the Property Investment IPO and RT samples are combined average monthly performance results still indicate normal performance. Only 56% of Property Investment company equity issues underperform in the next three years compared to 69% of Property Development company equity issues. Pooled cross-sectional results also indicate average performance of Property Investment companies equity issuers is indistinguishable from non-issuers; over the entire study period, and also in sub-periods.

The results for Property Investment and Property Development equity issuers suggest that pricing uncertainty influences the magnitude of underperformance. The results are also consistent with the cognitive bias theory. To test the cognitive bias theory the performance of Property Investment and Property Development equity issuers under various issue date conditions, and earnings patterns were examined. Property Investment firms issuing equity typically have stable earnings similar to the earnings of non-issuing firms before and after issue. Furthermore, the adjusted performance of Property Investment firms depends on neither the SDNAV nor the number of other PIPOs at the issue date.

Weak evidence is found that Property Development equity issuers conform to the patterns predicted by cognitive bias. The average underperformance of Property Development firms issued in buoyant markets is more severe than the underperformance of issuers in normal conditions. Property Development firms show some evidence of high operating performance near the issue date and then reversion to the operating performance of non-issuing firms.

The similar long-run performance of PIPOs and PRTs documented in this chapter is consistent with Affleck-Graves and Page's (1995) contention that periods of high issue activity are not necessarily caused by firms timing issues to take advantage of new shareholders. Tests of the effect of issue activity at the issue date on long-run performance provide only modest support for overvaluation timing. Following a hot issue market Property Development firms do significantly underperform, but this does not appear to be when the worst performance takes place. There is no evidence of overvaluation timing by Property Investment IPOs and RTs. It appears that managers have motives for timing issues other than taking advantage of new shareholders. An alternative timing theory, that managers time equity issues for when going public is less costly, is the subject of the remaining empirical chapters of thesis.

An examination of the cross-section of property stocks over the period 1984 to 1994 confirms that neither book-market nor size characteristics are associated with new issue effects in the UK property share market. This analysis appears to be the first non-US examination of the influence firm specific characteristics have on securitised real estate equity returns. Interestingly the evidence shows that larger property companies have significantly outperformed smaller property companies over the last 11 years. These findings also support Loughran and Ritter's (1995a) conclusion that firm characteristic effects may stem from the new issue phenomenon.

Because of the considerable growth in securitized real estate markets and the absence of research examining PIPO or PRT long-run performance, one of the aims of this chapter was to determine if securitised real estate new issues are good investments.

In contrast to results from studies of operating firms, this study of Property Investment companies following IPOs and RTs, provides no significant evidence of underperformance. Hence there appears no reason for investors to be wary of securitised real estate equity issues.

CHAPTER 8

Windows Of Opportunity For Going Public[Φ]

1 INTRODUCTION

Chapter 2 identified four key stylised facts related to IPO activity. First, IPO issue volume is auto-correlated and hot issue markets exist without periodicity. Second, firms tend to go public near stockmarket peaks and when there is an improvement in business conditions. Third, non-synchronous industry hot issue markets occur. Fourth, the volume of IPOs and SEOs varies over time together.

Chapter 3 reviewed three possible reasons for variations in IPO activity: business opportunities, overvaluation timing, and time varying market imperfections. The first reason why IPO and SEO activity should be positively correlated is that over time there are some periods when better investment opportunities are available to firms. Firms should raise equity when business conditions are improving and there are more positive NPV projects available. In such periods it would also be expected for the level of the stockmarket to be relatively high. However, variations in business opportunities would not appear to be great enough to explain the dramatic increases in volume found in IPO hot issue markets.

There is a belief among academics and practitioners that "windows of opportunity" cause hot issue markets in IPOs and SEOs. In the IPO literature windows of opportunity are hypothesised to result from overvaluation timing. As discussed in Chapter 3, the overvaluation timing hypothesis is that firms deliberately time equity issues for when overvaluation occurs. Chapter 3 reviewed the mixed evidence concerning overvaluation timing. Empirical evidence outside the US does not support the theory. Furthermore, the results of this thesis tend to reject overvaluation timing. In Chapter 7 we found that rights issues exhibited underperformance, despite

Φ Parts of this chapter are contained in Gerbich and Levis (1996b). All content and errors are my own.

the motivation for overvaluation timing being removed for these issuers. Furthermore, Property Development companies undertaking equity issues did not have their worst performance following a hot issue market and Property Investment companies that issued equity showed no change in performance following hot issue markets.

Chapter 3 introduced the work of Choe, Masulis and Nanda (1993) and Bayless and Chaplinsky (1996) which contends that variations in adverse selection costs, resulting from information asymmetry, underlie variations in SEO activity. The adverse selection costs faced by firms is the difference between the intrinsic value of equity and the value that investors determine given the negative information revealed by the announcement of an equity issue. Choe, Masulis and Nanda (1993) argue adverse selection costs decrease as business conditions improve. Bayless and Chaplinsky (1996) hypothesise that lower adverse selection costs result in windows of opportunity to issue equity. Evidence of lower SEO announcement price reactions in both improved business conditions and hot issue markets support the claims of Choe, Masulis and Nanda (1993) and Bayless and Chaplinsky (1996).

This chapter defines windows of opportunity as periods when business conditions are favourable and the costs of going public are significantly lower. Two ways to achieve lower costs are proposed in this chapter. First, extending the arguments of Choe, Masulis and Nanda (1993) and Bayless and Chaplinsky (1996) to the IPO decision, adverse selection costs should be lower when business conditions are good. Second, an improvement in business conditions makes it possible for firms to gain economies of scale in the high direct issue costs facing firms going public if a larger issue size is adopted. Both these effects predict that IPOs will cluster near peaks in business conditions. Conversely, few IPOs are expected in poor business conditions as firms wait for lower costs.

Empirical tests on a sample of 1261 UK IPOs issued between 1981 and 1995 are supportive of windows of opportunity. In contrast to previous studies using monthly or quarterly data, this study uses the time between transactions, termed duration, to

measure issue activity and define hot and cold issue markets. This intuitive measure of issue activity reveals variations in IPO activity that are masked by temporal aggregation. The duration findings suggest that the time between IPOs reduces significantly near a peak in business conditions or when the level of stockmarket is high relative to its recent past. The longest time between IPOs is before a trough in business conditions. Consistent with windows of opportunity lower average first day returns and direct costs are observed in hot issue markets compared to cold issue markets. The difference in average initial returns is estimated to be 11%. The difference in average direct issue costs is between 1.7-3.3% depending on contract method.

The chapter is organised as follows: In section 2 inter-temporal variation in adverse selection costs, and economies of scale in direct issue costs are explained. Empirical analyses of the timing of IPOs are conducted in section 3. Concluding comments are made in section 4.

2 WINDOWS OF OPPORTUNITY FOR GOING PUBLIC

a. Timing for reduced adverse selection costs

SEO adverse selection costs

Recently there has been interest in information asymmetry, business cycles and the timing of SEOs. SEO asymmetric information models posit that a firm's financing behaviour is determined by how original shareholder wealth changes as a result of the financing choice. They assume managers should have an advantage over the market in predicting firm specific events, and this creates an information asymmetry. The size of the asymmetry can vary over time and becomes considerably important when the firm requires external capital. The presence of information asymmetry gives firms the potential to exploit overvaluation, thereby creating an adverse selection problem.

Investors rationally interpret an equity issue announcement as news that the firm may be overvalued. Investors require that all equity issuers have a price equal to the average of the intrinsic value of firms issuing equity; thereby penalising equity issuers that are not overvalued.[131] The adverse selection costs of equity issue arise when the intrinsic value is greater than the price after the announcement of an equity issue. Firms can avoid the cost of issuing equity below intrinsic value by using internally generated funds, issuing debt, or by delaying the equity issue until information asymmetry is less problematic.

Myers and Majluf (1984) suggest that adverse selection costs can be reduced if macroeconomic or firm specific information persuades investors that the equity decision does not signal overvaluation. They also argue adverse selection costs will reduce if the discrepancy between the manager's and investor's information decreases. The contribution of Choe, Masulis and Nanda (1993) is to link the magnitude of adverse selection costs to inter-temporal variations in SEO activity. They argue firms sell equity near peaks in business conditions because they face lower adverse selection costs.

Choe, Masulis and Nanda (1993) show that a marginal firm, which is indifferent between issuing debt or equity to fund an investment project, faces the following total costs of issuing equity and debt;

$$Pi^*(q) / Pe(q) [I + Ce] = I + Cd + \pi x \qquad [1]$$

The left hand side of equation [1] represents the marginal firm's total cost of issuing equity. The total cost of issuing equity is a function of the adverse selection cost ratio and the size of the issue. The adverse selection cost ratio, **Pi*(q)/Pe(q)**, represents the cost of issuing equity at the written down announcement price **Pe(q)** when the intrinsic value is **Pi*(q)**. Both the intrinsic value and announcement price of equity are expressed as an increasing function of business conditions **q**. The total amount

131 Investors will only participate in the equity issue market if they are not disadvantaged by overvaluation. Investors will accept a write down to the average intrinsic value of equity issuers because then, on average, they will not be disadvantaged by

required for a project is represented by **I** and the direct costs of issuing equity are represented by **Ce**.

The right hand side of equation [1] represents the marginal firm's total cost of issuing debt. The amount required for the project is **I. Cd** is the direct costs of issuing debt and **πx** is the moral hazard costs of debt.[132] From equation [1] it can be seen that firms with a higher value of **Pi*(q)** will be more undervalued than the marginal firm, face greater adverse selection costs, and thus prefer debt to equity.

Choe, Masulis and Nanda (1993) contend that in expansionary business conditions there is less negative information revealed by the announcement of an equity issue and the adverse selection cost is a lower proportion of the firm's intrinsic value. From equation [1] (left hand side) it can be seen that the total costs of issuing equity decrease if both **Pi*(q)** and **Pe(q)** increase by the same amount.[133] Choe, Masulis and Nanda (1993) hypothesise that in expansionary business conditions equity announcements will have smaller negative price reactions and the proportion of equity issues to debt issues will increase.

IPO adverse selection costs

Seasoned companies may rationally issue external equity in expansionary periods of the business cycle, but IPO firms must also consider the implications of changing from a privately held company to a publicly listed company. Taking into account the factors affecting the going public decision, adverse selection timing theory can be applied to the IPO market. It is reasonable to assume that if an unlisted firm finds debt cheaper than private equity it will issue debt. However if private equity is preferred to debt, it does not immediately issue private equity, but then evaluates the going public project as an alternative to the private equity market.

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the overvaluation of individual firms [Choe Masulis and Nanda (1993)].

132 The moral hazard cost results from rational debtholders anticipating that managers will undertake asset substitution activity. See for example Myers (1977) and Jensen and Meckling (1976).

133 The intrinsic value and announcement price of equity increase by the same amount because an increase in general business conditions is expected to affect the cash flows of all firms (equity issuers and non-equity issuers) similarly [Choe, Masulis and Nanda (1993)].

Following the ideas of Choe, Masulis and Nanda (1993), consider a marginal firm that prefers not to issue debt and is indifferent between private equity and public equity. For such a firm the total costs of issuing public equity for an investment project are comprised of the adverse selection costs, the present value of the benefits from going public, the cost of the project and the additional direct costs of an IPO. As the firm is indifferent between equity types, these costs must equate to the total costs of issuing private equity. The total costs of public and private equity for a marginal firm are represented in equation 2.

$$Piz^*(q) / Pez(q) [I + C + a] - b = Piz^*(q) / Pez(q) [I + C] \qquad [2]$$

The right hand side of equation [2] represents the total cost of issuing private equity. **Piz*(q)** is the intrinsic value of the marginal firm. The written down value of an unlisted firm following announcement of an intention to sell equity is represented by **Pez(q)**. The direct costs of a private equity placement are represented by **C** and **I** is again the amount required for a project.

The left hand side of equation [2] represents the total cost of an IPO. The direct costs of undertaking an IPO are represented by **C** and **a,** where **a** is the additional cost of an IPO compared to a private equity sale. The expected present value of benefits from going public are represented as **b**. The project again requires **I**.

The adverse selection cost faced by the marginal unlisted firm is the result of information asymmetry between the firm and external equity providers. There is limited public information about unlisted firms, and it is reasonable to assume that the intrinsic value of an unlisted firm is uncertain. Managers have an information advantage over investors and this gives the managers of unlisted firms the potential to exploit overvaluation. Rational investors assume some unlisted firms will be overvalued and require that all unlisted firms announcing an issue of private or public equity have the price of their equity revised downward. Adverse selection costs arise for those firms with a written down price which is below intrinsic value.

It follows from Choe, Masulis and Nanda (1993) that the adverse selection costs faced by an IPO should be greater than that of a similar seasoned equity issuer. Choe, Masulis and Nanda (1993) show that cross-sectional differences in the uncertainty of equity issuers will result in differences in adverse selection costs and initial price reactions across firms.[134] The lack of a secondary market price should result in greater uncertainty regarding the intrinsic value of an unlisted firm compared to that of a listed firm. Investors require that the written down price of an unlisted firm be lower than the written down price of a similar seasoned firm because they face greater uncertainty about the intrinsic value of unlisted equity issuers compared to seasoned equity issuers. Thus it is reasonable to contend that $\mathbf{Pez(q)<Pe(q)}$. By choosing public or private equity the unlisted firm reveals negative information with resulting adverse selection costs that are greater than the adverse selection costs of seasoned firms.

Upon listing, it would also appear reasonable that the uncertainty difference between IPO firms and SEO firms is reduced. The evidence of abnormally high trading volume on the first days of trading IPOs reviewed in Chapter 2 indicates a high level of information processing in the early aftermarket. Furthermore Investors are now able to observe a secondary market price. Thus it is expected that $\mathbf{Pez(q)_{t=0}<Pez(q)_{t=1}}$. The reduction in uncertainty once an IPO begins trading should therefore result in a positive first day return being observed.[135]

The substantial fixed costs of undertaking an IPO have an important affect on the choice between private and public equity. Chapter 4 showed that the direct costs of an IPO average around 9% of the amount raised in the IPO. This is likely to be far greater than the cost of arranging a private equity sale. As a firm must raise enough capital for investment projects after issue costs, those firms choosing an IPO must raise more capital than private equity issuers.

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134 They show that the effect of a mean preserving spread on the distribution of intrinsic values Pi*(q) is to shift the probability mass toward the tails thereby decreasing the average value of equity issuers and thus Pe(q).

135 This could be interpreted as part of an underpricing premium required by subscribing investors.

The additional equity raised by IPO firms, **a,** also incurs adverse selection costs caused by information asymmetry. It can be seen from equation [2] that because of the adverse selection cost of raising the added direct cost for an IPO, firms with a value above the marginal unlisted firm **Piz*(q)** will find the total cost of an IPO greater than private equity costs. These firms will issue private equity. Conversely firms below the marginal firm will prefer public equity. This application of adverse selection cost theory infers that of all unlisted firms considering an equity issue the highest quality group issue private equity and the lowest quality group undertake IPOs.

Choe, Masulis and Nanda (1993) predict that in expansionary business conditions the importance of adverse selection costs to the SEO decision decreases as both the after announcement price and the intrinsic value of equity increase by the same amount. Similarly, with IPOs a business conditions improvement causes the importance of adverse selection costs associated with going public to decrease.

The effect of better business conditions on IPO markets is to increase IPO activity and decrease average initial returns. First, as the written down price $\mathbf{Pez(q)_{t=0}}$ and the intrinsic value **Piz*(q)** of unlisted equity issuers increase by the same amount, the total adverse selection cost is necessarily a lower percentage of intrinsic value. More firms will be below the new marginal firm and therefore the proportion of firms choosing to issue public equity increases. All else equal IPO volume should increase.

Second, as $\mathbf{Pez(q)_{t=0}}$ and $\mathbf{Pez(q)_{t=1}}$ rise by the same amount following an increase in business conditions **q,** the difference between $\mathbf{Pez(q)_{t=0}}$ and $\mathbf{Pez(q)_{t=1}}$ is a lower proportion of the new $\mathbf{Pez(q)_{t=0}}$ Therefore lower percentage price rises on the first day should be observed. These arguments are summarised in the following hypothesis.

Hypothesis 4 : Adverse selection costs and business conditions

An improvement in business conditions decreases the adverse selection costs associated with IPOs. All else equal, an unlisted firm is more likely to issue public equity than private equity, IPO volume will increase and first day returns will decrease.

b. Timing for economies of scale in issue costs

Loughran and Ritter (1995a) argue that the large swings in the volume of SEOs are inconsistent with firms purely attempting to mitigate -3% average announcement reactions. Of course, increased investment opportunities can also raise IPO activity in periods of business prosperity, thus assisting adverse selection costs in forming hot issue markets. However there is an another effect that business conditions have on IPO costs that may influence issue activity.

An important decision to be made by the firm is the size of the issue. Size is important both in terms of the value of the offer and the proportion of the value of the firm that is sold. The London Stock Exchange requires that a minimum of 25% of the value of the equity to be listed must be in the hands of public investors following the IPO. Issuing greater than 50% of the equity value of the firm would give the control of the firm completely to new shareholders and subsequently we find new firms mostly issue less than 50% of their equity. Levis (1993) for example reports the median proportion of equity issued by UK IPOs is around 35%.

Chapter 4 reviewed evidence from US and UK studies that confirm the existence of considerable economies of scale in direct issue costs. Economies of scale also appear in the sample of Property Investment and Property Development IPOs examined in Chapter 4. The benefits of issuing a larger nominal amount of equity can be shown in a simple example.

A firm wishing to undertake a Placing of new equity on the London Stock Exchange would reasonably expect fixed costs of 1995£400,000 plus variable costs of around

4% of issue size. A small firm with equity value of £25m (following the IPO) would probably consider issuing between £6.25m and £12.5m (£25m*0.25< issue <£25m*0.50). Thus an issue of 25% of the equity (£6.25m) would cost £655,000 or 10.4% of the issue size. An issue of 50% of the equity (£12.5m) would cost £900,000 or 7.2% of the issue size.

When business conditions cause the value of assets and therefore the equity value of the firm to increase, the firm can issue a larger nominal amount of equity within a target control dilution. Because of economies of scale in direct issue costs, an increase in the amount of equity issued decreases the percentage cost of going public. If the firm holds a constant dilution target we can estimate the effect on issue costs of a rise in the value of the firm. Let us assume a 25% increase in value and a constant 25% dilution level. The new issue size would be £7.81 m (£31.25m*0.25) with a cost of £712,500 or 9.12% of the issue size. If the firm decided to also increase the target dilution level to 50% when the value rise occurred then the issue costs would decrease by 6.56% of the amount raised, representing a percentage change of 36.92%. This simple example has shown that an increase in value can allow the firm to make significant economies in issue costs, thus firms are more likely to go public.[136] The following hypothesis results.

Hypothesis 5 : Scale Economies of Issue Costs and business conditions

An improvement in business conditions allows greater issue size within a target control dilution. Economies of scale in IPO costs reduce the percentage costs of larger issues and therefore, all else equal, the number of IPOs will increase.

It is important to note that a firm cannot maximise both economies of scale in direct costs and the savings in adverse selection costs, which are available following a business conditions improvement.[137] There is a necessary trade-off between economies of scale in issue costs and adverse selection costs. The direct cost savings available in improved business conditions arise from issuing more equity, which then

136 It is necessary to assume that the reduction in costs from IPOs due to economies of scale are greater than those available for issuing private equity or debt, for a firm to be more likely to go public. This would appear reasonable given the higher total costs of IPOs.

137 I would like to thank Dr Ayo Salami for emphasising this point.

incurs adverse selection costs. Thus in better business conditions a firm may increase the size of an issue to enjoy economies of scale, but then the issuer must forego the maximum reduction in adverse selection costs. Conversely a firm which issues the same nominal amount would gain from adverse selection cost reductions but would not enjoy economies of scale.[138]

To summarise, this chapter argues that IPO activity should increase with business conditions not only because of increased investment opportunities, but because firms incur lower costs. Better business conditions cause the adverse selection costs associated with new public equity to reduce. Firms can also issue more equity within a target control dilution when prices are high, thus benefiting from economies of scale in IPO issue costs. The two effects; lower adverse selection costs and economies of scale in issue costs, provide windows of opportunity in IPO markets. These predictions are tested in the remainder of the chapter using a sample of UK IPOs.

138 The choice of a firm between the two savings types is not investigated in this paper. However it would appear that details such as the size of the issue and the uncertainty of the issuer are likely to affect the choice.

3 METHODOLOGY AND SAMPLE

a. Sample

The primary source of the IPO data used in this study is the KPMG Peat Marwick McLintock New Issue Statistics. Other data sources include: the Investors Chronicle, various stockbrokers annual reviews, and Extel Financial Prospectus Summaries and New Issues Summaries.

The estimated total population of IPOs listed on the Main and Unlisted Securities Market of the London Stock Exchange between 1980 and 1995 is 1455. 182 of the companies were excluded from the sample because: the precise date of issue was not able to be determined, unidentified company name, or other missing information on the KPMG statistics. This reduces the dataset to 1273 IPOs. Because data for 1980 are incomplete, this study uses a sample comprising 1261 IPOs listed between January 1981 and December 1995.[139] The final sample represents 87% of the total market by volume, and because missing firms are generally small issues, the coverage by value is likely to be higher.

Table 8.1 reports the annual distribution of new issues in the London markets and the distribution of the sample.[140] The annual average volume of new issues (excluding 1980) is 92 which, although higher than almost all other international capital markets, is low compared to the 322 average annual volume on US markets reported by Ibbotson, Sindelar and Ritter (1995). There is considerable variation in the number of issues and the amount of capital raised by IPOs over time. The most active spells for the IPO market during the study period have been 1986 and 1994.

139 The dataset includes the sample of 712 UK IPOs during the period 1980-1988 analysed by Levis (1993). New listings on the Alternate Investment Market (AIM) during 1995 are not included.
140 Appendix 8A presents the monthly volume and value of IPOs over the study period.

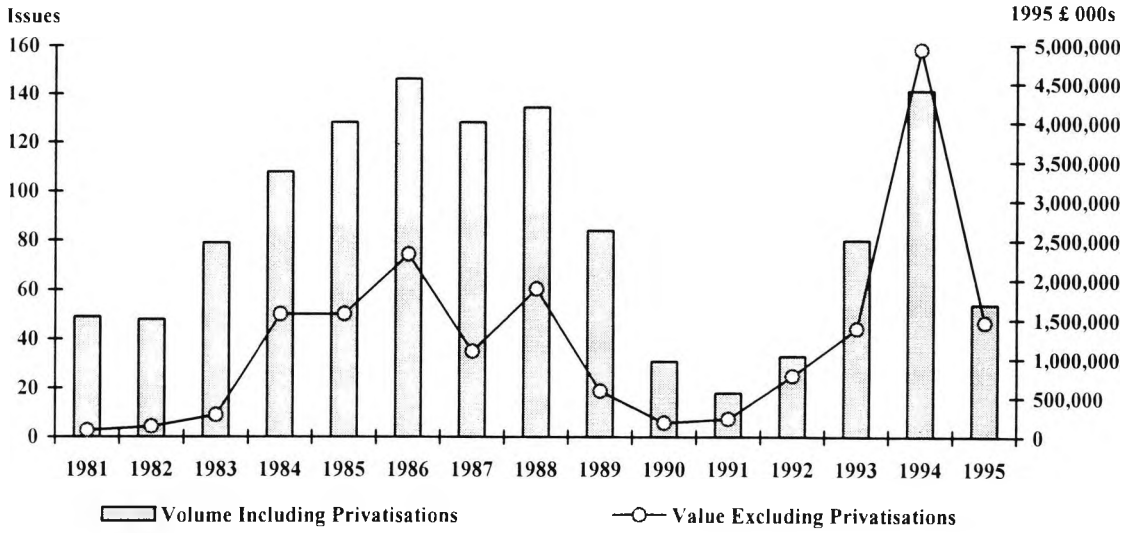
Over the fifteen year period the sample contains IPOs with a combined real value of £67.3 billion.[141] It is evident that approximately £45.2 billion (67% of the total amount) of new equity capital has been raised by privatisations and one-off extraordinarily large IPOs.[142] The mid and late 1980's saw privatisations dominating the capital raised in the primary market. Figure 8.1 presents the total volume (including privatisations) and the total amount raised (excluding privatisations).

Table 8.1 Distribution of IPO sample by year of issue

Year	IPO Population	IPO Sample		Excluding privatisations	Excluding privatisations
	Number of issues	Number of issues	Amount Raised 1995 £ 000s	Number of issues	Amount Raised 1995 £ 000s
1981	49	49	80,451	49	80,451
1982	48	48	130,550	48	130,550
1983	79	79	279,698	79	279,698
1984	108	108	8,306,932	106	1,563,537
1985	128	128	1,567,946	128	1,567,946
1986	146	146	12,757,223	144	2,321,893
1987	128	128	7,195,876	124	1,093,210
1988	134	134	5,193,982	133	1,884,825
1989	84	84	8,253,751	73	587,960
1990	53	31	6,005,965	19	182,150
1991	46	18	7,359,904	14	3,795,559
1992	48	33	1,439,981	32	778,500
1993	124	80	1,381,751	80	1,381,751
1994	190	141	5,839,890	140	4,939,390
1995	78	54	1,463,070	54	1,463,070
All	1443	1261	67,256,970	1223	22,050,490

141 All monetary amounts are adjusted by the RPI to 1995 pounds.
142 The details of these 38 transactions are reported in Appendix 8B.

Figure 8.1 The Value and Volume of UK IPOs 1981-1995



b. Research design

The objective with the sample data is to model the frequency and distribution of IPO transactions as a function of economic determinants. Since the usual methods of econometric analysis are based on chronological data (e.g. daily, monthly, yearly) it is not surprising that previous studies such as Hogholm and Rydqvist (1994), Loughran, Ritter and Rydqvist (1993) and Ljungqvist (1995) have chosen a time interval and aggregated the transactions within that interval.

Aggregation of the data is likely to be an important influence on timing analyses. If too long an interval is chosen there will be a dramatic loss of information and if too short an interval is chosen most cells will be zero. The difficulty in choosing an interval is even more problematic when frequencies of transactions change over time. In many countries we expect to have quiet IPO periods around the summer holidays. Previous studies have shown that IPO transactions tend to be relatively infrequent and then suddenly to have high frequencies in the form of hot issue markets. In these cases the interval choice of the researcher may disguise the period of most interest or leave the researcher with many uninformative data points. If aggregated data is adopted a further choice that the researcher must make is whether to model the value

of issues or the number of firms listing over time. Both value and volume have theoretical advantages and require different econometric treatment.

In recognition of the issues of analysing timing data this study examines new issue activity using two variables. First, the time in days between consecutive IPOs, termed duration, is allowed to be a random variable to be analysed, instead of selecting a fixed interval for aggregating the data. Using descriptive statistics, the effect of explanatory variables on IPO duration is examined. Second, a monthly time-series of the aggregated real amount of equity issued by IPOs is analysed using a multiple regression methodology. As Table 8.1 suggests the amount of equity issued is dominated by privatisations, and these issues may have special timing characteristics, the 38 privatisations and extraordinarily large IPOs are excluded from the regression analysis.

c. Duration methodology

The first analysis of the timing of IPOs uses a dataset comprising a list of daily durations and explanatory variables representing business conditions at each IPO date.[143] The net working days since the previous IPO transaction is defined as the duration of each IPO [δ_i]. As the sample only covers 87% of the IPOs over the period the calculated durations are upwardly biased. However, because the excluded observations occur over the 1990-1995 period, which included both active and slow markets, the estimation of deterministic trends in the data should not be greatly affected by the sampling.

$$\delta_i = [\text{date}_{IPO} - \text{date}_{IPO-1}] \qquad [3]$$

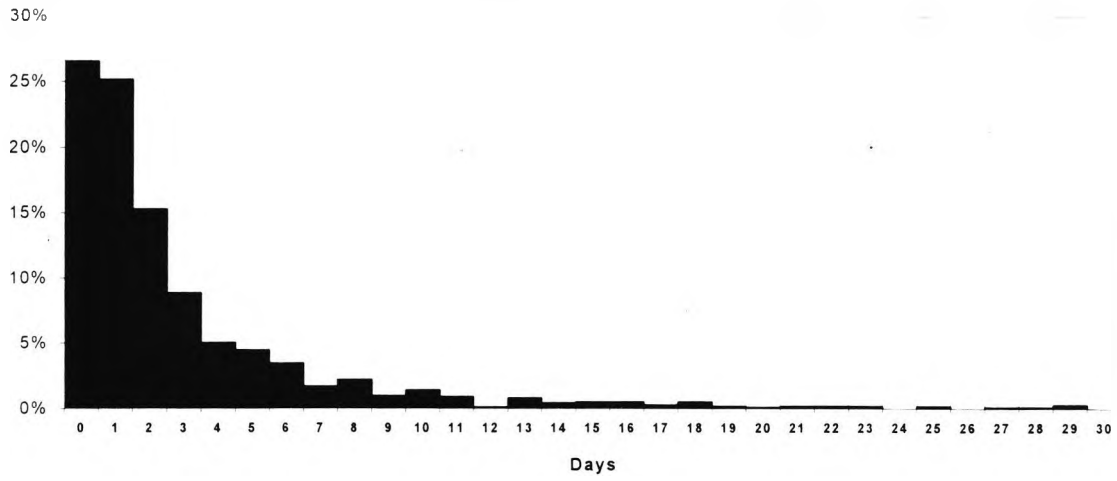
where:

δ_i = duration of IPO ***i*** excluding non-working days
date_{IPO} = the date of the IPO expressed as a serial number
date_{IPO-1} = the date of the previous IPO expressed as a serial number

143 For a review of the use of duration data in economic modelling see Lancaster (1990).

Figure 8.2 presents a histogram of IPO durations up to 30 days. A duration of zero is the most frequent in the dataset; therefore IPOs are most likely to arrive on the same day as another IPO. Over 52% of IPOs arrive within one day of the previous IPO and over 85% of IPOs arrive within one working week of the previous IPO. The shape of the distribution is markedly similar to that found for the duration in seconds between transactions such as foreign exchange trades.[144]

Figure 8.2 Histogram of IPO Durations



Before examining the links between IPO durations and the explanatory variables it is necessary to check that seasonal variations will not hinder the observation of causal relationships. To uncover the seasonal aspects of IPO timing the variations in IPO activity are first examined depending on the month of issue. Panel A of Table 8.2 reports the issue volume, mean duration and percentage of the total sample issued in each calendar month.

There appear to be substantial seasonal variations in IPO activity. Months with the fewest IPOs are January, February, August and September. These months all have a lower proportion of transactions than the null hypothesis of $1/12^{th}$ of the sample. In January and September the expected spell between IPO transactions is greater than a working week and more than double the mean duration of 3.10 days. Over the remaining months the expected duration between IPOs is two or three days, with

144 See for example Engle and Russell (1995).

June, July and December being the most popular months. Figure 8.3 illustrates the monthly trends in IPO activity.

The most likely explanation for monthly variations in activity is vacation timing. Richardson (1976) argues that the months available to undertake an IPO are reduced by behavioural characteristics of the City of London. Over the months August and September summer holidays are taking place and following Xmas there are many holidays and budgets are checked. While not wholly convincing, these arguments do predict low activity over the periods where low issue volume exists.

Apart from slow IPO activity post Xmas and during the summer holiday periods, there are also considerable variations in activity during the working week. Panel B of Table 8.2 reports the issue volume for IPOs by day of the week. Monday and Thursday appear to be the most popular issue days with 56% of the total activity between them. These days both have greater proportions of transactions than the null hypothesis of $1/5^{th}$ of the sample. Figure 8.4 illustrates the daily trends in IPO activity.

Patterns in daily activity also appear related to characteristics of the London Market. The London Stock Exchange's procedures for admission of securities require that new issues be formally granted admission following a listing committee approval. As discussed in Chapter 4 the Exchange usually considers applications for admission on Wednesdays and Fridays. On the following working days, Thursday and Monday, shares of successful applicants usually begin trading.[145] Thursday and Monday are the days of highest IPO volume in the sample data.[146]

To examine the duration of IPOs without the complications of seasonal and day of the week variations these effects are partialled out by regressing the duration of IPOs

145 The day of the week effects in IPO activity do not appear to be linked stock return anomalies. Choy and O'Hanlon (1989) report abnormality in returns depending on days of the week but their evidence bears no obvious relationship to IPO activity.
146 A further institutional feature of the London Stock Exchange is the Bank of England queuing system which has been in place over the sample period. Currently the system runs very informally. It is usual practice for the sponsor of the issue to notify the Bank of England of the size, sector and expected date of issue of an IPO. The Bank of England will then advise whether this date is suitable for a listing of this type or whether an alternate date is recommended. The issuing firm is under no obligation to alter the planned date however practitioners generally follow the Bank of England advice.

against monthly and daily dummy variables. A Poisson distribution is assumed for the dependant duration variable and the regression estimated using maximum likelihood procedures. The regression equation is defined below;

$$\delta_i = \mathbf{c} + \mathbf{Am} + \mathbf{Bd} + \mathbf{e}_i \qquad [4]$$

Where: δ_i is the duration for IPO i, ***m*** is a i x 11 matrix of dummy variables for February to December, ***d*** is a i x 4 matrix of dummy variables for Tuesday to Friday, and ***A*** and ***B*** are estimated parameters. The constant in the regression represents the expected duration on a Monday in January. The resulting residuals represent a measure of duration unexplained by calendar effects with a mean of zero.

Table 8.2 IPO activity by issue month and work day

Panel A: Month	Number of Issues	% of Total	Mean Duration	Panel B: Week Day	Number of Issues	% of Total	Mean Duration
January	39	3.09	7.28	Monday	332	26.33	4.73
February	70	5.55	4.17	Tuesday	243	19.27	6.00
March	120	9.52	3.35	Wednesday	159	12.61	3.68
April	113	8.96	3.07	Thursday	372	29.50	2.59
May	122	9.67	2.90	Friday	155	12.29	2.14
June	167	13.25	2.00				
July	147	11.66	2.01				
August	55	4.36	4.73				
September	53	4.20	6.00				
October	110	8.72	3.68				
November	118	9.36	2.59				
December	147	11.66	2.14				
All Issues	1261	100	3.10		1261	100	3.10

Figure 8.3 Percentage of IPOs by month of issue

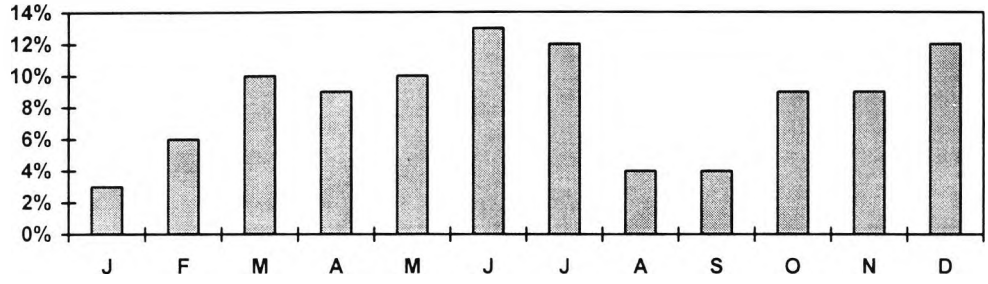
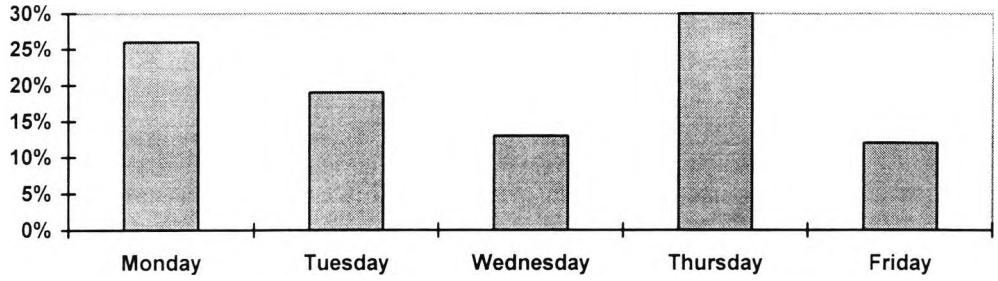


Figure 8.4 Percentage of IPOs by day of issue



4 EMPIRICAL RESULTS

a. Business conditions and IPO durations

The adverse selection cost and scale economies of issue costs hypotheses both predict that IPO durations should be low when business conditions are near a peak. Conversely when business conditions are near a trough larger durations are expected.

The analysis in this section compares the mean durations for portfolios of IPOs grouped by three variables measuring the different aspects of business conditions. The Central Statistical Office [CSO] Coincident and Longer Leading Cyclical Economic Indicators are the first and second proxies of business conditions. The CSO Cyclical Indicators chart movements in the economy over an assumed regular business cycle. They aim to identify in advance and concurrently when economic

growth is reaching a peak (trough) and therefore entering a downturn (upturn).[147] The indicators consist of economic series chosen because of their consistent relationship to turning points in economic activity, and because there is an underlying rationale to account for this relationship [Central Statistical Office (1996)].[148] The Coincident Indicator is intended to move in line with turning points in the business cycle.[149] The Longer Leading Indicator attempts to predict turning points in the business cycle one year or more in advance.[150]

The third variable to proxy business conditions is based on the level of the UK stockmarket. Although the influence of the level of the stockmarket on the volume of IPOs has been established [Loughran, Ritter and Ryndqvist (1993), Ljungqvist (1996) and others], this is the first examination of the effect of the level of the market on the time between IPOs. To proxy for the level of the market the ratio of the FT All share index at the issue date [FTA_t] to it's 780 day (3 year) moving average [$FTA780_t$] is used. This variable has the intuitive interpretation of when the market is high or low relative to its recent past. For each IPO the market relative on the issue date [$mkrel_{it}$] is calculated below.

$$mkrel_{it} = FTA_t / FTA780_t \qquad [5]$$

To test the effect of an explanatory variable on duration, the data is first sorted by the variable of interest. Ten equally sized portfolios are then constructed. The first portfolio contains firms with the smallest values of the explanatory variable while the tenth portfolio contains firms with the largest values. For each portfolio the mean duration and mean seasonally adjusted duration is calculated.[151] IPO durations are expected to decrease as the Coincident Indicator increases, whereas a negative

147 Prior to October 1983 and post October 1993 the reference business cycle was derived from GDP, whilst the Coincident Indicator was used in between these dates.The indicators are not interpreted as a measure of the level of economic activity or an economic growth rate. For detailed information regarding the CSO Indicators see Moore (1993) and CSO (1996).

148 A composite index is formed by taking an average of the detrended, scaled and smoothed component series. The component series included in the indices and the methodology adopted by the CSO are periodically revised.

149 The Coincident Indicator is currently comprised of six component series; GDP at factor cost, an index of production, CBI quarterly surveys of below capacity utilisation and the change in stocks of raw materials and the monetary aggregate (M0) divided by the GDP deflator.

150 The Longer Leading Indicator is currently comprised of; the financial surplus of industrial and commercial companies (divided by the GDP deflator), the CBI quarterly survey of changes in optimism, the 3 month prime bank bills rate of interest, the yield curve (3 month bank interest rate less the 20 year par yield) and the total number of dwellings started in Great Britain.

relationship between the Longer Leading Indicator and IPO durations would suggest firms are timing issues before a peak of the economy. A negative relationship between the relative level of the market and duration is anticipated as the prosperity of the stockmarket proxies for better business conditions and higher equity valuations.

Table 8.3 presents the mean duration and mean seasonally adjusted duration for ten portfolios compiled on the basis of the level of the business cycle indicators and the market relative in the month of the issue. The average explanatory value for each portfolio is also reported (all CSO Indicators are set to 100 when equal to their long-term trend). The results of Table 8.3 Panel A, B, and C are displayed graphically in Figure 8.5 a, b, and c.

Panel A shows the Coincident Indicator is negatively related to duration. The mean duration is 5.31 days during the poorest coincident economic conditions, significantly higher than the 3.01 days in the best conditions. The mean seasonally adjusted duration is also significantly higher for the poorest conditions portfolio than for the best conditions portfolio. Consistent with a negative relationship the mean seasonally adjusted portfolio durations are positive for 3 out of portfolios 1-5 and negative for 4 out of portfolios 6-10.

The results reported in Panel B suggest that expectations of an improvement in business conditions are important to the decision to go public. When the Leading Indicator is at its peak the average spell between IPOs is only 1.49 days. This compares to a mean duration of 4.39 days in the worst leading business conditions. In all the portfolios 5-10 the mean deseasonalised duration is negative and for portfolios 8,9 and 10 this difference is significant.

Panel C presents the mean duration and mean seasonally adjusted duration for ten portfolios compiled on the basis of the relative level of the stockmarket. The results suggest a negative relationship between duration and the position of the market. The

151 To test the significance of differences in the mean durations for the smallest and largest portfolios we compute a t-test assuming unequal variances. We also test the null hypotheses that the mean of the seasonally adjusted durations for each portfolio are equal to zero by a t-test.

mean duration is 4.22 days during intervals of the lowest relative strength and 2.06 days (the lowest found) during strong market conditions. The seasonally adjusted mean durations show a similar negative relationship between the market relative and the spell between IPOs. Portfolios 6-10 all have mean deseasonalised durations that are negative and for portfolios 6,8 and 10 this difference is significant. Figure 8.5c illustrates the declining pattern of deseasonalised and raw duration as the market increases in strength.[152]

152 It also appears in Figure 8.5c that the market relative results are markedly akin to those for the Longer Leading Indicator. This results from a stockmarket index being included as a component series of the Longer Leading Indicator. In October 1993 the yield curve was added to the Longer Leading Indicator in place of the FTA 500 share index (which is now in the Shorter Leading Indicator)

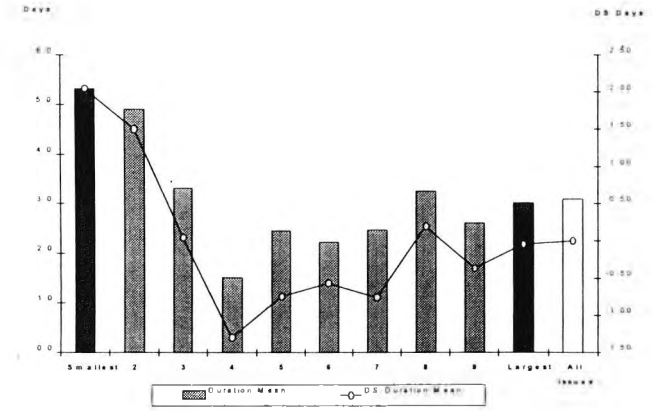
Table 8.3 The effect of business conditions on IPO duration

Portfolio - # of issues	Panel A Coincident Indicator Range	Duration Mean	Deseasoned Duration Mean (t-test)	Panel B Leading Indicator Range	Duration Mean	Deseasoned Duration Mean (t-test)	Panel C Market Relative Range	Duration Mean	Deseasoned Duration Mean (t-test)
Smallest - 127	91.7~93.8	5.31	2.05 (2.66)**	92.2~94.8	4.36	1.08 (1.73) *	1.02~1.13	4.22	1.25 (1.87) *
2 - 126	93.9~96.0	4.89	1.50 (2.87)**	94.9~97.0	3.01	-0.19 (-0.33)	1.13~1.17	3.29	0.25 (0.45)
3 - 126	96.1~98.1	3.31	0.03 (0.05)	97.1~98.5	5.32	2.07 (2.71) **	1.17~1.21	5.13	2.02 (2.66)**
4 - 126	98.2~98.8	1.52	-1.29 (-7.72)**	98.6~100.4	3.77	0.71 (1.73)	1.21~1.24	2.79	-0.28 (-0.91)
5 - 126	98.9~100.6	2.44	-0.74 (-1.75)	100.5~101.9	2.62	-0.47 (-1.08)	1.25~1.30	3.40	0.41 (0.89)
6 - 126	100.7~101.6	2.21	-0.57 (-1.43)	102.0~104.5	3.25	-0.02 (-0.06)	1.30~1.34	2.48	-0.86 (-2.76)**
7 - 126	101.7~103.0	2.48	-0.76 (-2.50)**	104.6~105.3	2.74	-0.17 (-0.36)	1.34~1.37	2.79	-0.60 (-1.71)
8 - 126	103.1~105.8	3.25	0.19 (0.46)	105.4~106.0	2.26	-0.63 (-2.93) **	1.38~1.43	2.33	-0.74 (-2.77)**
9 - 126	105.9~106.7	2.62	-0.37 (-1.38)	106.1~107.0	2.24	-1.06 (-4.05) **	1.43~1.48	2.57	-0.65 (-1.67)
Largest -126	106.8~108.8	3.01	-0.05 (-0.14)	107.1~108.4	1.49	-1.34 (-6.31) **	1.48~1.72	2.06	-0.82 (-2.77)**
All Issues - 1261	100.53	3.11	0.00	101.62	3.11	0.00	1.05	3.11	0.00
Largest-Smallest t-test		(2.73)**	(2.50)**		(4.30)**	(3.67)**		2.89**	2.83**

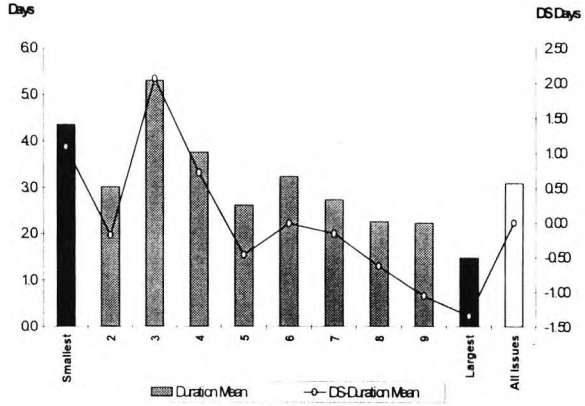
Notes. ** 95% significance for two tail test, * 90% significance for two tail test.

Figure 8.5 The effect of business conditions on IPO duration

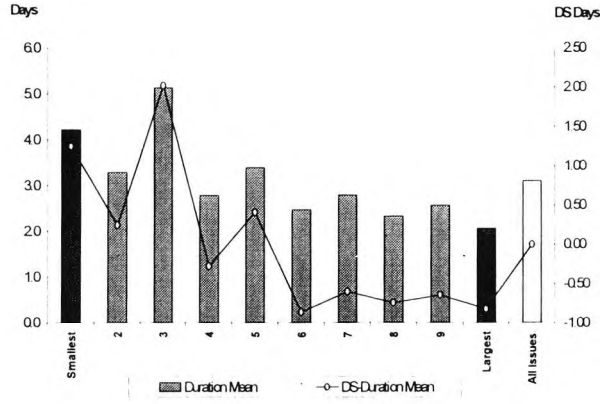
8.5a Coincident Indicator



8.5b Leading Indicator



8.5c Market Relative



b. IPO durations over the business cycle

Because the index values of the Coincident and Leading indicators infer only absolute proximity to a peak or trough, the preceding analysis cannot infer whether IPO activity takes place before or after a turning point in economic conditions. To determine the timing of IPOs in relation to the business cycle the duration of IPOs at different intervals relative to the official CSO turning point dates is analysed.

The months between the dates of a CSO trough and peak are apportioned equally into three stages as shown in Figure 8.6. The 1st upswing occurs after a trough is recorded; the 2nd upswing follows; and the 3rd upswing precedes a peak. Similarly the number of months from the peak to the next trough is broken into 1st, 2nd, and 3rd downswing phases. For example, if there are 30 months between the dates of a CSO defined trough and peak, three ten month upswing stages are defined. If there is a 24 month period untill the next trough three 8 month downswing stages are defined.

Portfolios of IPOs are formed on the basis of the stage of the CSO cycle at the issue date. For each of the six portfolios the mean duration and mean deseasonalised duration are calculated. Additionally the average number of IPOs in each cycle stage is reported.

Figure 8.6 Stages of the CSO business cycle used for the analysis of timing

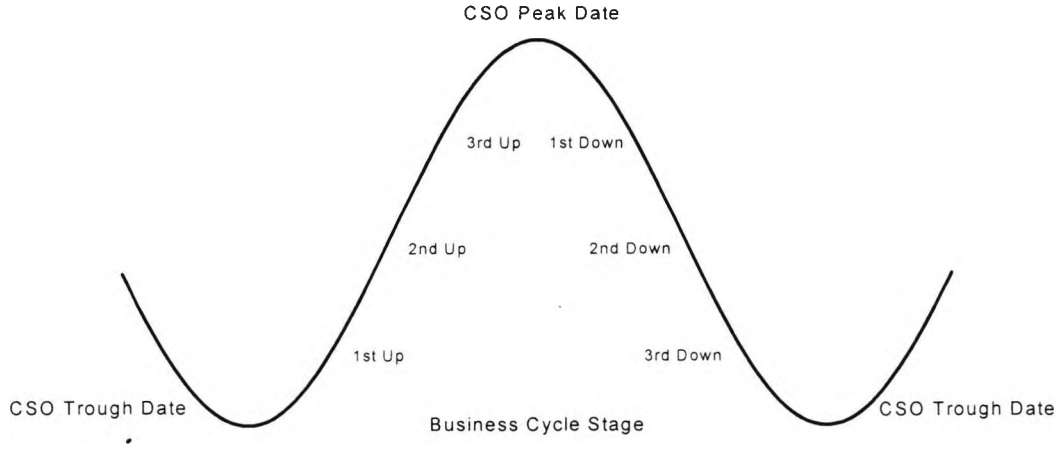


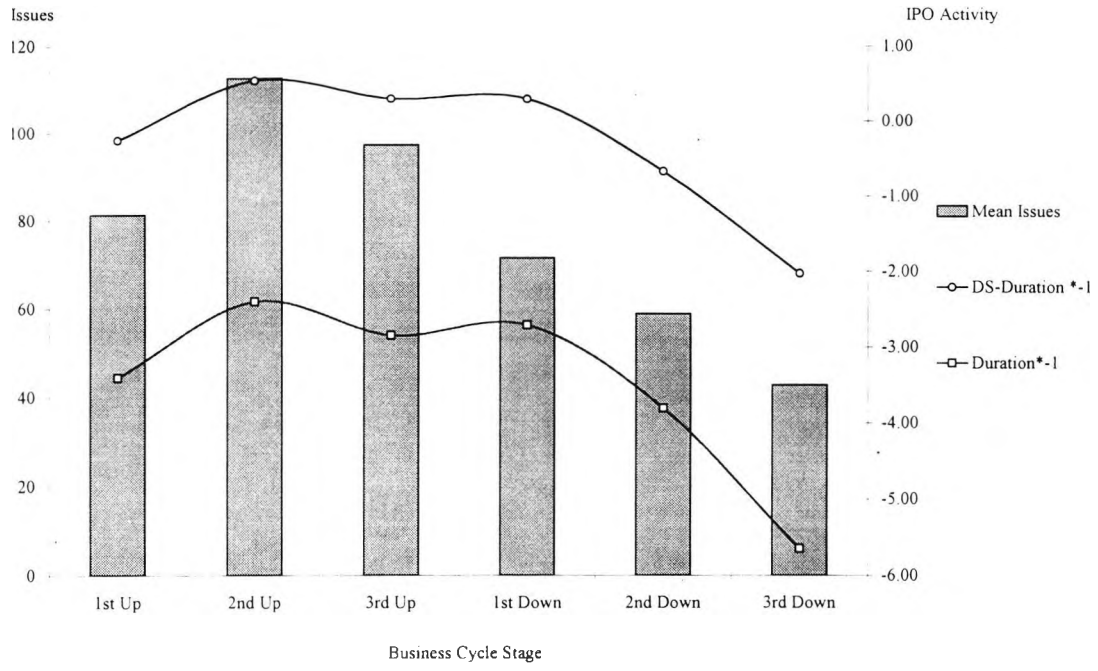
Table 8.4 and Figure 8.7 present evidence of varying issue activity across the business cycle. Preceding a trough IPOs occur once every 5.61 days on average. As the economy begins recovering from a trough the average spell between IPOs is 3.41 days. Activity reaches a high point in the middle phase of a recovery, where IPOs occur on average every 2.4 days. Before and immediately after a peak IPOs occur every 2.85 and 2.71 days on average. As the economy declines toward a trough IPOs arrive every 3.81 days on average. De-seasonalised durations confirm that significantly lower duration occurs in the 2nd upswing stage and significantly higher duration occurs in the 2nd and 3rd downswing stages.

The analysis of IPO durations, business conditions and business cycles stages show an interesting pattern of behaviour by IPO firms. The smallest time between IPOs is found when the CSO Leading indicator is at a peak, the stockmarket level is at a peak relative to its recent past and when the business cycle is in the middle of an upswing. High activity is still found as the cycle enters the first downswing stage. A dramatic decrease in IPO activity occurs as the cycle heads toward a trough, when the CSO Coincident and Longer Leading indicators are at their lowest points and the stockmarket level is low relative to its recent past. These results suggests that managers avoid going public in periods when the immediate economic outlook is poor and equity prices are low, causing quiet periods in the IPO market. As business conditions improve toward a peak and equity prices rise more firms go public.

Table 8.4 IPO duration over the business cycle

Portfolio	Mean Issues	Duration Mean	Deseasoned Duration Mean (t-test)
1st Up	81	3.41	0.26 (0.75)
2nd Up	113	2.40	-0.54 (-2.78)**
3rd Up	97	2.85	-0.30 (-1.36)
1st Down	72	2.71	-0.30 (-1.03)
2nd Down	59	3.81	0.67 (2.03)**
3rd Down	43	5.64	2.03 (1.76)*

Figure 8.7 IPO activity over the business cycle



c. Issue costs and initial returns in IPO Hot issue markets

If firms time IPOs for size economies in issue costs, then those firms that went public in hot issue markets should achieve lower direct costs than those firms that went public in quiet markets. Similarly if firms are attracted by lower adverse selection costs, then those firms that went public in hot issue markets should have lower price increases on the first day. This section investigates whether firms obtain direct and implied cost savings by issuing in hot issue markets.

The analysis of direct and implied costs is based on the comparison of mean costs for portfolios of firms grouped by the mean duration over the last 5 IPO transactions [$m\delta_i$]. The mean duration has the advantage over raw duration of separating the large number of firms that issue within one or two days of a previous IPO.

$$m\delta_i = \frac{1}{5}\sum_{t=0}^{-4} \delta_t \qquad [6]$$

where;
$m\delta i$ = mean duration over the last 5 transactions for IPO *i*
δ_t = duration of IPO *i*

A sample of 1089 non-privatisation IPOs for which first day returns are available is used to test for variations in the implied costs of initial returns. A sample of 484 non-privatisation IPOs for which direct issue cost data is available is used to test the economies of scale hypothesis. As contract type is likely to influence direct issue costs the sample of firms with issue costs is broken down into three sub-samples on the basis of contract type: (i) Placings, (ii) Offers For Sale and combinations of Offers For Sale and Placings, and (iii) Intermediary Offers and Placings.

Ten equally sized portfolios are constructed for the initial returns sample, with the first portfolio containing firms with the smallest mean duration [termed Hot]. The tenth portfolio contains firms with the largest mean duration [termed Cold]. For each portfolio the mean initial return, is calculated. Differences in the mean initial returns of the Hot and Cold portfolios are tested for significance.

Ten equally sized portfolios are also constructed for the Placing-direct-cost sample. The first portfolio contains firms with the smallest mean duration [Hot] and the tenth portfolio contains firms with the largest mean duration [Cold]. For each portfolio the mean direct cost as a proportion of the issue size, is calculated. Differences in the mean direct costs of the Hot and Cold portfolios are tested for significance. Because of the smaller number of firms in the Offers For Sale and Intermediary Offer sub-samples five and three portfolios are formed in these groups, with the first portfolio being Hot and the final portfolios being Cold.

Panels B, C and D of Table 8.5 present the mean direct costs for Placings, Offers for Sale and combinations of Offers and Placements, and Intermediary Offers and Placings. The results in Table 8.5 indicate that firms issuing in Hot markets enjoy an

economically significant saving in direct costs compared to Cold market issuers. Panel B shows the 6.05% mean cost of Placings in Hot market conditions is significantly lower than the 9.34% mean in Cold markets. It appears cost savings exist from issuing in the very cold markets (portfolio 9 and 10) but firms issued in normal market conditions (portfolios 3 to 8) do not exhibit a clear reduction in costs as the mean duration reduces. For example, firms in portfolio 3 have similar mean direct costs (7.81%) as firms in portfolio 8 (7.88%). The results reported for Offers For Sale and Intermediary Offers in Panels C and D also suggest firms pay less for a listing during Hot issue markets. When the market is Cold new issues including an Offer For Sale tranche cost 9.21% on average. During Hot markets Offers For Sale cost only 6.48% on average. Intermediary Offers are the cheapest way to go public with average costs of 4.37% in Hot markets and 6.07% in Cold markets.

The direct cost saving firms achieve by timing issues for active markets as opposed to inactive markets is non-trivial. Firms undertaking Placings reduce their direct costs by more than 35% on average by issuing in Hot markets instead of Cold markets. Issues including Offers For Sale and Intermediary Offers can reduce their costs by 29.6% and 28.0% respectively in Hot markets.

To test the adverse selection cost hypothesis the implied costs from initial returns are investigated. Panel A of Table 8.5 presents the mean initial returns for IPOs over varying market conditions. The results suggest that firms issuing in Hot markets have lower initial returns than firms issuing in other market conditions. In Hot markets IPOs have initial returns of 6.48% on average, which is the lowest average cost of all market conditions portfolios. In contrast to the initial returns in Hot markets, in Cold markets initial returns average 17.48%. There is an average saving to the firm of 11% of the funds raised or 62.3% of the implied cost, compared to Cold market issuers. Less significant savings in initial returns are made by issuing in Hot markets compared to all other market conditions.

The difference in initial returns and direct issue costs between Hot and Cold markets are both statistically and economically significant. The £25 million company issuing

£6.25 million in a Placing, used in our earlier example, would have direct issue costs of £583,750 on average in Cold markets. In Hot markets the costs would be £378,125 on average; a saving of £205,625 for timing the issue. Implied costs in Cold markets are a staggering £1,092,500 on average. In Hot markets the implied costs of initial returns reduce to £405,000; a saving of £687,500. Thus the evidence supports both the adverse selection costs and economies of scale in issue costs hypotheses.

Table 8.5 Direct and implied costs of IPOs

Panel A Initial Returns				Panel B Placings			Panel C Offers and Offer/Placings				Panel D Inter-mediaryOffer/Placings			
Portfolio	Mean Duration	Sample	Mean Initial Return	Mean Duration	Sample	Direct Cost	Portfolio	Mean Duration	Sample	Direct Cost	Portfolio	Mean Duration	Sample	Direct Cost
Hot	0.37	109	6.48%	0.32	28.00	6.05%	Hot	0.46	27	6.48%	Hot	0.35	17	4.37%
2	0.74	109	10.84%	0.67	30.00	7.25%	2	1.01	27	6.91%	Mid	1.53	16	5.42%
3	1.00	109	11.66%	0.97	30.00	7.81%	3	1.48	29	8.99%	Cold	3.76	17	6.07%
4	1.31	109	15.06%	1.24	30.00	7.55%	4	2.52	27	8.42%				
5	1.68	109	14.44%	1.62	30.00	7.72%	Cold	5.18	27	9.21%				
6	2.17	109	10.35%	2.04	30.00	8.96%								
7	2.83	109	14.53%	2.80	30.00	7.29%								
8	3.82	109	9.20%	3.62	30.00	7.88%								
9	5.83	109	11.59%	5.70	30.00	9.20%								
Cold	12.02	108	17.48%	10.54	28.00	9.34%								
Hot-Cold t-test			-3.98**			-2.07**				-1.77*				-1.95*
All Issues		1089	12.11%		296	7.90%			137	8.00%			51	5.28%

d. Analysis of the amount raised by IPOs

The adverse selection cost and size economies in issue costs hypotheses both predict that more firms will go public and more equity will be raised by IPOs when business conditions improve. The purpose of the regression analysis in this section is to test the effect of business conditions and other explanatory variables on the amount of equity raised by IPOs [$\mathbf{R}_t$]. The $\mathbf{R}_t$ series excludes the 38 privatisations and the extraordinarily large IPOs. The non-privatisation series should more closely represent the level of activity of firms in the new issue market.

Where $\mathbf{f}_t$ is the monthly 1995 inflation adjustment factor and $\mathbf{R}_i$ is the nominal amount raised by each IPO, the real value of equity raised by IPOs in any month is computed by the equation below.

$$R_t = f_t . \sum_{i=1}^{n} R_i \qquad [7]$$

The first business conditions regressor is the monthly Coincident Indicator [$\mathbf{BUS}_t$] described in the duration analysis. The second business conditions variable is the ratio of the FT All Share Index to it's three year moving average [$\mathbf{MKREL}_t$].

The first non-business conditions variable proxies for IPO underpricing. This chapter has argued that assuming a fairly efficient market in the valuation of new issues, the initial returns from IPOs represent an implied cost of issuance. Firms should be enticed to the market if expected initial returns are low and repelled if expected initial returns are high. To proxy expected initial returns the average initial returns before the issue month is used. To construct the regression variable the initial return [ip_i] from the offer price [p_o] to the closing price [p_{c1}] of each IPO is first computed.

$$ip_i = (p_{c1}/p_o)-1 \qquad [8a]$$

A monthly time series of equally weighted average initial returns [ir_t] is then compiled.

$$ir_t = \frac{1}{n}\sum_{i=1}^{n} ip_i \qquad [8b]$$

Finally, the regression variable is the equally weighted average of initial returns in the quarter before the issue month of each IPO [$\mathbf{IRQ}_t$].

$$IRQ_t = \frac{1}{\sum_{t=-1}^{-3} n} \cdot \sum_{t=-1}^{-3} ir.n \qquad [8c]$$

The effect of stockmarket volatility on the new issue market is also examined. The asymmetric information timing theory argues that adverse selection costs arise from information asymmetry and uncertainty about prices; both of which are influenced by business conditions. An important factor influencing information asymmetry problems is likely to be the amount of information being released to the market [see for example Dierkins (1991)]. In periods of high information processing prices tend to change more often and volatility should be relatively high [see for example Engle and Ng (1993)]. High stockmarket volatility thus represents lower information asymmetry, resulting in lower adverse selection costs, and therefore increased IPO activity.[153] The volatility of the stockmarket is used to test this hypothesis. Volatility is calculated as the variance of daily continuously compounded returns to the FT All Share index over the month of issue [$\mathbf{V}_t$].

$$V_t = \mathrm{var}_{t=1}^{n}\left[\ln\frac{FTA_{t+1}}{FTA_t}\right] \qquad [9]$$

Before the estimation of regressions the auto-correlations and partial auto-correlations of the dependent series are examined. The natural logarithm of $\mathbf{R}_t$ has significant auto-correlation out to lag 18. Consistent with the earlier findings of seasonal effects in IPO durations, the 12th month auto-correlation coefficients and partial auto-correlation coefficients are significant. To take into account the seasonal and dynamic influences on the dependent variable a 1st order auto-regressive term [R_{t-1}] and monthly dummy variables [D] are included in the regressions. The following unrestricted auto-regressive equation is estimated.

$$R_t = c + z_{2\text{-}12}\, D + z_{13}\, R_{t\text{-}1} + z_{14} BUS_t + z_{15}\, MKREL_t + z_{16}\, IRQ_t + z_{17}\, V_t + e_t \qquad [10]$$

Where:

R_t	= ln of the amount raised in month t, excluding privatisations
c	= constant (January)
D	= Dummy variables, 1 if not January
R_{t-1}	= ln of the amount raised in month t-1, excluding privatisations
BUS_t	= ln of the Coincident Indicator
$MKREL_t$	= ln of the FT All Share index divided by ln of the 36 month average
IRQ_t	= ln of the mean initial return in the quarter before month t
V_t	= ln of the variance of FT All Share index in month t

Table 8.6 reports results for the restricted and unrestricted regression equations. As preliminary investigations indicated heteroskedastic errors, reported standard errors are adjusted using White's (1980b) procedure.[154] In panels 1-5 the real amount raised is strongly correlated to the previous month's activity, with coefficients varying between 0.44 and 0.61 for the R_{t-1} term. In concert with the duration results all regressions pick up the drop off in activity over the January and August-September periods with significantly lower coefficients for these variables than for the other calendar dummies. In the unrestricted estimation explanatory power is high (R^2= 48%) however a large part of the explanatory power derives from the auto-regressive term.[155]

Consistent with the hypotheses the regression results in Table 8.5 suggest the real amount of equity raised by IPOs increases as the relative level of the stockmarket and business conditions improve. The partial regression coefficient on $\mathbf{MKREL}_t$ is positive and highly significant in all the panels. The coefficient on $\mathbf{BUS}_t$ is also positive and significant at the 95% level in all regressions.

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153 An alternate view of stock market activity is that it will proxy uncertainty regarding issue prices. Therefore being negatively related to issue activity. In this test the data is let to decide whether this rationale is correct.

154 As Rt is an aggregated amount raised series, it comprises non-negative observations with some months having zero values. The possibility exists with such data that ordinary least squares estimation will bias coefficients. Even though a small percentage (8%) of months have a zero dependent variable, a robustness check on our results is made by estimating a Tobit regression. The Tobit regression assumes that any months where zero value was raised are observations for which the dependant variable is unobserved. Appendix 8C presents the results from the Tobit regression on the Rt series. The Tobit results appear to be very similar to those from ordinary least square estimation. Business conditions and other explanatory variables have the same sign and similar significance levels. Thus the ordinary least squares results appear to be robust to the slightly censored nature of the data.

155 The 1st order auto-regressive terms, combined with explanatory variables appear to have taken the memory out of the dependant variable. Ljung-Box statistics in Panels 1-3 are insignificant at the 95% level.

In support of the argument that initial returns are a cost of issuance that deters firms from raising equity, a negative relationship is found between initial returns in the quarter before the issue month and the real amount raised from IPOs. In Panel 1 and 2 the initial return variable coefficient is negative and highly significant. As anticipated, the level of information in the stockmarket attracts firms to the IPO market. The volatility variable coefficient is positive and significant. These results are consistent with the importance of adverse selection costs to IPO timing. It is important to realise that these results are found after controlling for business conditions; indicating any variations in business opportunities do not explain the observed relationships.

Table 8.6 Time-series regressions on the real amount raised from IPOs

Dependent Variable = R_{ip} (Excluding Privatistions)	Panel 1 All Variables Coefficient t-statistic	Panel 2	Panel 3	Panel 4	Panel 5	Panel 6
C	-108.87 -3.13**	-105.40 -2.99**	-100.90 -2.80**	-36.61 -2.03**	1.05 0.85	7.15 6.96**
February	2.95 3.43**	2.80 3.13**	2.82 3.16**	3.01 3.11**	3.16 3.14**	1.43 0.93
March	3.83 3.07**	3.71 2.93**	3.61 2.74**	3.74 2.82**	3.85 2.83**	3.00 2.10**
April	3.70 4.69**	3.50 4.23**	3.24 3.94**	3.29 3.51**	3.32 3.39**	3.43 3.00**
May	3.48 4.12**	3.22 3.68**	3.04 3.63**	3.03 3.37**	3.04 3.27**	3.41 2.91**
June	4.13 4.96**	3.87 4.47**	3.70 4.41**	3.64 4.12**	3.67 4.05**	4.03 3.34**
July	3.74 3.96**	3.55 3.74**	3.51 3.77**	3.40 3.52**	3.41 3.45**	4.14 3.79**
August	1.01 1.05	0.92 0.95	0.99 1.00	0.88 0.78	0.87 0.74	1.67 1.30
September	1.43 1.46	1.29 1.29	1.39 1.39	1.40 1.27	1.50 1.32	0.80 0.53
October	4.15 4.94**	4.28 4.68**	4.30 4.74**	4.26 4.46**	4.41 4.39**	3.17 2.39**
November	2.83 2.85**	2.70 2.67**	2.59 2.57**	2.37 2.16**	2.35 2.14**	2.47 1.69
December	3.54 4.04**	3.23 3.57**	3.26 3.77**	3.15 3.46**	3.18 3.41**	2.96 2.32**
Rt-1	0.44 4.49**	0.45 4.43**	0.49 4.92**	0.56 5.69**	0.61 6.45**	
BUS	17.93 3.49**	16.23 3.18**	13.14 2.71**	8.29 2.11**		
MKREL	68.11 3.80**	61.78 3.49**	41.35 2.61**			
IRQ	-7.96 -2.46**	-6.46 -2.03**				
V	0.74 2.86**					
Ljung Box (18)	28.6	28.8	30.1	35.9**	38.3**	286.1**
Adjusted R-squared	0.48	0.47	0.45	0.42	0.41	0.07

Note: Reported standard errors are adjusted for the presence of unknown heteroskedasticity [White (1980b)]. ** = 95% significance.

5 CONCLUSION

This chapter hypothesises that firms go public when IPO costs are lower. This usually occurs when business conditions are good. When business conditions improve firms should prefer IPOs because adverse selection costs are reduced, and because economies of scale in issue costs become available. To test the validity of the two hypotheses several empirical investigations of IPO activity have been undertaken.

The first analysis conducted is of IPO durations. The duration or spell between IPOs is an intuitive measure of IPO activity unused in previous IPO studies. This methodology has the advantage of not relying on the aggregation of data to test predicted relationships and can uncover timing relationships that are masked when using lower frequency data. The duration results reveal important calendar effects in issue activity that have been hitherto unnoticed. In the UK IPO market there are significant day of the week and monthly variations in activity. Monday and Thursday are very popular issue days compared to the rest of the week. January, August and September are extremely quiet periods in the IPO market. These effects appear related to the listing procedures of the London Stock Exchange and the institutional characteristics of the City of London.

To test the hypothesised link between business conditions and issue activity, mean durations of IPOs in varying economic conditions were examined. When the Coincident and Longer Leading Indicators or the relative level of the stockmarket is high, the spell between IPO transactions is considerably shorter than when conditions are poor. The expected time between IPOs is only 3.01 days when business conditions are nearest a peak and 5.31 days when nearest a trough. Time-series regressions on the real amount raised by IPOs confirms the positive relationship between business conditions and IPO activity. More money is raised when the business cycle is near a peak and when the market is relatively high. In the regression analysis further evidence is found suggesting that adverse selection costs deter firms from going public.

The duration and regression results suggest a strong link between business conditions and IPO activity. Another interesting finding from this study is that patterns occur in issue activity across the business cycle. When the economy is in expansionary phases and just following a peak, IPO activity is greatest. When business conditions decline IPOs decline in frequency. Before a trough IPOs are scarce, consistent with firms waiting for lower costs and having fewer positive NPV projects.

To determine the validity of the economies of scale in issue costs and adverse selection hypotheses it was investigated whether firms that went public in hot issue markets achieve cost savings over cold market issuers. The findings for Placings, Offers For Sale and Intermediary Offers all indicate economically significant direct cost savings for hot market issuers. Firms undertaking Placings in hot issue markets pay only 65% of the costs incurred by cold market issuers. Issues including Offers For Sale and Intermediary Offers have similar cost savings. Firms timing issues for hot issue markets obtain even more substantial savings in the implied costs of initial returns. Average initial returns are 6.48% in hot issue markets and 17.48% in cold markets. Thus hot market issuers on average have to leave 60% less equity to subscribing investors than cold market issuers. These results support both the economies of scale in issue costs and adverse selection costs hypotheses.

In conclusion, this chapter reveals that the grouping of IPOs in the UK can be explained largely by seasonal effects and business conditions. This is consistent with the institutional characteristics of financial markets and firms having increased funding requirements in better business conditions. The increase in activity is also found to be related to time varying adverse selection costs and direct issue costs. When asset values are higher the firm reveals less negative information by announcing an equity issue and the implied cost of the initial price increase is less important. Issuing in better business conditions also allows firms to issue more equity to take advantage of size economies in issue costs. These two separate effects cannot both be maximised by firms, because of the necessary trade-off between higher issue size and adverse selection costs. However they do both appear to underlie windows of opportunity for going public.

CHAPTER 9

The Effect Of Property Market Conditions On The Timing Of Property IPOs.[Φ]

1 INTRODUCTION

Chapter 8 hypothesised that the grouping of IPOs in the UK can be explained by the occurrence of windows of opportunity where firms can go public for lower cost. Empirical evidence in Chapter 8 revealed that the time between IPOs and the real value of equity raised by IPOs per month are correlated with: (i) seasonal effects relating to the institutional characteristics of the City of London, (ii) the CSO Longer Leading and Coincident indicators, (iii) the relative level of the All Share index, (iv) expected initial returns, and (v) the volatility of the stockmarket. Chapter 8 also revealed that during hot issue markets economically significant savings in the implied cost of initial returns and direct issue costs are made. The evidence is consistent with the appearance of windows of opportunity. When asset values are higher the firm reveals less negative information by announcing an equity issue. Issuing when asset values are high also allows firms to take advantage of size economies in issue costs.

A hazard with both the adverse selection cost and economies of scale in direct issue cost explanations of financing behaviour is the link between firm value and business conditions. The inexact manner which business conditions are modelled by Choe, Masulis and Nanda (1993) and others, makes empirical testing problematical. If many economic series are tested some would surely be significantly related to IPO activity. Furthermore, it would be unlikely that business conditions are constant across industries all the time. For example, a property firm will not face the same business conditions as an oil exploration company. Variations in industry conditions may be able to explain the evidence documenting industry variations in IPO activity which was reviewed in Chapter 3.

Φ Parts of this chapter are contained in Gerbich (1996).

This chapter determines empirical implications for the business conditions that influence the fundamental value of Property Investment and Property Development IPOs [PIPOs]. Chapter 4 examined the direct link between the value of a Property Investment company's property portfolio and the value of their equity. Although Property Development companies do not have an explicit pricing mechanism relating asset value to share price, their earnings are also dependant on real estate market conditions. Real estate market conditions are therefore expected to influence the value of Property Development IPOs.

At the base of asymmetric information timing models are the intrinsic value of equity and the price after announcement of an equity issue. Choe, Masulis and Nanda (1993) formulate that both of these values depend on the value of projects and assets in place. If we make the simplifying assumption that the assets in place and projects are freehold properties let with regular rent reviews, they can be described in a present value model. Recall from Chapter 4 the model of Adams, Booth and Venmore-Rowland (1993), presented below with the exclusion of non-annual outgoings

$$V_a = \frac{R_1 . a_n^4}{1 - \left[\frac{(1+g)}{(1+i)}\right]^n} \qquad [1]$$

Where: $\mathbf{V_a}$ is the value of a property asset, $\mathbf{R_1}$ is the initial market rental income net of tax and other annual outgoings, **n** is the rent review period in years, **g** is the expected growth in open market rental, a_n^4 is the present value of an annuity of £1pa, paid quarterly in advance for n years, using i, **i** is the investors net of tax required rate of return.

An increase in expected rental growth, market rents or a decrease in the required rate of return will increase the value of real estate assets and therefore the fundamental value of Property Investment and Property Development companies. In the real estate market there will be more positive NPV projects and greater demand for debt and equity to invest in them. Less negative information will be revealed by the

announcement of an equity issue by a property company and the adverse selection costs for the firm will be reduced. Economies of scale in issue costs will also become available to property firms if they maintain a target dilution level. The result of the increasing demand for projects and the lower issue costs is an increase in the number of Property Investment and Property Development IPOs. This rationale is summarised in hypothesis 6.

Hypothesis 6 : Property Market Conditions and property IPO activity
An improvement in property market conditions increases the value of assets in place for property companies. This leads to an increased demand for funds, lower adverse selection costs and potential economies of scale in issue costs for property IPOs. All else equal, property IPO activity will increase.

2 METHODOLOGY AND SAMPLE

a. Sample

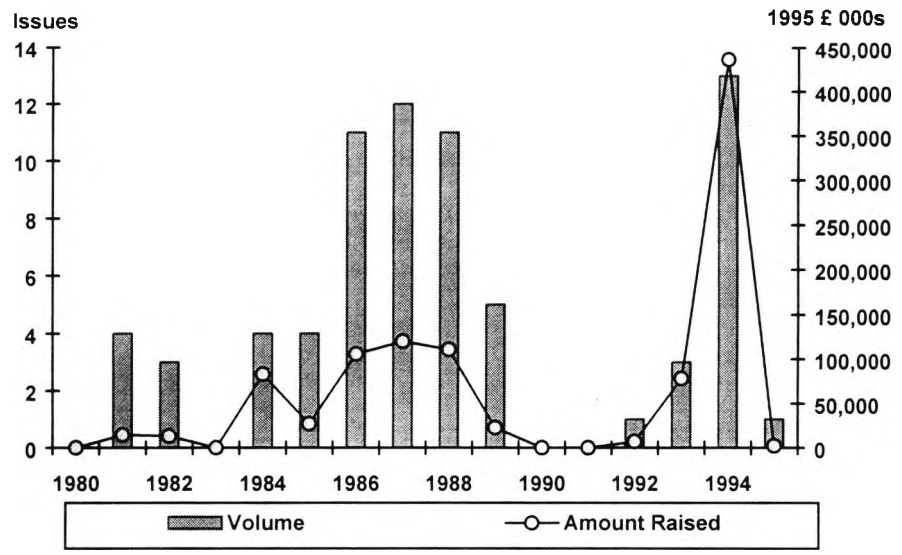
To examine the effect of real estate market conditions on the timing of PIPOs a time series is formed over the 64 quarters between January 1980 and December 1995. A quarterly series is decided as the aggregation frequency as a compromise between the more explicit but often zero filled higher frequencies and the reduced number of observations available from lower frequencies. The sample described in Chapter 6, comprising the 71 Property Investment and Property Development companies listed between January 1980 and December 1994 provides the bulk of the sample. Over the 4 quarters from January 1995 to December 1995 one Property Investment company is added to the sample.

There are considerable variations in the amount of capital raised by PIPOs and the number of issues over time, similar to the patterns in IPO activity. Table 9.1 and Figure 9.1 present the annual volume and amount raised by PIPOs in the sample. Heavy issue periods occur in the mid-eighties and in 1994, with a quiet period during the early nineties.

Table 9.1 Property Investment and Development IPO sample 1980-1995

Year	PIPO Sample	Amount Raised 1995 £ 000s
1980	0	0
1981	4	14,599
1982	3	13,290
1983	0	0
1984	4	82,950
1985	4	26,940
1986	11	105,702
1987	12	120,045
1988	11	110729
1989	5	22,777
1990	0	0
1991	0	0
1992	1	7,059
1993	3	78,354
1994	13	436,547
1995	1	2,300
All	72	1,021,292

Figure 9.1 Property Investment and Development IPOs 1980-1995



b. Poisson methodology

To test the effect of real estate market conditions on the timing of PIPOs the volume of PIPOs is analysed in a Poisson regression. The dependant variable for this analysis is the count of PIPOs per quarter [$\mathbf{y_t}$].

Change in market yield is the first explanatory variable. It follows from equation [1] that (ignoring non-annual outgoings) the required initial yield of a property investment can be represented as;

$$\frac{R_1}{V_a} = \frac{1 - \left(\frac{1+g}{1+i}\right)^n}{a_{\overline{n}|}^{4}} \qquad [2]$$

A decrease in the investors required annual rate of return [i] or an increase in expected real growth in open market rent [g] results in an increase in market value and a decrease in observed initial yields. This increase in real estate values is expected to increase the demand for external capital and increase the proportion of property firms going public. The first variable tested is the change in the Hillier Parker All Secondary Property Yield Index over the quarter of the issue [$\mathbf{Yield_t}$].

$$Yield_t = HPY_t / \ HPY_{t-1} - 1 \qquad [3]$$

Change in market rent is the second explanatory variable. As this variable is included with the change in yield variable in the regression equation it proxies for unexpected changes in rental growth.[156] An unexpected increase in market rents are hypothesised to result in higher market values and therefore more business opportunities, lower adverse selection and economies of scale in issue costs. A positive relationship between PIPO volume and unexpected rent changes is expected. The second real estate market variable is the percentage change in the Investors Chronicle Hillier Parker Rent Index over the quarter of the issue [$\mathbf{Rent_t}$].

[156] The change in initial yield variable will adjust to expected changes in market rent and changes in the required return of investors. Thus the coefficient on changes in rent will represent the effect of unexpected rental changes on PIPO activity. I would like to thank Professor Charles Ward for emphasising this point.

$$Rent_t = HPR_t / HPR_{t-1} - 1 \quad [4]$$

The quarterly variance of daily returns to the FT Property Index [$\mathbf{VPt_t}$] is used to proxy for adverse selection costs. This variable is constructed as per equation 7 in Chapter 8. As in the time series regressions of Chapter 8 this variable is expected to positively relate to PIPO activity.

The equally weighted average of IPO initial returns in the quarter of the issue [$\mathbf{IR_t}$] is used to test the adverse selection cost hypothesis. This variable was chosen instead of a series based on PIPO initial returns because of the dependence of PIPO initial returns on discontinuous PIPO volume. The construction of this variable is based on Chapter 8's equation 6a, with 6b being adapted to quarterly aggregation.

A generalised linear modelling framework is adopted to estimate the regression. The model can be broadly specified in three parts; a probability distribution, a linear regression function and a link function between the first two parts. The probability distribution is a fundamental component of the statistical model because optimal fitting relies on the form of the probability distribution. Following Ljungqvist (1996) it is assumed that the number of PIPOs per quarter follows a Poisson counting process. Let $\mathbf{y_t}$ be a series of observations (counts of PIPOs per quarter) on the random variable **Y.** Thus $\mathbf{y_t}$ are from a Poisson distribution with mean and variance μ_t and probability density as follows;

$$\text{Probability } (Y = y_t) = \frac{e^{-\mu_t} \mu_t^{y_t}}{y_t!} \quad [5]$$

The covariates discussed above appear in the model in a linear structure.

$$\log(\mu_t) = \mathbf{X_t B} \quad [6]$$

Where $\mathbf{X_t}$ is a t x k matrix of k explanatory variables and **B** are estimated parameters. In an attempt to take into account seasonality in the PIPO series quarterly dummy variables are included in the regression. As is common the log-link is used to connect the linear predictor to the mean response μ_t. Additive effects contributing to $\mathbf{y_t}$ become multiplicative effects on μ_t and μ_t is now necessarily positive.[157]

Under these assumptions the log-likelihood function **L** is given by Ljungqvist (1996) as;

$$L = -\sum_{t=1}^{T} \mu_t + \sum_{t=1}^{T} y_t \ln \mu_t - \sum_{t=1}^{T} \ln(y_t!) \qquad [7]$$

The Poisson model is estimated using maximum likelihood procedures. Table 9.2 reports the final fitted equation. Measures of goodness of fit for generalised linear models are usually based on the deviance. The deviance is a scaled likelihood ratio test of the saturated model against the fitted model; the lower the deviance the better the fit.

3 EMPIRICAL RESULTS

Before discussing the results there are some technical issues that need to be addressed. The Poisson model requires identical mean and variance. If the Poisson distribution holds and the regression model is correctly specified, the deviance should be of the same order as the residual degrees of freedom. In our case this test indicates the arrivals of PIPOs are overdispersed.

Practically overdispersion is not too problematic however. McCullagh and Nelder (1989) show that as long as the model is correctly specified and the data have Poisson qualities, overdispersion adjusted standard errors can be obtained. Adjusted standard

157 In classical linear regression the mean and linear predictor are the same and the identity link between the probability distribution and the linear regression function is appropriate in that both the linear predictor and the expected value can take any real value. When we are modelling PIPO counts with the Poisson distribution we must have $\mu > 0$, so the identity function is not attractive.

errors are calculated by multiplying the standard errors from the Poisson model by a scale factor equal to the ratio of the residual deviance to the residual degrees of freedom.

Another important characteristic of generalised linear models is that they assume independence, at least after the partialling of deterministic trends. Ljungqvist (1996) finds considerable auto-correlation in the count of firms going public in the German market, which is removed by the introduction of explanatory variables. After estimating the systematic parameters the Box-Ljung statistic is calculated to check for residual auto-correlation. The model estimated has an insignificant Box-Ljung statistic, indicating the static specification is not problematic.

Consistent with expectations the regression results in Table 9.2 suggest the issue volume of PIPOs increases as direct property market conditions improve. The partial regression coefficients on $\mathbf{Rent}_t$ and $\mathbf{Yield}_t$ are both significant with the predicted signs. A decrease in initial yields or an unexpected increase in rents positively influences the arrival of PIPOs.

The coefficient of $\mathbf{IR}_t$ is negative but insignificant giving only the weakest support to the adverse selection costs argument. A further aberrant finding for the adverse selection costs argument is that the coefficient for volatility of property share returns is insignificant.

The quarterly dummy variables do not appear to be too successful at picking up seasonal variation in PIPO volume. Only the fourth quarter dummy variable is significant, suggesting that October, November and December have higher activity than the first quarter. This is consistent with the monthly IPO activity found in Chapter 8. The variations in issue activity at frequencies shorter than a quarter are masked, highlighting the difficulties of aggregating data into a set period to analyse as a time series.

Table 9.2 Poisson regression of property IPO arrivals in the UK

Dependent Variable = y_t	Coefficient Estimate	Standard Error
Constant (Q1)	-0.68	(0.47)
Q2	0.95	(0.50)
Q3	0.98	(0.50)
Q4	1.09	(0.51)**
Rent	19.70	(5.01)**
Yield	-1.85	(0.86)**
VP	-0.46	(0.92)
INITIAL RETURNS	-0.03	(0.02)
Deviance	78.32	
Scale Factor	1.49	
Box Ljung (8)	12.29	

Note: y_t= the quarterly count of PIPOs, Q = Quarterly dummy variables, Rent = change in ICHP rent index, Yield = change in ICHP yield index, VP = variance of FT property index , IR = mean initial return in the quarter. Standard errors are scaled to adjust for over-dispersion. ** = approximate 95% significance.

4 CONCLUSION

If inter-temporal variation in IPO activity derives from business conditions, then we should be able to explain the IPO activity of specialist industries with industry business conditions variables. This chapter tests whether property market conditions influence property IPO activity.

The results suggest that Property Investment and Property Development IPO volume is sensitive to real estate market conditions. When real estate rents unexpectedly increase or real estate initial yields decrease the number of property IPOs increases. There appears to be a link between industry IPO volume and the fundamental value of firms. The results in this chapter are further evidence of the positive relationship between IPO activity and business conditions; consistent with the presence of windows of opportunity.

CHAPTER 10

Conclusion

1 CONCLUSIONS

The thesis has attempted to address two issues. First, does the special pricing of securitised real estate firms provide insight into the initial returns, long-run performance and timing of IPOs? Second, is inter-temporal variation in IPO activity the result of windows of opportunity that appear in good business conditions?

The theme of the thesis is to use securitised real estate IPOs to gain insight into IPO behaviour. Previous studies have suggested that securitised real estate firms are distinguishable from operating companies because of institutional differences and the fundamental link between the value of securitised real estate firms and the value of the underlying real estate portfolio. Because of their uniqueness researchers have used securitised real estate firms to examine corporate finance decisions and found real estate stocks behave differently from other equities. Chapter 4 revealed that Property Investment companies disclose the current value of their real estate portfolio in their IPO prospectus. This allows Property Investment IPOs to be priced using the adjusted NAV methodology. Chapter 5 argues that the adjusted NAV of a Property Investment IPO is a more accurate estimate of intrinsic value than valuations based on discounted cash flow and comparable firm multiples. Thus it is contended that Property Investment IPO offer prices are more certain than the offer prices of Property Development IPOs.

The relationships between the pre-market valuation, secondary market prices and the intrinsic value of the issuing firm are central to many of the explanations for positive IPO initial returns and long-run performance reviewed in Chapter 3. Underpricing models infer that uncertainty surrounding the intrinsic value of an IPO is the crucial

factor in determining the underpricing discount required by investors and thus the magnitude of initial returns. The cognitive bias explanation for long-run underperformance is based on the idea that investors systematically miscalculate auto-correlated earnings growth resulting in temporary overvaluation at the issue date. The unique pricing methodology of Property Investment IPOs and the differing pricing uncertainty of Property Investment and Property Development IPOs are thus useful characteristics for the investigation of IPO behaviour.

The second issue the thesis addresses is the question of variation in IPO activity over time. Previous studies have shown that IPO issue volume is auto-correlated and hot issue markets exist without periodicity. The number of firms going public appears to be related to stockmarket peaks, business conditions, industry conditions and SEO activity. Chapter 3 discussed previous explanations suggesting that changes in business opportunities and overvaluation timing could underlie variations in IPO activity. This thesis provides an alternate explanation.

Chapter 8 provides an explanation for hot issue markets based on adverse selection costs, direct issue costs and business conditions. In this thesis windows of opportunity exist for going public when there are lower costs incurred in going public. The costs of going public are lower when business conditions and stockmarket prices are high for two reasons. First, adverse selection costs should be lower when business conditions are good. The second reason is that when business conditions improve firms can gain economies of scale in the direct issue costs of going public.

The thesis began in Chapter 2 with a review of the empirical evidence documenting the behaviour of IPOs. The major anomalies identified are; abnormally high average initial returns, long-run underperformance, hot issue markets, and hot return markets. Differences in contract types appear to significantly influence the magnitude of initial returns. Evidence from intra-day price data suggests that the sole beneficiaries of initial returns are the subscribers. Evidence of higher than normal trading volume and narrower than normal bid-ask spreads for IPO shares, in the initial aftermarket, suggest that subscribers are able to trade-out initial profits quickly and cheaply.

Rationing occurs for issues with high initial returns and small issues have higher than average initial returns. Thus, the evidence suggests that gross proceeds weighted returns and allocation conditional returns to investors are substantively less than equally weighted returns. Key findings for later chapters are identified in Chapter 2. REIT IPOs have lower first day returns than operating company IPOs. Pricing uncertainty is a positive influence on initial returns. Despite the insightful findings securitised real estate firms provide for the initial return literature they have been excluded from long-run performance studies. Aggregate IPO volume is related to stockmarket and business conditions and SEO activity.

Chapter 3 evaluated the literature explaining IPO behaviour. Underpricing models infer that uncertainty surrounding the intrinsic value of an IPO, and various information asymmetry problems, determine the magnitude of initial returns. In contrast to the equilibrium models explaining positive initial returns, rational explanations of hot issue markets and long-run underperformance are difficult to find. This chapter concludes that cognitive bias is a possible reason for long-run underperformance. It is also concluded that market imperfections that vary with business conditions are a promising explanation of IPO activity.

Chapter 4 examined the institutional structure of the UK IPO market. This chapter summarises: the basic conditions for listing, the role of the sponsor, the importance of the prospectus in the listing process, and the contract choices available to firms. The choice of issue method is narrowed down in practice to either a Placing or an Offer For Sale. The main difference between listing a Property Investment or Property Development company and a non-property company is the requirement to provide a detailed portfolio valuation in the prospectus. The literature documenting the direct costs of obtaining a public listing is also reviewed in this chapter. The direct costs of IPOs are greater than those of other financing arrangements and economies of scale have been found in IPO issue costs. Empirical evidence in this chapter suggest that going public is a costly financial event for a property company to undertake. Direct costs are sensitive to both contract type and the size of issue. It would not be unusual for direct costs to total greater than 9% of a property IPO's gross proceeds.

Chapter 6 has shown that Property Investment IPOs have more certain prices than Property Development IPOs. Property Investment IPOs are issued at prices near their adjusted NAV in all market conditions. Property Investment IPOs typically have lower volatility of returns and residual risk in the early aftermarket than Property Development IPOs. Consistent with the difference in pricing uncertainty Property Investment IPOs have significantly lower average initial returns than Property Development IPOs. These results support the pricing uncertainty explanation of lower initial returns for closed end funds and REITs of Peavey (1990) and Below, Zaman and McIntosh (1995). There appears to be a real estate characteristic affecting the initial returns of securitised real estate IPOs.

Empirical evidence reported in Chapter 6 suggests that Property Investment IPOs are efficiently priced in the secondary market. On average there is no significant difference between the DNAV of Property Investment IPOs and the Warburgs SDNAV at the close of the first day. Evidence from varying market conditions also suggests that at the end of the first day Property Investment IPOs are typically priced in accordance with the Warburgs SDNAV. There is no evidence that Property Investment IPOs are overvalued in market conditions associated with potential overoptimism. These results are in favour of the undervaluation-market efficiency explanation of hot return markets and contradict the existence of overoptimistic periods for these specialist IPOs. The secondary market does a reasonably good job in valuing new Property Investment firms, consistent with the relatively low initial returns found for these IPOs.

Chapter 7 compared the post IPO and rights issue adjusted performance of Property Investment companies, to the adjusted performance of Property Development equity issuers. A comparison of CAR and Holding Period returns confirms that Property Investment companies perform considerably better following an IPO or rights issue than Property Development companies. It is also found that negative mean abnormal returns exhibited by Property Investment equity issuers are indistinguishable from zero at conventional levels of significance. When the Property Investment IPO and

rights issue samples are combined average monthly performance results still indicate normal performance. Pooled cross-sectional results also indicate average performance indistinguishable from non-issuers; over the entire study period, and also in sub-periods. In contrast to results from studies of operating firms, this study of Property Investment companies following IPOs and rights issues, provides no significant evidence of underperformance. Hence there appears no reason for investors to be wary of securitised real estate equity issues.

The aftermarket performance of Property Investment and Property Development equity issuers suggests that pricing uncertainty and cognitive bias influence underperformance. To test the cognitive bias theory the performance of Property Investment and Property Development equity issuers under various issue date conditions were examined. Earnings patterns were also investigated to test the predictions of the cognitive bias hypothesis. Weak evidence is found that Property Development equity issuers conform to the patterns predicted by cognitive bias. Property Investment firms issuing equity appear not to be susceptible to cognitive bias. They have stable earnings similar to the earnings of non-issuing firms before and after issue, and the adjusted performance of Property Investment firms does not depend on market conditions. The similar long-run performance of IPOs and rights issues documented in this chapter is consistent with Affleck-Graves and Page's (1995) contention that periods of long-run underperformance and high issue activity are not necessarily caused by deliberate overvaluation timing.

Chapter 7 also undertakes the first non-US examination of the influence firm specific characteristics have on securitised real estate returns. Regression analysis of property stocks over the period 1984 to 1994 confirms that neither book-market nor size characteristics are associated with new issue effects in the UK property share market. The evidence shows that larger property companies have significantly outperformed smaller property companies over the last 11 years.

The results of Chapter 6 and 7 have confirmed that securitised real estate IPOs behave differently from other IPOs. The empirical analyses of Property Investment and

Property Development IPOs in the thesis have provided insight into the behaviour of IPOs: (i) The difference in pricing uncertainty between Property Investment IPOs and Property Development IPOs results in differing initial performance, as predicted by Rock (1986) and Beatty and Ritter (1986). (ii) Property Investment IPOs are valued similarly to seasoned Property Investment companies in the early aftermarket, consistent with the efficient markets hypothesis. (iii) The difference in pricing uncertainty between Property Investment IPOs and Property Development IPOs results in differing adjusted long-run performance, as predicted by the cognitive bias hypothesis of Loughran and Ritter (1995b). (iv) Real estate market conditions determine the number of Property Investment and Development firms deciding to go public, as predicted by windows of opportunity.

The second part of the thesis, the explanation of inter-temporal variation in IPO activity, begins in Chapter 8. The windows of opportunity theory predicts that better business conditions result in weaker adverse selection costs, and potentially lower direct issue costs. Several implications of the adverse selection costs and direct issue costs hypotheses are subject to empirical examination in this chapter. It is investigated whether UK IPOs cluster near peaks in business conditions (to achieve lower costs) and are scarce near troughs (as firms wait for windows of opportunity). Principle predictions of the two hypotheses are that hot issue market firms have lower average initial returns and direct issue costs compared to cold market issuers. A further implication of the theory is that if the timing of IPOs derives from business conditions then industry business conditions should be able to explain the issuance behaviour of specialist industries.

The sample of 1261 firms used to test the windows of opportunity hypotheses in Chapter 8 is the largest sample of IPOs examined outside the US, and provides considerable empirical evidence of the characteristics of the UK IPO market. Using duration (the spell between IPO transactions) for the first time in the IPO literature important calendar effects in issue activity are revealed. Monday and Thursday are very popular issue days compared to the rest of the week. January, August and September are found to be extremely quiet periods in the UK IPO market. These

effects appear to be directly related to the listing procedures of the London Stock Exchange and the institutional characteristics of the City of London.

To test the hypothesised link between business conditions and issue activity, mean durations of IPOs in varying economic conditions were examined. When the CSO Coincident and Longer Leading Indicators or the relative level of the stockmarket is high, the spell between IPO transactions is considerably shorter than when conditions are poor. Time series regressions on the real amount raised in IPOs confirms that more money is raised when the business cycle is near a peak and when the stockmarket is relatively high. Patterns are also found in issue activity across the CSO defined business cycle. When the economy is in expansionary phases and just following a peak, IPO durations are lowest. When business conditions decline IPOs decline in frequency. Before a trough IPOs are scarce. These results confirm that IPO activity is positively related to business conditions.

To determine the validity of the economies of scale in issue costs hypothesis it was investigated whether firms that went public in hot issue markets achieve cost savings over firms that went public in cold issue markets. The findings for Placings, Offers for Sale and Intermediary Offers indicate direct cost savings for hot market issuers. Firms undertaking Placings in hot issue markets pay only 65% of the costs incurred by cold market issuers. IPOs via Offers For Sale and Intermediary Offers have similar cost savings.

The validity of the adverse selection cost hypothesis was tested by examined mean initial returns of firms that went public in hot issue markets. Firms timing issues for hot issue markets are found to be associated with low initial returns. Hot issue market IPOs on average have to leave 60% less equity to subscribing investors than cold issue market IPOs. Furthermore, time series regression results indicate that high initial returns deters firms from going public and increased information flow attracts firms to the market. This suggests that information asymmetry and adverse selection costs deter firms from going public as predicted by the windows of opportunity theory.

Chapter 9 provides further evidence from a Poisson regression that IPO activity is linked to business conditions. Property Investment and Property Development IPO activity is found to increase following an unexpected increase in real estate market rents or a decrease in real estate initial yields. The results in this chapter suggest that variations in industry business conditions is a possible explanation for variations in industry IPO activity.

2 FUTURE RESEARCH

Among the many questions which have been uncovered in the research of the thesis I would like to single two out for the attention of future researchers. First, are the results of Chapter 6 transportable to operational equities? The results in the thesis suggest that the secondary market does a reasonably good job in pricing Property Investment IPOs but it may be the case that only IPOs with a degree of pricing certainty are priced correctly in the secondary market in all market conditions. Firms with more pricing uncertainty could be subject to periods of overvaluation when markets are rising. An empirical investigation of the relationship between the DCF and comparable firm valuations and the first day prices of IPOs would give considerable insight into the interpretation of initial returns.

Second, does the aftermarket performance of IPO firms depend on the spell between firms at the issue date? It is probable that when a large number of IPOs come to the market investors gradually learn the intrinsic value of new firms and face diminishing uncertainty about intrinsic values. When there is a large spell between IPOs, investors do not have recent data to base valuations on and face more uncertainty as to the true value of IPOs. If pricing uncertainty and cognitive bias cause long-run underperformance, holding all else constant there should be a negative relationship between duration and aftermarket performance. Previous research has examined the influence of activity at the issue date on IPO long-run performance using aggregated

volume or value variables. Future research may find more precise and interesting results using duration as the measure of IPO activity.

I am sure the continuing flow of research examining IPO behaviour will result in several of the anomalies uncovered in this thesis finding rational explanations. There may also be parts of IPO behaviour which are proven to result from irrational behaviour. The last three decades of IPO literature suggest that despite the in-roads of theoretical and empirical researchers there will be many opportunities for imaginative IPO research in the future.

APPENDICES

Appendix 7A: 5 year performance of Property Investment and Development Co's

Table A7A 60 month CARs of Property Investment and Development IPO and RT's

	Sample	NON-ISSUERS [Portfolio matched by industry and activity]		PROPERTY SHARES [FT Property]		DIRECT PROPERTY [JLW]		SMALL FIRMS [HG1000]		ALL SHARES [FT All Share]	
	Inv~Dev	Investment	Dev	Inv	Dev	Inv	Development	Inv	Dev	Inv	Dev
		CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat	CAR% t-stat
PIPOs	7~24	-12.04 (0.28)	-122.12 (4.22) **	4.31 0.11	-135.80 (5.61) **	24.90 0.60	-151.82 (5.82) **	-88.74 (1.16)	-160.51 (5.23) **	-31.45 (0.79)	-188.60 (7.69) **
PRTs	18~17	-28.88 (1.17)	-80.83 (2.13) **	-26.66 (1.30)	-84.73 (2.95) **	-41.40 (1.86) *	-104.33 (3.15) **	-31.59 (0.78)	-101.26 (3.14) **	-76.63 (3.66) **	-131.51 (4.45) **

Notes: TableA7A excludes first partial and announcement month adjusted returns. CARs are calculated from equation [5] for 60 months. t-statistics under CARs are calculated from equation [5a], ** 95% significance for two tail test, * 90% significance for two tail test.

Appendix 8A: The monthly arrival and value of UK IPOs

Figure A8A1 The monthly arrival of UK IPOs

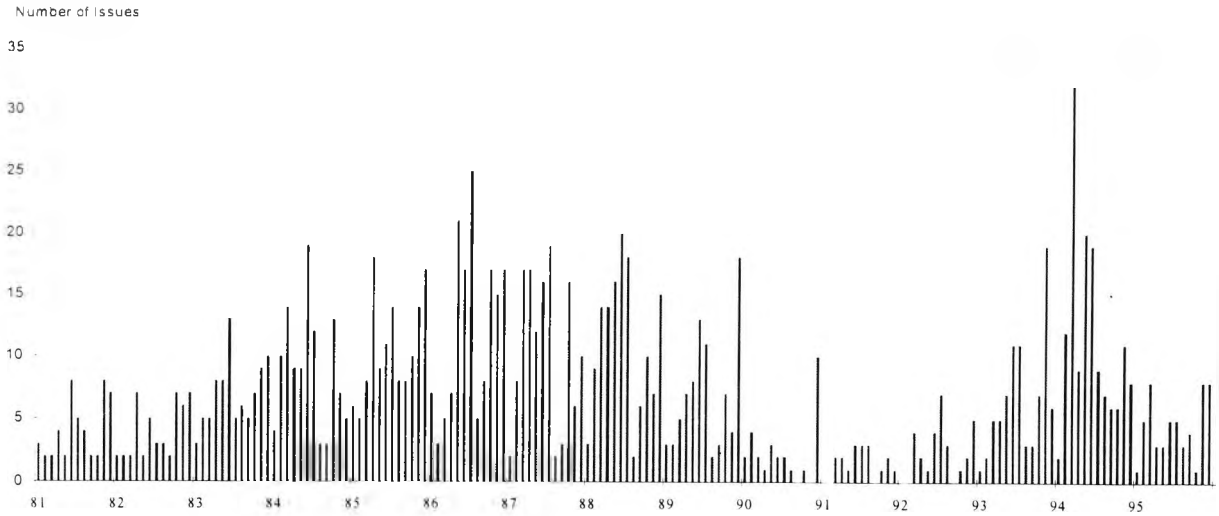
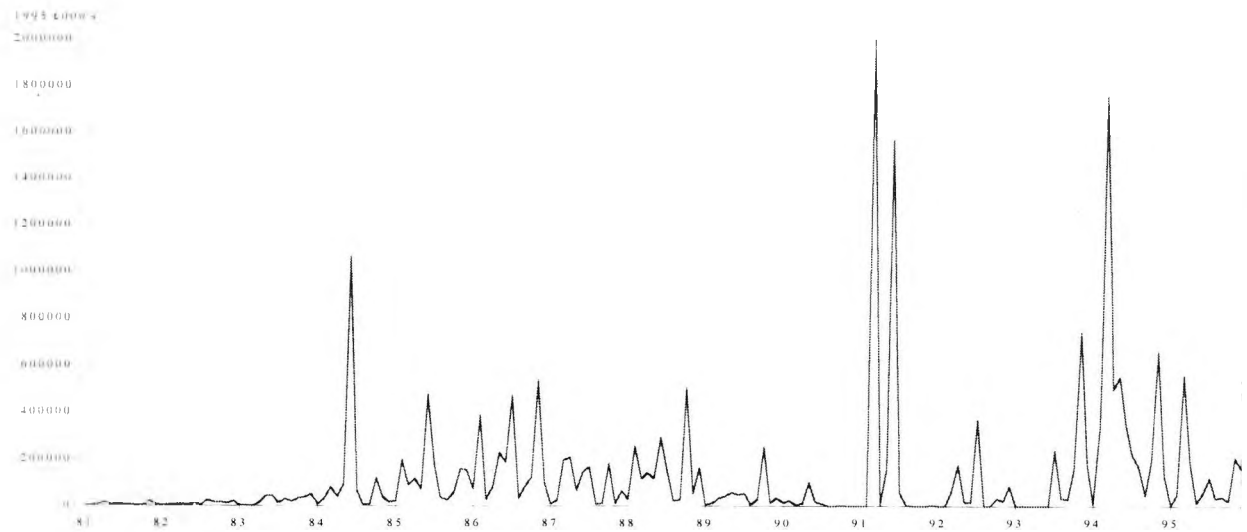


Figure A8A2 The Amount Raised by IPOs (Inflation adjusted and excluding Privatisations)



Appendix 8B: Excluded Privatisations and one off extraordinary IPOs

Table A8B: Excluded Privatisations and one off extraordinary IPOs

Name	Birth
Jaguar	10-Aug-84
British Telecom	3-Dec-84
TSB	10-Oct-86
British Gas	8-Dec-86
British Airways	11-Feb-87
Rolls-Royce	20-May-87
BAA	28-Jul-87
Eurotunnel	10-Dec-87
British Steel	5-Dec-88
Abbey National	12-Jul-89
Norhumbrian Water Group	12-Dec-89
Wessex Water	12-Dec-89
South West Water	12-Dec-89
Welsh Water	12-Dec-89
Southern Water	12-Dec-89
Yorkshire Water	12-Dec-89
Anglian Water	12-Dec-89
Severn Trent	12-Dec-89
North West Water Group	12-Dec-89
Thames Water	12-Dec-89
South Wales Electric	11-Dec-90
Northen Electric	11-Dec-90
South Western Electric	11-Dec-90
Seeboard	11-Dec-90
Norweb	11-Dec-90
Yorkshire Electricity	11-Dec-90
Midlands Electricity	11-Dec-90
East Midlands Electricity	11-Dec-90
London Electricity	11-Dec-90
Eastern Electricity	11-Dec-90
Southern Electric	11-Dec-90
Manweb	11-Dec-90
Powergen	12-Mar-91
National Power	12-Mar-91
Scottish Hydro-Electric	18-Jun-91
Scottish Power	18-Jun-91
Mfi	17-Jul-92
Brittish Sky Broadcasting Group	15-Dec-94
Total	

Appendix 8C Tobit regression results of the value raised by IPOs

Table A8C Tobit regression results of value raised by IPOs

Dependent Variable = R_{tp} (Excluding Privatistions)	Coefficient	t-statistic
C	-119.24	-4.03
February	3.20	3.16
March	4.15	4.19
April	4.02	4.05
May	3.78	3.81
June	4.44	4.47
July	4.00	4.06
August	1.20	1.21
September	1.55	1.56
October	4.47	4.48
November	2.94	2.96
December	3.89	3.91
Rt-1	0.48	6.48
BUS	19.21	4.01
MKREL	75.17	4.37
IRQ	-8.65	-2.98
V	0.79	2.35
Observations	168	
Percent positive observations	0.92	
Std.dev of residuals [sigma]	2.56	[17.07]
Ljung Box (18)	24.2	
Lung-Box on squared residuals	28.1	

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