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Private placements of equity and transactions with existing blocks of shares: evidence from UK listed companies

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2010

Declaration

This is to certify that:

(i) This thesis has been composed by the candidate and is the candidate's own work.

(ii) The work has not been submitted for any other degree or professional qualification.

1/11/2010

Dionysia Dionysiou
Ph.D. Candidate

Date

Growing in Spirit

"He who hopes to grow in spirit
will have to transcend obedience and respect.
He'll hold to some laws
but he'll mostly violate
both law and custom, and go beyond
the established, inadequate norm.
Sensual pleasures will have much to teach him.
He won't be afraid of the destructive act:
half the house will have to come down.
This way he'll grow virtuously into wisdom."

Constantine P. Cavafy (1863-1933 AC)

Abstract

Prior studies suggest that theories on equity offerings applicable to the US are not always applicable to the UK. Further, to my knowledge, little evidence exists on pure UK private placings and, no evidence on blocks of already listed shares (secondary offers). This study considers this lack of evidence and contributes to the extant literature by investigating these two types of equity offerings. More specifically, the study focuses on three main themes: the placing offered discount or premium, the long-run abnormal performance surrounding the offers and, whether the US puzzling reversal of private placement abnormal returns (*AR*) is also valid in the UK.

With regards to the first theme, OLS analysis suggests that information costs and liquidity costs are the main determinants of the discount of private placements. Concerning the secondary offerings, they are also mainly priced at discount. However, the secondary offering discount appears to reflect uncertainty about the stock value. The findings contradict the US evidence that imply stonger monitoring costs, especially for the secondary sample. Premiums reflect extraction of private benefits, regardless of the offer type.

Regarding the second theme, the performance of private placing firms peaks at the offer year and turns negative few years later. The findings suggest the firms time the offer when the stock is overvalued and indicates high selling growth opportunities. While the findings for secondary offers suggest post-offer underperformance, the firms also engage into downwards earnings management the year before the offer. These factors explain the post-offer underperformance.

Finally, concerning the third theme, the reversal is also observed in the UK. However, when liquidity and pre-event momentum risk factors are taken into account, the post-offer underperformance disappears. The findings strongly suggest that the traditional models used to measure long-run *AR* are misspecified. They are unable to adjust for reduction in liquidity risk which changes the risk factor loadings. Hence, the reported *AR* are downwards biased.

As a conclusion, the study adds to the body of knowledge within the equity offerings area. It also contributes to theories such as signalling, agency and market efficiency. Finally, it provides methodological suggestions.

Dedication

This thesis is dedicated to my parents,
Athina and Charalambos

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Abbreviations

AR	: Abnormal Returns
AMEX	: American Stock Exchange
BTM	: Book-to-Market ratio
BD	: Bought Deals (firm commitment offers)
BHAR	: Buy and Hold Abnormal Returns
CAPM	: Capital Asset Pricing Model
CAR	: Cumulative Abnormal Returns
Carhart-4factor	: Carhart (1997) four factor model
CFA	: Cash Flows (operating) on Assets
CFS	: Cash Flows (operating) on Sales
CTAR	: Calendar Time Abnormal Returns
DCAC	: Discretionary Current Accruals
DLAC	: Discretionary Long-term Accruals
EGM	: Extraordinary General Meeting
FF-3factor	: Fama and French (1993; 1995) three factor model
FSA	: Financial Services Authority (UK)
FSAMA	: Financial Services and Markets Act (2000)
HML	: High Minus Low portfolios (growth factor)
IPO	: Initial Public Offerings
LIQ	: High minus low liquidity portfolios (liquidity factor)
LQT-2factor	: Liu (2006) two factor model
LSE	: London Stock Exchange
MV	: Market Value of Equity
NDCAC	: Non Discretionary Current Accruals
NDLAC	: Non Discretionary Long-term Accruals
NYSE	: New York Stock Exchange
OO	: Open Offers
PALs	: Provisional Allotment Letters (rights)
PP	: Private Placements
PR1YR	: Winners minus Losses portfolios (momentum factor)
RI	: Right Issues
ROA	: Return on Assets
ROE	: Return on Sales
SEC	: Securities and Exchange Commission (US)
SEO	: Seasoned Equity Offerings
SGTH	: Sales Growth
SMB	: Small Minus Big portfolios (size factor)
UK	: United Kingdom
US	: United States

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1.1. Motivation

The current study is about Seasoned Equity Offerings (SEO). It focuses on placements of equity by UK listed companies, when existing shares do not maintain pre-emptive rights to subscribe for the offer prior to its public announcement. Two non pre-emptive equity offering samples are used, i.e. private placements and transactions with blocks of already listed shares. The motivation of this study derives from the lack of (adequate) evidence with regards to the two particular equity offering types. In addition, different implications are associated with the UK SEO in comparison to the US, which provides additional interest to identify whether the theories developed mainly based on US models are applicable in the UK.

More specifically, evidence suggests fundamental differences between the two countries, in terms of SEO institutional settings, market reactions and participant incentives. Although the two countries are Anglo-Saxon and considered as developed with similar regulatory systems (La Porta et al., 1998), they have significant differences in their equity offering regulations and institutional settings. A few differences are listed as follows.

Equity offering methods in the UK are subject to pre-emptive rights which protect the stakes of existing shareholders from dilution. In fact, under the Companies Act 1985, a company is 'not permitted to offer shares without firstly making the offer to existing shareholders, on similar or more favourable terms, on a pro-rata basis.' Disapplication of pre-emptive rights is now allowed under certain conditions. Contrary, in the US, a new issue is first bought by an underwriter who subsequently resells the shares at a higher price to investors, without a pro-rata offering (i.e. firm commitment offers). Firm commitment offers are the main issue method in the US (Eckbo et al., 2007; Slovin et al., 2000; Armitage, 1998) while the main UK offer

method is an open offer accompanied by a placing (Armitage, 1998; Slovin et al., 2000; Barnes and Walker, 2006). Few right issues also exist.

Second, the process of offering shares is different in the two countries, with the US setting to allow for more flexibility from the companies point of view. In particular, the offered price and characteristics in the UK are set at the evening prior the announcement day and cannot be altered, regardless of the subsequent market reactions (Slovin et al., 2000; Armitage, 1998). Contrary, in the US, the underwriter has the opportunity for a road-show. During the offer period, the offer price and size can be adjusted according to the demand and market reactions (Eckbo et al., 2007). Thus, the underwriter risk in the US is lower.

Moreover, the disclosure requirements in each country are also different. Securities and Exchange Commission (SEC) reporting companies in the US are required to publish the placing agreements which include all placing characteristics. However, the UK firms conducting private placements are not obliged to publish a prospectus or other official placing agreement, unless the offered size is above the 10% of the shares outstanding (according to the 2000 Companies Act). It is thus plausible to argue that not only the UK provides less flexibility but it also allows for higher asymmetric information.

Because of the lack of flexibility when arranging the deal characteristics in the UK, different market reactions to the issue types and different needs for underwriting are implied (Slovin et al., 2000; Armitage, 2002). The analogous signals sent by US offerings are opposite (Eckbo and Masulis, 1992), e.g. negative market reactions for commitment offers in the US but positive for UK open offers and placings. This strongly suggests that the implications deriving from signalling and agency theories differ in the two countries. The models developed by the US literature are not always applicable in the UK (Slovin et al., 2000; Kotweger and Reneboog, 2002; Armitage, 2002).

Finally, the US literature provides evidence on pure private placements (Wruck, 1989; Hertzel and Smith, 1993; Hertzel et al., 2002; Barclay et al., 2007; Wruck and Wu, 2009) and on placements with already listed block of shares initiated by existing

shareholders (Barclay and Holderness, 1989; Bethel et al., 1998; Allen and Philips, 2000; Allen, 2001). Contrary, UK findings on non pre-emptive offers are in fact at elementary stage. The majority of the articles examining SEO in the UK, mainly focus on the market reactions around rights and open offers (see Slovin et al., 2000; Barnes and Walker, 2006; Armitage, 2002). Extensive research has been aiming the understanding of the choice among the equity offer types and resolving the right offer paradox, i.e. why open offers and/or firm commitments have been replacing right issues (among others see Hansen, 1988; Eckbo and Masulis, 1992; Slovin et al., 2000; Armitage, 2007). Yet, to my knowledge, evidence on UK placings of blocks with already listed shares is non-existent.

Thereby, the lack of adequate evidence on non pre-emptive equity offerings and the different settings and implications of the UK market, raise questions on whether the US patterns and theories on these two offering types (private placements and transactions with blocks of listed shares) are also applicable in the UK. These issues provide a motivation for deeper investigation of these two samples in the UK.

1.2. Aims of the study and research objectives

1.2.1. Aims of the study

The main purpose of the current study is to reduce this gap into the literature. The study seeks to understand the UK market with regards of these types of equity offers and to investigate the validity of arguments derived from the US literature in terms of the offered price, announcement reactions and abnormal performance. It also examines whether there are differences between the two UK offering types. The two samples are referred by this study as primary and secondary placings, respectively. Four main research objectives are examined, as follows.

1.2.2. Research objectives

Obj.1: To identify the main determinants of the offered discount or premium of UK non pre-emptive equity offerings.

Evidence suggests that SEO are offered at large discount to the prevailing market price prior to the event. This holds for various SEO types across countries such as US commitment offers and private placements, UK SEO, Swedish, Greek, New Zealand, Japan, Netherlands and others (see section 2.3.3 for relevant literature). Contrary, US evidence on existing block of shares report that investors might be willing to pay premium to gain private benefits (Barclay and Holderness, 1991) or to be active and improve firm value (Barclay et al., 2007).

There is no doubt that the discount (or premium) has a significant impact on the cost of issuing shares. In fact, the discount of SEO consists of one of the largest indirect costs for an issuing firm (see Armitage, 2002; Hansen, 1986), if not the biggest indirect cost of selling equity (Eckbo et al., 2007). This pinpoints the need to understand the relevant implications in more depth. Additionally, there is large heterogeneity in UK SEO valuations (Armitage, 2010). Examining the discount or premium of the UK offers (where inadequate evidence exists and different settings lead to frequent inapplicability of the US models) facilitates in understanding the pricing techniques which have substantial impact on firm value.

Obj.2: To assess the long-run abnormal performance surrounding non pre-emptive equity offerings and explain its potential driving factors.

Evidence suggests that SEO firms underperform their benchmarks few years after the event. This is consistent across countries and SEO types, e.g. US public offers and private placements, UK rights and pre-renounced rights, UK open offers and offers accompanied by placings, Dutch rights, Korean SEO, Japanese right issues and private placings (see section 2.3.5 for relevant literature). At the same time, the placing firms document over-performance the years before the offer (e.g. Loughran and Ritter, 1997; Teoh et al., 1998; Hertzel et al., 2002; Iqbal et al., 2009).

Contrary, evidence about transactions with existing blocks of shares in the US reports post-purchase overperformance (e.g. Bethel et al., 1998; Allen and Philips, 2000). These studies, however, document past-performance which is not towards specific direction. Firms chosen by active investors underperform prior the event

(Bethel et al., 1998) whereas those chosen for corporate alliances and joint ventures overperform (Allen and Philips, 2000). Thus, different incentives are involved.

The reason to investigate the long-horizon abnormal performance the years surrounding the two non pre-emptive placing samples is twofold. Similar investigation for UK non-preempitve offerings is sparse, whilst the UK settings on investor activity do not hold (see Armitage, 2010). Hereby, different *AR* paths associated with different incentives are plausible.

Obj.3: To review the long-run abnormal performance methods and assess whether including (il)liquidity as a risk factor facilitates in improving the method of measuring expected returns.

The intuition behind the third research objective is related to prior literature which debates about the proper approach of measuring long-horizon abnormal returns. The asset-pricing model designed to identify mispricing (Fama and French, 1992; 1993) cannot precisely value the cross-section variation of expected returns (Mitchell and Stafford, 2000). It appears that it overestimates the average returns during the sampling period, mainly for small, low book-to-market securities. This, along with the several econometric problems that abnormal returns are subject to, consists of the known bad model problem (Fama, 1998).

Considering the interest of this study to examine the long-run abnormal performance surrounding the two events, the bad-model problems stress out the need to understand the various issues related to each approach. If possible, the third objective aims to suggest new methods or solutions on how to improve the extant literature.

Obj.4: To examine whether the announcement and long-horizon abnormal returns for the UK private placements reverse, similar to the US evidence. If so, to examine potential explanations.

The fourth research objective builds upon prior findings for private placements. Evidence suggests that the market reacts positively to the announcement (Wruck, 1989; Hertzel and Smith, 1993; Barclay et al., 2007) but turn negative few years later

(Hertzel et al., 2002; Barclay et al., 2007; Sheehan and Swisher, 1998; Kang et al., 1999). The main explanation provided is that investors overreact at the announcement (Hertzel et al., 2002). However, this interpretation implies systematic miss-valuations and market inefficiency, i.e. investors are not able to understand the real implications of the private placements and overreact.

Additionally, such evidence is unclear for the UK market. UK studies examining UK placings such as Slovin et al. (2000, p.18) clearly state that 'placing is not private placement but a form of public securities issuance comparable to firm commitment offering in the US'. Therefore, it is confusing whether their samples constitute bought-deals, firm commitments or pure non pre-emptive placings. The market indeed reacts positively to the announcement. Positive reactions are also documented by Barnes and Walker (2006) who extend the Slovin et al. (2000) study and by Balachardan et al. (2009) for UK placements accompanied by open offers and for accelerated book-builds. Regarding their long-run post abnormal performance, relevant evidence refers mainly to placings accompanied by open offers (Ho, 2005).

As the evidence on UK private placements is limited, the fourth objective focuses on the *AR* reversal, as observed by the prior literature other than involving the UK. This study follows the suggestion of Fama (1998) for investigation of an observed anomaly (that rejects market efficiency) in a different market and different time periods. It examines the validity of the reversal and tests alternative interpretations.

1.3. Contributions and research questions related to equity offerings area, theory and methods

1.3.1. Contributions to equity offerings literature

1.3.1.1. Contributions to the general literature of equity offerings

The first, apparent, contribution of this study is the use of samples for which little or no evidence exists. The study uses manually collected samples for two non pre-emptive equity offerings in the UK, i.e. placings within the SEO setting and placements of already listed shares (primary and secondary placings, respectively).

Secondary placings consist of offerings initiated by one or more existing shareholders, contrary to SEO that the transaction is initiated by the company.

Additionally, the samples involve data from relatively recent years (1998-2006). Since 1996, UK firms have had more discretion to their offering choices. Firms could conduct private placements and offer more than 5% of their share capital (which was prohibited before). Additionally, they were allowed to waive the pre-emptive rights in advance and, it was no longer a requirement to publish a placing prospectus unless the offer exceeded the 5% of the share capital. In 2000, the size restriction for the prospectus requirement increased to 10%. Hence, the study provides a thorough investigation on the implications of the primary placings in the UK, following the deregulation of 1996, and capturing the regulation changes of 2000. In general, there is only little evidence for private placements in the UK (Slovin et al., 2000; Barnes and Walker, 2006; Ho, 2005; Balachandran et al., 2009; Armitage, 2010) and no evidence for UK secondary placements.

It is worthwhile that the current study does not try to extend prior studies that use UK placings. The samples used by the above previous studies are similar to the US firm commitment offers (Slovin et al., 2000; Barnes and Walker, 2006) or they are accompanied by open or right offers (Ho, 2005; Balachandran et al., 2009). The primary placing sample used by the current study consists of pure non pre-emptive offers that either are first bought by the underwriter or accompanied by pre-emptive offer. Although pure placings are also examined by Balachandran et al. (2009) and Armitage (2010), these studies investigate the signals sent by each flotation method and investor identity, respectively. Therefore, the present study focuses in answering different research questions.

In addition, the study adds to the body of knowledge by exploring the implications of transactions with existing blocks of shares, about which similar prior UK evidence is sparse. Finally, the study contributes to the literature by comparing the findings between the two samples as well as by examining whether US models and arguments are applicable to the UK.

1.3.1.2. Contribution to the literature on the SEO discount or premium

Regarding the offered price *(Obj.1)*, prior studies attempt to provide an explanation on why a discount is necessary for SEO. Among the most acceptable explanations is that investors need to be compensated to buy a relatively overvalued stock (Eckbo and Masulis, 1992). This is in the spirit of the Myers and Majluf (1984) adverse selection problem. The various issue types convey different costs and benefits, which should be reflected by the discount. However, according to Hertzel and Smith (1993) undervalued firms can distinguish themselves by choosing private placements. Still, new investors will need to acquire the necessary information before investing, for which they need to be compensated with discount. Wruck (1989) and Barclay et al. (2007) argue for agency explanations, such as monitoring and entrenchment costs occurred by the new private investors, respectively.

Nevertheless, in the UK, investors are mainly existing shareholders rather than new (Armitage, 2010). Thus, it is unlikely that discounts are mainly driven by these factors. Although this study examines the certification and monitoring arguments using UK pure placings and secondary offerings, it mainly contributes by deviating from the above arguments. It additionally investigates the impact of illiquidity on non pre-emptive offerings.

It is generally accepted that SEO stocks are mainly illiquid with downward sloping demand curve (Scholes, 1972; Loderer et al., 1991). The high transaction costs and subsequent price impact create the need to compensate investors (see Barclay and Litzenberger, 1988; Kothare, 1997; Corwin, 2003; Altinkilic and Hansen, 2003 for US SEO; Armitage, 2007; 2002 for the UK right, pre-renounced right and open offers). However, to the best of my knowledge, the liquidity argument is disregarded with regards to private placements. Only little attention has been given, mainly to sale-restricted stock (Silber, 1991 and Maynes and Pandes, 2008 for restricted US and Canadian private placements, respectively).

Hence, liquidity seems a common driving factor in the US, Canada and UK, while the general applicability of other arguments such as manipulative short-selling and

monitoring are less apparent.[1] Thereby, the present study contributes by testing new possibilities for the discount of UK non pre-emptive offers. Furthermore, to the best of my knowledge, explanations about the discount or premium of secondary offers have not been provided by the literature, apart from the possibility of buying at premium which is likely to signal private benefits (Barclay and Holderness, 1989) or monitoring incentives (Barclay et al., 2001). Answering the first research question Q1 meets the first objective:

Q1: Are factors such as certification, monitoring, liquidity and/or private benefits able to explain the offered price of UK non pre-emptive equity offerings?

1.3.1.3. Contribution to the long-horizon abnormal performance literature

Within the second research objective *(Obj.2)*, the study contributes by identifying whether the US pattern of overperformance the years before the private placement but underperformance afterwards is documented by UK private placements. To the degree I am aware of, relevant evidence on UK private placements is limited.

Attempting to explain any relevant observed pattern, this study questions from where the implied growth in prices prior the offer comes. Is it because the firms identify a window of opportunity to sell overvalued equity (Lee, 1997; Hertzel et al., 2002; Loughran and Ritter, 1997)? Or is it because the firms manage earnings the year prior the offer (Teoh et al., 1998b; Rangan, 1998; Iqbal et al., 2009; Yoon and Miller, 2002)? Could it be both? Both of these hypotheses imply that investors are not able to recognise the overvaluation of the particular stock at the time of the offer. This implies miss-pricings and the signals received by investors are wrong.

Nonetheless, contrary to the US evidence that new investors participate and affect firm policies, investors in the UK equity offerings are mainly existing rather than new investors (Armitage, 2010). This provides additional potential interest to investigate the long-run abnormal performance paths and/or their determinants

[1] Manipulative short-selling activities of specific investors during the offer period (Kim and Shin, 2004; Sarrieddine and Wilhem, 1996; Gerard and Nanda, 1993) cannot be applicable in the UK. This is because of the different procedures in the discount setup (see section 2.2.2). Similarly, arguments referring to new investors acting as external monitor factors (Wruck and Wu, 2009; Krishnamurthy et al., 2005) are likely to have less weight in the UK, due to the identity of investors being existing shareholders (Armitage, 2010).

following UK non pre-emptive placings. In line with this, Hellier (2010) calls for further research in the context of earnings quality for the UK market.

This study contributes by reporting the pre- and post-announcement *AR* surrounding the two placing types. It additionally performs fundamental ratio analysis, reports operating performance and controls for agency costs (Jung et al., 1996). Expanding prior literature that explicitly advocates for a 'window or opportunity' hypothesis, the study takes the UK settings into consideration and argues for a different version of 'timing'. It argues that investors are over-optimistic about the future firm performance rather than knowingly sell over-valued stock (as they are mainly existing shareholders). In the context of earnings quality they study argues that false signals based on other accounting items byond earnings enchance over-optimism and temporary boost the market prices. It also controls for the probability that the reported earnings are subject to managerial discretion, as well as agency costs.

To the degree I am aware of, prior studies have not examined whether firms conducting UK non pre-emptive placings opportunistically manage earnings. Similar findings are reported only by studies examining other SEO types such as public and open offers (see Teoh et al., 1998b; Iqbal et al., 2009; Yoon and Miller, 2002 for earnings management and Jung et al., 1996 for agency).

Moreover, this study contributes by examining arguments with regards to the secondary placings which are different from the common US tests. US studies generally argue that investors in secondary offers are active, which manage to raise firm value (Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Philips, 2003). Nevertheless, it is unlikely that such theories are valid in the UK. The majority of transactions with existing shares involve buyers that are already shareholders. Additionally, the offers are initiated by the seller rather than the buyer. Thus, the US arguments on value creation because of higher monitor of external investors are unlikely. On that basis, the current study provides alternative interpretations for the patterns observed. The study investigates whether the sellers have the knowledge and bargaining power to time the offer and mislead the buyers. To the best of my knowledge, these tests with regards to the transactions of existing

blocks of shares had had the least (or no attention) by prior studies. Answering the second research question Q2 meets the second objective:

Q2: Can timing and/or earnings management (partly) explain the long-run abnormal performance for each of the two samples?

1.3.1.4. Contributions to the literature on abnormal return reversal of private placements

The fourth research objective *(Obj.4)* contributes to the literature by re-examining the arguments suggesting that private placing investors overreact at the announcement. Contrary to Hertzel et al. (2002) who interpret the reverse signs of the announcement and long-run abnormal returns *(AR)* as investor overreaction, this study investigates alternative hypotheses on why *AR are likely* to reverse. First, as prior literature refers to the US and Japanese findings, this study investigates whether this pattern is also observable in the UK. Intuition suggests this reversal is also a UK phenomenon, due to the 'trend' of the issuing firms to underperform. At the same time, the announcement market reactions of UK open offers accompanied by private placements is positive (e.g. Slovin et al., 2000; Barnes and Walker, 2006).

The current study primarily contributes by challenging the common overreaction hypothesis. It adds knowledge by providing a thorough investigation about potential explanations of the puzzle. In particular, although few of the 'stories' tested by this study have been examined by the general SEO literature, to the best of my knowledge they have not been examined with regards to private placements. Such possibilities include model misspecifications of the long-run *AR* (Fama, 1998; Mitchell and Stafford, 2000; Brav et al., 1997), other information released at the announcement (Korajczyk et al., 1991; Antweiler and Frank, 2004) and investor speculative activities. Additionally, the study investigates other 'stories' such as the pseudo-timing hypothesis (Schultz, 2003; Dahlquist and De Jong, 2008; Viswanathan and Wei, 2008) and changes in risk factor loadings not captured by the benchmark used (Eckbo et al., 2000; Boechme and Sorescu, 2002; Eckbo and Norli, 2005). Answering the third research question Q3 meets the fourth objective:

Q3: Could 'stories' beyond the common overreaction hypothesis such as pseudo-timing, liquidity and model misspecifications, other information and investor speculative activities justify this pattern?

1.3.2. Contributions to theory

1.3.2.1. Contribution to signalling theory

Without doubts, the SEO convey a great amount of asymmetric information between the firm and market (Myers and Majluf, 1984). Information asymmetries might explain the reported discount and/or cause significant impacts on market prices. Investors tend to interpret firm decisions as 'good' or 'bad', according to how they perceive a particular corporate decision. They thus react accordingly. The most classic and controversial for its time article, 'Market for Lemons' (Akerlof, 1970), characterizes the sellers as 'lemon owners' who sell a product whose quality is lower than an uninformed investor believes. Thus, adverse selection problems are associated.

The SEO literature has its intuition behind the 'market for lemons', suggesting arguments along similar lines. It is suggested that firms conducting SEO face adverse selection problems. They sell new equity when the intrinsic value of the issue is less than the benefits of the proceeds, implying relative overvaluation (Myers and Majluf, 1984; Eckbo and Masulis, 1992). Thus, the market reacts negatively. While the signals sent by the US and UK firms are associated with adverse selection problems, the market reacts differently or the adverse selection problem is less onerous for the same issue types in the UK (Slovin et al., 2000). This suggests different investor perceptions about the implications around the SEO.

With regards to private placements (not SEO in general), the signals sent to the market are positive. A widely accepted argument is the known certification hypothesis (Hertzel and Smith, 1993). This advocates that the reactions to private placements are positive as the signals received by the market assume the particular stock is undervalued (contrary to public offers). Hence, the choice to privately place new stock facilitates firms to communicate their identity as 'non-lemons'.

Nonetheless, the fact that *AR* reverse few years later might imply that the signals sent were wrong after all. As UK evidence on private placement signalling is sparse, this study contributes by examining these arguments.

1.3.2.2. Contribution to agency theory

The SEO evidence associate the signals sent with arguments derive form the agency theory (Wruck, 1989; Barclay et al., 2007; Barclay and Holderness, 1989). Agency theory deals with the conflict of interests that arises from the relationship between the owner (shareholders or principals) and control (agents or managers) parts of the corporation (Jensen and MecKling, 1976).

As far as the private placements and secondary offerings are concerned, prior studies suggest the new investors act as external monitoring factors to the incumbent management (Krishnamurthy, 2005; Wruck and Wu, 2009; Bethel et al., 1998). This will lead to potential value improvements. Opposite arguments are also suggested. The new investors will actually entrench the incumbent management rather than monitor it (Barclay et al., 2007). The new investors are also likely to target the extraction of private benefits at the expense of the minority interest (Barclay and Holderness, 1989; Duck and Zingales, 2004). This study contributes by examining whether the sale of equity is subject to agency problems. In such case, the new funds will lead to reduction of firm value, implying investment into negative NPV projects. Extraction of private benefits will also reduce firm value, regardless of the offer being primary or secondary.

1.3.2.3. Contributions to market efficiency

Corporate finance and market based accounting models have a fundamental assumption that the market is efficient. Nonetheless, testing whether the market is efficient is not easy. It is 'jointly tested conditional with some model of equilibrium, an asset-pricing model' (Fama, 1991, p.1589) which attempts to answer whether the knowledge is properly reflected in prices. The corresponding model of equilibrium is also subject to a joint-hypothesis test: that the market is efficient and that it is able to describe the cross-section variation of expected returns properly. Unavoidably, all

models are subject to market efficiency, while it is argued that none model can actually tell a perfect economic story (Fama, 1998, p.299). The 'line' between efficiency and the 'bad model' problem is ambiguous. This study contributes to the market efficiency hypothesis (Fama, 1970; 1991) in several ways.

First, the study provides a detailed review on the debate of long-horizon abnormal performance studies, as long-horizon *AR* estimation is sensitive to the methodology employed (Brav et al., 2000). Unlike prior review studies that focus on short-event windows (e.g. MacKinlay 1997; Campbell et al., 1997; Armitage, 1995; Strong, 1992), this study contributes by gathering the most recent and practical issues related to the long-horizon abnormal performance approaches and the rationale behind their research design *(Obj.3)*. It attempts to explain the several problems of each approach, as well as solutions suggested by the literature. Having synthesized the contributions of prior articles, the study also recommends ways of how to expand the extant literature. Moreover, as it is common within the corporate finance literature to examine the stock and operating performance (e.g. Hertzel et al., 2002; Loughran and Ritter, 1997), the study also explains the accounting performance approach, which involves fundamental ratio analysis (e.g. Brown and Warner, 1986; Barber and Lyon, 1996).

The second contribution on market efficiency derives from the fourth objective of the study *(Obj.4)*. A systematic reversal in *AR* around private placements strongly rejects the notion of market efficiency. It raises questions on whether there is consistency to the *AR* reversal, i.e. whether this 'anomaly' persists. Do private placement investors systematically fall into the same mistakes and wrongly react positively at the announcement, regardless of the negative post-event abnormal performance? Is the market unable to understand the real implications of private placings? Such anomaly implies that systematic excess returns can be achieved by informed investors.

This study investigates whether this pattern is robust. First, Fama (1998, p.300) advocates that 'an anomaly is real when it is observed in different sample periods'. Thus, if an anomaly is no longer observed in future periods, it is probably erased due to the 'knowledge of its existence' (Fama, 1991, p.1593). Similarly, Malkiel (2003) and Schwert (2003) note that several predictable patterns disappear after they

become publicly known by the finance literature. One explanation for this is that 'practitioners are likely to learn quickly about any true predictable pattern and exploit it to the extent that it becomes no longer profitable' (Malkiel, 2003, p.63). Alternatively, new methodologies control for several known or potential biases over a specific sample and help in explaining the reported patterns.

Following these statements, an out-of-sample analysis is conducted. The sample period helps in examining this investor (ir)rationality, as it is recent and has not been examined yet (1998-2005). Additionally, the study contributes by using a different market (UK) in case the puzzle is market specific. It applies several long-run *AR* methods and controls for known problems and biases, avoiding the model misspecification problem (to the extent that it is possible).

It additionally examines several other competing stories that could potentially explain this reported anomaly (e.g. other information, pseudo-timing, changes in cost-of-equity that the benchmark model cannot control for). Finally, it also investigates whether specific investors that have private information regarding the upcoming private placement speculate on the market prices. This later test falls within the strong-form of efficiency. In other words, answering the third research question Q3 contributes not only in understanding this particular phenomenon which puzzles the equity offering literature, but also contributes to market efficiency evidence.

1.3.3. Contributions to methodologies

1.3.3.1. Long-run abnormal performance methods

To estimate long-horizon *AR*, two competing approaches dominate. The known buy-and-hold *AR* method and the calendar-time *AR* method. The difficulty in choosing between the two is related to the fact that each approach has its own pros and cons, while it is subject to several problems (see Chapter 3 for details). Thus, they could be seen as complementary rather than competing models. The buy-and-hold approach is less susceptible to the ability of the model to explain expected returns, however it is subject to more severe econometric problems (Loughran and Ritter, 2000; Lyon et

al., 1999). Contrary, calendar-time *AR* are less sensitive to econometric problems, but more sensitive to the model used (Fama, 1998; Mitchell and Stafford, 2000).

Thus, an opportunity for further research and the use of new tools in assessing long-horizon *AR* is provided (Lyon et al., 1999). New methodologies might control for several known or potential biases over a specific sample which help in providing 'normal' inferences, consistent with market efficiency (Schwert, 2003).

Building upon these propositions, this study makes a step beyond the conventional event-study methods. It contributes by applying a different asset-pricing model which has its intuition on a parallel set of literature. In particular, several articles published into well established finance journals advocate that liquidity-adjusted pricing models have high predictive ability to forecast stock returns via liquidity strategies (e.g. Amihud, 2002; Pastor and Stambaugh, 2003; Acharya and Pedersen, 2005; Gallmeyer et al., 2004; Chordia et al., 2008). This literature suggests liquidity risk affects stock returns, in a time-series manner.

Motivated by this literature and arguments supporting that the reported *AR* are actually manifestation of the methodology (Mitchell and Stafford, 2000; Brav and Gompers, 1997) rather than market inefficiency, the current study applies a liquidity-adjusted asset pricing model. A two-factor model is employed (Liu, 2006) which captures the market premium and a liquidity premium.

This study contributes to the ongoing long-run *AR* debate by applying not only the traditional methods, but also an alternative model advocated that it is able to capture better the cross-section variation of expected returns. This application is also consistent with the implications of Eckbo et al. (2000) and Eckbo and Norli (2005) that the common asset pricing models ignore illiquidity, as well as with the view that an observed anomaly might be explained by different asset pricing model (Fama, 1991, p.1589). A fourth research question Q4 responds to whether such deviation from the event-study methodologies is beneficial or not, and facilitates in meeting the third research objective.

Q4: Is there any benefit to deviate from the existing literature and assess long-run abnormal performance by applying a liquidity-adjusted asset-pricing model?

1.3.3.2. Liquidity as a factor affecting expected returns

In a vein similar to the long-horizon *AR* methodology, it is common to apply a 'traditional asset-pricing model' to examine the cost of equity capital and changes in the risk factor loadings (e.g. Boechme and Sorescu, 2002; Grullon et al., 2001). An acceptable pricing model estimates the implicit discount rate used to value the firm equity (higher expected return implies a riskier firm). Other approaches such as abnormal earnings growth valuation models (e.g. Code and Moharnam, 2003), residual income models (e.g. Claus and Thomas, 2001; Gebhardt et al., 2001) and/or others are also applicable. The estimated cost of equity is subject to the risk factors of the pricing model, such as the stock beta, the market premium, size premium, growth, profitability, and/or other. Therefore, the traditional models indeed fail to account for any changes in cost of equity attributable to liquidity risks.

Considering the growing literature which refers to the ability of the liquidity premium to predict and explain future returns, as well as the evidence that illiquidity and high transaction costs raise the cost of issuing capital (Corwin, 2003; Altinkilic and Hansen, 2003; Gao and Ritter, 2009), investigation, or at least control for, the (il)liquidity component of the cost of equity of SEO firms is needed. On that basis, this study contributes to the extant literature by testing the impact of corresponding component on UK placing firms. It tests how this might affect the reported *AR*.

The study expands prior literature by testing whether the factor loadings of the Liu (2006) liquidity-adjusted asset pricing model change after the event. Hence, the analysis captures changes in the risk factor loadings that might affect the reported post-underperformance. Boechme and Sorescu (2002) adopt this approach by applying the Fama and French three factor model following dividend initiations and resumptions and Grullon et al. (2001) following increases in quarterly dividends.

To the best of my knowledge, this is the first study that applies a liquidity-adjusted pricing model as a cost of equity tool. Whether such deviation is beneficial, it is tested in comparisons with the Fama and French (1993) and Carhart (1997) models that capture the size, book-to-market and momentum factor changes. A fifth research question Q5 addresses this issue.

Q5: Is there any benefit to deviate from the existing literature and capture the (il)liquidity component of cost of equity?

1.4. Structure of the study

The study consists of seven chapters in total. Following this introductory chapter, two chapters discuss prior literature and existing knowledge in terms of SEO settings and evidence (Chapter 2), and in terms of long-horizon *AR* methodologies (Chapter 3). These two 'review' chapters are followed by three 'empirical' ones which are seen as standing alone smaller studies that mainly pursue one (or more) of the research objectives of the study. Each one develops testable hypotheses based on the most relevant literature, applies a research design accordingly and, reports its own findings. On that basis, the remaining of the study is structured as follows.

Chapter two briefly describes the SEO area. It portrays the institutional settings, procedures and implications in the UK and US. It reviews the existing evidence including arguments of prior studies that US models are not applicable into the UK. The chapter helps in understanding the UK market, emphases the gaps in the literature and indicates the broader motivation of the study.

Chapter three illustrates the techniques of assessing long-run abnormal firm performance following a corporate event, i.e. the first part of the third research objective *(Obj.3)*. It reviews the ongoing debate on stock and operating long-run abnormal performance. It provides a brief guidance on how to choose among the alternative methodologies and, suggestions of how to expand the extant literature.

Chapter four examines the first research objective of the study *(Obj.1)*. It focuses on the discount or premium of non pre-emptive equity offerings in the UK and attempts to define their determinants. It examines four testable hypotheses and provides answer to the first research question (Q1). This chapter also provides a detailed description of the sample collection process.

Chapter five explores the second research objective *(Obj.2)*. It assesses the long-horizon abnormal performance (stock and operating) for the six years surrounding

the offerings. To explain the reported patterns, the chapter tests two non-mutually exclusive hypotheses, namely the timing hypothesis (or window of opportunity) and the earnings management. It provides answer to the second research question (Q2).

Chapter six investigates mainly the fourth research objective *(Obj.4)*. It focuses on the announcement and long-run abnormal returns of private placements in the UK. It attempts to contribute to the extant literature by focusing on the puzzling reversal of *AR*. While it challenges the common overreaction hypothesis, it tests four additional alternative hypotheses. Moreover, it expands prior literature by employing new long-run *AR* and expected cost of equity methods, i.e. the second part of the third research objective *(Obj.3)*. It provides answers to the remaining research questions (Q3 - Q5).

Finally, *chapter seven* concludes. It summarises the testable hypotheses and main finings. In other words, it describes 'what we learn from this study'. It additionally identifies limitations of the study and provides suggestions for further research.

Chapter 2 : Understanding the UK market, Background on Equity Offerings and Motivations

2.1. Introduction

This chapter describes the SEO area and attempts to communicate the UK settings, existing evidence and gaps in the literature. It additionally highlights the main differences between the UK and US SEO procedures. It does not aim to develop testable hypotheses. Instead, it emphasises in understanding the market, relevant theories and findings.

It has been a long tradition in the UK that existing shareholders are automatically offered any new shares in proportionate to their holdings, before the shares are offered to any outside investor. This 'clawback' procedure is mandatory. Only since the mid-1980s British firms were allowed to waive the pre-emptive rights, under certain circumstances. To protect the parties involved, the London Stock Exchange (LSE) issued official guidelines about non pre-emptive offers in 1987. Since then, UK non pre-emptive placings have begun to rise.

In particular, three SEO types are common in the UK market i.e. the rights issues, open offers and placings. The most common method is now an open offer with a placing (Barnes and Walker, 2006). Contrary, in the US, there is no requirement for pre-emptive rights and the main issuing methods are firm commitment offers and private placements. Firm commitment offers are public offers first bought by an underwriter who resells the shares to the ultimate investors.

The two markets have further essential differences in terms of the placing types and procedures, direct and indirect costs of raising capital, disclosure requirements, investor identity and incentives. These differences lead to different SEO implications which make models and arguments advocated by the US studies not applicable into the UK (Slovin et al., 2000; Korteweg and Reneboog, 2002, Armitage, 2002).

Additionally, while the majority of the UK evidence refers to right and open offers, US evidence also examines private placements and transactions with blocks of already listed shares for which limited or no evidence is reported for the UK. Thereby, the non-applicability of the US models and the lack of (adequate) UK evidence on private placements and existing blocks of shares, raises the need to investigate deeper these two types of offers in the UK.

The structure of the remaining chapter is as follows. Section 2.2 describes the institutional settings in the UK and US and, identifies the most significant differences between them. It illustrates the incentives and implications in the two countries. Section 2.3 reviews the main existing evidence and indicates gaps in the literature that the current study attempts to fill. The last section 2.4 concludes.

2.2. Institutional settings and equity offerings procedures

2.2.1. The issue types in the UK

2.2.1.1. Pre-emptive rights

It is compulsory for the firms to offer any new shares issued firstly to existing shareholders in proportion to their holdings on similar or better terms. Once existing shareholders decide whether they will buy their entitlements (or not), the shares not taken up are offered to outside potential investors. Conversion of securities into ordinary shares must also be offered to existing shareholders in proportion of their holdings. The existing shareholders maintain this right of 'first refusal' in various European countries including the UK, Norway, Netherlands, Greece as well as in New Zealand and Japan. The purpose of this so called 'pre-emptive right' is to protect the stakes of existing shareholders from dilution. They are automatic and mandatory imposed in any new share issue. Pre-emptive offers are also commonly known as 'placements with clawback' or 'on pro rata basis'.

Pre-emptive rights have been contained in the European Community Second Company Law Directive since 1977. Although pre-emptive rights were mandatory for UK public companies long ago, the provisions on shareholders' pre-emption rights were combined by UK Companies Act 1980, to implement Directive

77/91/EEC. According to the UK Companies Act 1980, a placement without clawback was not allowed by the LSE at all.

Nevertheless, since 1975, non pre-emptive offers have begun to be acceptable by the stock exchange rules (Armitage, 1998). An Extraordinary General Meeting (EGM) resolution had to state that existing shareholders voluntarily waive their pre-emptive rights though. This was the beginning of placings. Formal relevant regulation was first provided by the Companies Act 1985 s.89 (see Barnes and Walker, 2006) which permitted disapplication of pre-emptive rights under certain circumstances. Non pre-emptive placements were applicable only for specific number of the firm shares. They were not allowed to exceed the 5% of the shares outstanding and an EGM resolution was necessary. Publication of the placing prospectus was also compulsory.

Since 1986, the disapplication of the pre-emptive rights could also be approved 15 months in advance, without EGM resolution for every issue. However, the in advance disapplication was still subject to conditions of cumulative offered size and value (to be up to 5% of the shares outstanding). This made the placing procedure faster. General pre-emption guidelines were issued by the LSE in 1987, to protect the several parties involved. In sequence, in 1996, the LSE listing rules removed the relative offer size restriction of 5%. Firms could place as many non pre-emptive shares as they wished, as long as shareholders approved the offer. Moreover, a firm could waive the pre-emptive rights 12 months in advance, while the publication of the placing prospectus was no longer compulsory for placings with size up to 5% of the firm share capital. In 2000, the listing rules 'relaxed' the prospectus requirement further to 10% of the capital. This allows British firms to have more discretion to their issue choices (see Listing Rules, 2007). Further on pre-emption can be found at Myners (2005).

2.2.1.2. Equity offering types and issue process

The most common method to issue capital in the UK and the rest of Europe had been the right issues (RI) method until the year 1994, when open offers (OO) started to be very famous (Armitage, 1998). Both methods are placings with clawback, contrary to

the mentioned placings that disapplication of the corresponding pre-emptive rights is required. These are the three main forms of issuing shares in the UK.

➢ *Right issues (RI)*

RI involve new shares issued and offered first to existing shareholders in proportion of their holdings. The rights have the form of provisional allotment letters (PALs) which are sent to the existing shareholders at the time of the RI announcement. A prospectus approved by the LSE accompanies the offer. In general, when a UK equity offer takes place, the LSE regulation requires the publication of the placing prospectus, which is approved by the Financial Services Authority (FSA). FSA serves as the competent authority of the issuers' home State (s.85(7)). An application for admission of the securities to trading is also required.

The offer of rights starts immediately after the announcement or after an EGM meeting (if necessary) and lasts for at least three weeks. At the end of the offer period, the new shares are issued. During the offer period, the right (PAL) is tradable to the market. The PAL is a European call option which starts trading after the announcement (or EGM) and matures at the issue day. Its exercise price is the offer price and underlying asset the share. The offer price of the new shares is agreed at the evening prior the announcement day and becomes public at the announcement. It is at discount to the market price compared to the day prior the announcement. The offer price remains fixed during the whole offer period and cannot be altered. Thus, the risk of the offer to be unsuccessful is high, i.e. if the market price falls below the exercise price, the option will be left unexercised at the maturity, as the option holders will have no positive payoff. On that basis, the level of the discount could vary according to the riskiness of the offer, stock liquidity, demand elasticity or other reason (details are provided in section 2.3.3).

RI are usually underwritten. The firm hires an investment bank or a broker to organize the issue, known as the underwriter or the underwriting syndicate (a group of underwriters or investment banks). The underwriter commits to subscribe for the shares not sold at the end of the offer period and place them with other investors.

Actually, it has been common practice in UK that SEO are underwritten. The main responsibilities of the lead-underwriter are to advise the company, to coordinate the prospectus writing procedure, to sponsor the issue in terms of marketing and finding investors. The broker or lead underwriter guarantees the gross proceeds of the issue, by committing that the syndicate will place with institutions or other investors any unsold shares at the end of the offer (Armitage, 2000). This is the so-called standby underwriting which appears to be the common underwriting method in the UK.

Shareholders wishing not to take up their entitlements can either sell the rights during the offer period or renounce the rights by the ex-rights day (the day after the announcement or EGM). The pre-renounced entitlements are placed with the underwriter or an institutional investor (Armitage, 2007). Obviously, the decision to pre-renounce or trade the right to the market is based upon the expectation on how much investors can earn by selling the right in the secondary market, and by pre-renouncing their entitlement before the trading starts. Armitage (2007) documents evidence about pre-renounced rights, arguing that selling large blocks of shares along with rights at the market entails large costs (rights and the shares are very illiquid). Thus, pre-renouncing might provide higher revenues. Unsold shares (rights not traded during the offer period or not exercised at the maturity) and rights not taken-up (pre-renounced) are sold by the underwriter to the market with the proceeds distributed to the existing shareholders.

In case that an EGM is necessary to approve the new issue, further two or three weeks are required after the announcement before the beginning of the offer period. This postpones the start of the PALs' trading, which cannot commence before the resolutions of the EGM are passed. After the EGM approves the offer, the PAL trading begins and lasts again for approximately three weeks until the share issue. Thus, in this case, the share issue delays. It needs approximately five or six weeks from the announcement day.

- *Open offers*

Regarding the open offers (OO), they are similar to RI in the sense that existing shareholders are invited to subscribe for the new shares on a pro-rata basis. However,

three significant differences in the procedures between the OO and RI exist. First, the shares in OO are placed privately with institutions before the announcement (contrary to a stand-by underwriting of RI). They are then offered to existing shareholders on clawback.

Second, the rights (PALs) are not tradable to the market and cannot be sold to other investors. Thus, there is no compensation for the dilution experienced by existing shareholders that do not take up their entitlements. PALs not taken up by the end of the offer period are bought by the investors (institutions) already arranged in the first place (Armitage, 2002). Although PALs are not tradable and cannot be sold during the offer period, the shares are not issued until the close of the offer period, approximately three weeks after the announcement day, similar to the RI.

Finally, in case an EGM is necessary to approve the OO, it is held immediately after the end of offer period, but before the new shares are issued; authorisation is not needed until the shares are issued and since the PALs are not tradable, the EGM resolutions do not delay the offer period for two-three weeks as in RI (that the rights need to be issued). Once the EGM resolutions approve the OO, the new shares are issued the following day. Similar to the RI, OO are usually offered at discount to the prevailing market price prior the announcement.

- *Placings*

The last SEO method is known as placing. Unlike the right and open offers, new shares are issued and placed with specific investors without the existing shareholders to maintain pre-emptive rights to subscribe for the new shares, on a pro-rata basis. The right of 'first refusal' does not exist. Contrary, the shares are sold to investors after direct negotiations with the firm.

Similar to the right and open offers, the offer price is agreed ex-ante the announcement and becomes publicly known at the announcement. When the shares are issued (i.e. about three weeks to one month afterwards), they are allocated to the private investors to the agreed price. An application for admission of the securities to trading is required. Again, it is common for the placing to be underwritten.

Additionally, the firms are required to have EGM resolutions for the pre-emptive rights disapplication and publish the placing prospectus approved by the LSE (as explained in section 2.2.1.1). Recall that after the change in the listing regulation in 1996, firms can privately place shares with ex-ante disapplication of the pre-emptive rights and without publishing the prospectus for placings up to 5% of their capital. According to the 2000 Act, firms participating into placements are not obliged to publish the prospectus or an agreement contract, unless the offer exceeds the 10% of their issued share capital. This assumes the pre-emptive rights had been waived in advance or they are not subject to the issuance (e.g. the placing does not accompany a RI or OO). However, it is common practice for firms to publish a prospectus for placements over the 5% of the shares outstanding (disclosure requirements and other cases that exempt from the prospectus requirement are described in section 2.2.2.3).

Nowadays, very few firms issue RI (approximately 20 per year, usually by large companies; Armitage, 2007). Contrary, the common perception is that OO accompanied by a placing is the most frequent share offer method (Barnes and Walker, 2006), which is subject to the requirement of a prospectus publication.

2.2.1.3. Further issues and definitions

In addition to the above descriptions of the UK issue types, Barnes and Walker (2006, p.48-51) provide a detailed description of the UK issuance mechanisms and the definitions as provided by the 1998 listing rules of the LSE. In fact, they describe six methods: right issue, public issue, offer for subscription, placing with institutions, open offer and placing with open offer. While right and open offers are as described above, public issues and offers for subscription are defined as invitations to the public by a third party or by the issuer, respectively, to subscribe for new shares. As Barnes and Walker state, the public issue usually has no restrictions to the investor characteristics while the offer for subscription mainly targets small number of institutional investors.

Nonetheless, due to the automatic pre-emptive entitlement of the existing shareholders in the UK, both of these mechanisms require disapplication of the pre-emptive rights. Thus, these two categories fall under the umbrella of placings as

described above (without specification on the identity of the new investors). Likewise, according to the UK exchange listing rules, the 'placing with institutions' could also be defined similar to a placing. The new shares are offered to one or more investors, private or institutional, without pre-emptive rights.

Additionally, Barnes and Walker (2006) interpret underwriting as the procedure of a sponsor purchasing the shares and placing them with institutions, in exchange of a fee. This is the so called bought deal or firm commitment offer. However, according to the listing rules, there is no requirement for the placing to be bought by the underwriter in advance. Thus, it could fall again under the general definition of placings.

Classifications are also made by the Financial Services and Markets Act (FSAMA) in 2000. The forms of new issues are known as follows: (i) public offer for subscription, which includes a general invitation to the public; (ii) placing, which involves a small number of investors approached privately; (iii) an intermediaries offer where the new shares are offered to a number of brokers and professional investors, (iv) RI, and (v) OO.

Overall, when the new issue is not a right or open offer, the remaining offer types are subject to disapplication of the existing shareholders' pre-emptive rights. The three mechanisms are usually underwritten, whilst the identity and the number of investors are subject to changes. The current study uses the general definition for placements as being equal to a non pre-emptive offering of new shares issued.

2.2.2. Differences from the US

2.2.2.1. Placing types in the US

While pre-emptive offers exist inter alia in Canada, several European countries, Japan, South Africa, New Zealand, the most common method of issuing shares in the US is the so called public offers or firm commitment offers. In contrast to the standby underwriting in the UK, a US public offer is first bought by an underwriter or merchant bank, who place it with investors (for this reason they are also called

bought deals, BD). The underwriter resells the stock to investors at a higher price without first offer it to existing shareholders on a pro-rata basis. Additionally, although nowadays very few firms in the UK still issue rights, in the US they have almost disappeared long ago, around mid-1980s (Eckbo and Masulis, 1992).

More specifically, a US issuing firm appoints an underwriter or the underwriting syndicate to manage the issue. While listed firms usually have long relationships with commercial banks and/or at least one underwriter, sometimes competing underwriters make presentations to the issuer as part of a process of choosing the correct lead underwriter (Eckbo et al., 2007). The lead underwriter is responsible to register the new shares with Securities and Exchange Commission (SEC). Then, the offer is announced and the subscription (offer) period begins. It lasts for about one month until the issue day.

Although the above underwriting actions are similar to the UK, in the US the underwriter 'markets' the offer during the offer period. A road-show takes place. The underwriter presents a preliminary prospectus or red herring to potential investors and clients. The underwriter observes the market reactions and investor demand, whilst all negotiations with potential buyers as well as offers to new and existing investors are not binding. The offer price and size can be adjusted according to the demand and market reactions. It can even be withdrawn. In other worlds, not only the new shares are *not offered first* to existing shareholders in proprietary to their holdings as in the UK, but also the offered price is *not definite* at the announcement. Thus, the underwriting risk is lower due to the flexibility in setting the price.

At the end of the offer period and after the SEC approves the share issue, the firm meets with the underwriter and set the offer price, using the information gathered during the subscription period. It thus takes the market reactions and investor response into account (contrary to the UK that all characteristics are set prior to the announcement). After the price is set, the shares are issued usually at the following day and investors can buy from the underwriter, without dealer fees, brokerage commissions or taxes (Hansen, 1988). The underwriter gains the difference in the prices that bought the share from the firm and sold it to the investors. This

contradicts the UK procedure, that investors buy directly from the company and underwriters receive a fee from the issuer.

Moreover, private placements (PP) also exist in the US. The new issues are placed with specific investors (not placed with several unknown investors as in firm commitment offers) and, without first being bought by a syndicate. It is worthwhile to emphasize that UK (private) placings could be bought deals (as Slovin et al., 2000 argue). However, there is no regulation to impose this and they are usually subject to standby underwriting. The main characteristic of UK private placing is the disapplication of the pre-emptive rights while the offer is placed with specific investors (mainly institutions; Armitage, 2010).

2.2.2.2. Underwriting fees

To provide the above services, underwriters impose fees such as the underwriter fee and fee for each sub-underwriter. Precisely, in a standby underwritten issue, the subscription period begins when the prospectus is declared. The syndicate secures the issue for which a fixed standby fee is charged (the charge includes the services for advising the firm, marketing and registering the issue, commitments for unsold stock). The fee is distributed to all parties involved, i.e. to each sub-underwriter. If shares are left unsold at the end of the offer period, the underwriter buys the unsold shares and resells them to institutions or other investors. In such case, the firm is additionally charged with a take-up fee for every unsold share. In case that an EGM resolution is required, a RI delays for two-three weeks. This entails additional underwriter fees per week. Finally, the risk that the offer will be cancelled or withdrawn also entails (direct and indirect) costs.

The amount charged also covers additional costs such as registration and listing fees, fees for solicitors, accountants and printing costs (see Armitage, 2000, p.61-62 for breakdown of costs. See also Eckbo and Masulis, 2000; Smith, 1977; Hansen, 1988; Singh, 1997 for US RI). When the offer is first bought by the underwriter (in a BD) the fee covers the standby fee plus a take-up fee for each share sold at loss (Slovin et al., 2000, p.162). The fee is expressed as a percentage of the gross proceeds of the issue.

Hence, issuing entails large direct costs. Yet, a substantial difference between the UK and US fees exists. In the US, the costs of issuing are measured as the underwriter spread i.e. the spread between the price the firm sells to the underwriter and the price investors buy from the underwriter (which is usually at discount to the prevailing market price). However, UK firms pay in cash the underwriting fee and sell to investors at a distinguishable price (again, usually at discount; Armitage, 2000; 2002). Thus, in the UK there are two distinguishable costs (the underwriter fee and the discount) but only one cost in the US (the spread which also covers the discount). Thereby, the UK provides a setting to examine the discount separately from the underwriting costs.[2]

2.2.2.3. Disclosure requirements

Differences in the disclosure requirements of SEO in the two countries are also apparent. They result to different levels of asymmetric information in relation to (private) placings in the two countries. SEC reporting companies (in the US) are required to file exhibits on private placings and to report the original placement agreement. The contract provides detailed information on the offering date, names of purchasers, number of shares purchased, offer price (see Wruck and Wu, 2009).

However, such contracts are not available for UK private placements. Contrary, the overall offering requirements provide a relative opacity in the UK. While firms conducting placings are not required to publish a prospectus if the offer does not exceed the 10% of issued capital (see section 2.2.1.2), an announcement to the market should be made. The firm needs to disclose its intention to place new shares via a news report.

[2] It is argued that economies of scales are associated with the issue value, as the underwriter fee/spread is decreasing over the value of the issue (see Armitage, 2000 and Lee et al., 1996 for UK and US evidence, respectively). Overall, the level of underwriter fee or spread and further flotation costs could vary across firms based on the value and type of issue (Eckbo and Masulis, 1992; Singh, 1997; Lee et al, 1996; Armitage, 2000), firm size and return volatility (Altinkilic and Hansen, 2000), stock liquidity (Altinkilic, 2006; Butler et al., 2005), issuer accrual quality (Lee and Masulis, 2006), underwriter competition (Chen and Ritter, 2000; Hansen, 2001; Mullineaux and Roten, 2005). Evidence also relates the underwriter spread with the level of underpricing and the timing of the offer (Kim et al., 2005). Eckbo et al. (2007, Table 7) provides detailed relevant literature and summarizes pertinent studies.

According to the Directive 2003/71/EC (under FSAMA 2000, s86(7)), further exemptions from the prospectus requirement are entitled. This is when the offer: (i) is made to qualified investors,[3] (ii) is offered to fewer than 100 persons (apart from qualified investors), (iii) has small value of placements less than €2.5 millions (within 12 months), (iv) has minimum payable consideration by each investor of €50000, (v) involves substitute or conversion shares, (vi) is in connection with a takeover or merger, (vii) constitutes bonus or script dividends (viii) the shares are admitted to trading to another market.

Although the cases (i) – (iii) allow for exemption of the prospectus requirement, an application for admission of the securities to trading on a regulated market requires a prospectus, unless the application is exempted by the provisions of (iv) – (viii). As a conclusion, more discretion in the equity offerings is provided to UK companies in comparison with those in the US. Pure placing is the only SEO type that might fall within the above exempted categories for the UK market. This might justify the limited relevant evidence.

2.2.3. Transactions with blocks of already listed shares

Beyond the offer of new shares, it is also common to offer already listed shares (or blocks of existing shares) to investors. The shares could be offered generally to the public or to specific (existing or new) investors at fixed price. These transactions are initiated by the owners, the existing shareholders who wish to sell their stake or portions of it. It is likely that the shareholder contact an underwriter to help for the sale procedure. While selling via an intermediary increases the direct cost of the offer, it reduces the risk of an unsuccessful transaction. These offers are defined as secondary offers.

[3] Qualified investors are: legal entities authorized or regulate to operate in the financial markets with a purpose to invest in securities, governments, central banks or other similar international organizations, not small and medium-sized entities, or small and medium-sized entities if they are on the register of qualified investors maintained by the FSA under s87R. A small-medium sized enterprise is defined as the one which meets at least two of the following criteria: average number of employees less than 250, balance sheet total not more than €43 million and net turnover no more than €50 million (Directive 2003/71/EC).

Few secondary offers are subject to accelerated book-build. The investors negotiate their bid with the underwriter and no pre-emptive rights exist. No prospectus is submitted to be approved by the UK listing authority and the commitments of placees are based on the information contained in the offer announcement (see Balachandran et al., 2009, p. 2). Similar to the private placements, the identity of investors is subject to changes.

The US literature provides evidence, with reference to transactions of blocks of listed shares, arguing that this offer type involves very different incentives from the new share issues. US evidence document premium with secondary offers (Barclay and Holderness, 1989; Barclay et al., 2007) and argues that the new investors significantly improve firm value after the sale (Bethel et al., 1998; Barclay and Holderness, 1991). Nevertheless, evidence on UK secondary offers do not exist at all (to the degree I am aware of).

2.3. Review of the main existing evidence

The vast majority of articles investigating SEO focus on themes such as the choice of flotation methods between the SEO types, the demise of right issues and their replacement by open offers (UK) or bought deals (US), underwriting and other flotation costs, the discounted offer price, market reactions and long-run abnormal performance around the announcement. The implications on corporate capital structure, corporate governance, earnings management and incentives about SEO choices and performance are also investigated.

For the UK, the area of interest is mainly the right and open offers, whilst articles examining the US SEO additionally investigate the implications around non pre-emptive equity offerings such as pure private placements and secondary offerings. This section briefly reviews the main existing evidence.

2.3.1. Choice of issue method

Pioneers of the equity offering area, Myers and Majluf (1984) argue that a firm will issue new equity to fund potential growth opportunities (projects with positive NPV).

According to Myers and Majluf (1984), if the firm has no financial slack (and cannot cover the investment with it), it will fund the project with debt. Debt has lower costs in comparison with equity (e.g. it provides tax deductibility, monitor effects, no dilution and value mitigation) and it is preferable. However, if the firm is unable to raise debt (e.g. it is already to leveraged), it will issue equity *only* if the net proceeds collected by selling new shares are more than the benefits from the project. That is, the value allocated to new investors with the new shares is less than the value of the project. Thus, the equity issue conveys managements' belief that issuing to finance an investment opportunity will mitigate overvaluation to new shareholders. If the value transferred to new investors is higher than the project benefits, the firm will choose to forego the investment opportunity. On that basis, the market reactions at the announcement of equity issue are negative.

The evidence complies with the Myers and Majluf (1984) adverse selection problem, as negative reactions are reported for SEO issue (see section 2.3.4). Attempting to explain the choices among the equity issue types, Eckbo and Masulis (1992) identify a pecking order for US firms which is based on the cost of each equity offer method. They argue that if the expected take-up by existing shareholders is high, no wealth transfer is expected. On that basis, the firm will choose the cheapest option, i.e. non-underwritten RI (Eckbo and Masulis, 1992; Li and Masulis, 2006). If the take-up percentage falls, the firm will go for an underwritten RI (the underwriter will certify the firm value). Lower taken-up percentages will lead the firm to choose a firm-commitment offer. Although the market reactions are negative, the worse reaction is documented when bought deals are announced. The least negative reactions are reported with non-underwritten offers. This suggests less overvaluation.

Norwegian SEO follow similar pecking order in terms of adverse selection problems (Boehren et al., 1997). Mardsen (2000) also reports more favourable reactions for non-underwritten offers in New Zealand. Contrary, in Sweden reactions are not statistically significant regardless of the offer being underwritten or not (Cronqvist and Nilson, 2005) and, as a result, the preference on the SEO choice is less clear. In France, SEO document greater adverse selection effects for RI than public offers (Gajewski and Ginglinger, 2002). This suggests stronger underwriter certification in

public offers and contradicts the pecking order model. In Australia, underwritten issues are also associated with more favourable market reactions than non-underwritten (Balachandran et al., 2008). Thus, the Eckbo and Masulis order is not internationally applicable.

This pecking order does not apply in the UK either (Korteweg or Renneboog, 2002). It appears that when the issue is not underwritten, it is when the corporate is in financial distress and not when the expected take-up level is high (Armitage, 2002). Thus, the underwriter is less willing to secure the issue due to the high risk of unsold stock which is a bad signal to the UK market (Armitage, 2002; 2007; Korteweg and Renneboog, 2002; Slovin et al., 2000).

While these adverse selection costs refer to RI and public offers (or OO), Hertzel and Smith (1993) expand the Myers and Majluf (1984) model to include private placing as an equity option, using US data. They report that the underinvestment problem of undervalued firms is mitigated by choosing PP over public offer or not issue. Rather than forego the investment opportunities when the take-up is low, firms issue to few private investors. The rationale is that private investors certify the stock value by investigating privately the firm prior the placing. In this way, existing shareholders costly convey their private information to the market but retain larger fractions of the firm without equity dilution (or with only small dilution). As a result, PP signals higher firm quality or undervaluation causing positive market reactions.

At the same time, it is argued that PP firms are of higher asymmetric information (Wu, 2004; Chemmanur and Fulghieri, 1999; and Folta and Janney, 2003). Likewise, Cronqvist and Nilson (2005) use Swedish SEO and argue that firms with higher asymmetric information will choose PP over RI. Higher information asymmetry for placings over RI is also documented in the UK (Barnes and Walker, 2006).

Overall, the issue choices are mainly based on the level of asymmetric information of the firm, the costs of raising capital under each method, whether the firm is under- or overvalued and the corresponding signals sent to the market. All studies control for institutional settings, issuer and issue characteristics (e.g. distress, value, ownership control and information asymmetry levels). Additionally, the financial situation of

the company and its need to raise funds could explain the SEO choice. A quick fund rising would be ideal for a firm with liquidity problems. It is most likely that the firm will choose OO over RI, due to the less time required. It could also go via pure placing as the time needed is less (assuming relatively small offer up to 10% of the issued capital and in advance disapplication of the pre-emptive rights). Hence, the choice on the issue type is subject to several factors, rather than a simple, straightforward decision.

2.3.2. Demise of rights

The pecking order of Eckbo and Masulis (1992) on the choice of the flotation methods according to the cheapest option, suggests that non-underwritten RI should be the first choice of a firm and, underwritten RI to be the second. However, RI are generally not preferred in the US (Hansen, 1988; Eckbo and Masulis, 1992). Over the periods 1963-1981, RI were less than 5% of the US issues (Eckbo and Masulis, 1992, p.294). Even in the UK that pre-emptive rights are still automatically imposed, RI are now very few (Armitage, 2007) and have been replaced by OO. Thus, the Eckbo and Masulis order cannot explain the disappearance (or reduction) of RI. This 'right offer paradox' is considered vague by the academic world and attracts a great deal of interest.

Evidence suggests that the demise of rights is attributed to high asymmetric information, as the flotation method is a signalling mechanism. Non-underwritten RI are chosen by firms with lower quality not willing to pay the underwriting cost (Heinkel and Schwartz, 1986 for US; Armitage, 2002; Korteweg and Renneboog, 2002 for UK; Balachandran et al., 2008 for Australia). Firms in financial distress are more likely to go for non-underwritten issue, due to the high underwritten risks/costs. On that basis, very few US industrial firms still issue non-underwritten rights. They are firms in financial distress and for them the cost of adverse selection of underwriter certification lack is small (Ursel, 2006). Thus, although underwritten offers entail higher direct costs, the extra expenses could actually be seen as opportunity cost to ensure the success of the issue. This interpretation is consistent

with the more favourable market reactions for underwritten offers (Armitage, 2002; Balachandran et al., 2008).

The replacement of RI from OO in the UK is probably attributed to similar signalling mechanisms. The market reacts negatively to RI announcement but positive to OO (Slovin et al., 2000; Armitage, 2002; Korteweg and Renneboog, 2002). Firms with higher growth also choose OO (Korteweg and Renneboog, 2002). Additionally, the abnormal performance of RI firms becomes significantly negative few years later (Ngatuni et al., 2007). However, results are less clear for OO. Ngatuni et al. (2007) document positive performance for OO while Iqbal et al. (2009) negative. Regardless, better performing firms choose OO rather than RI (Ngatuni et al., 2007). This might be in line with the view that RI signal lower firm quality and thus, it is less preferable.[4]

Additionally, the avoidance of RI is likely to be associated with higher indirect costs beyond the signalling effects of the firm being in bad financial situation (Smith, 1997; Hansen, 1988; Armitage, 2007). Hensen (1988) argue that negative reactions to non-underwritten RI are due to high transaction costs incurred when attempting to find investors for the new shares. Contrary, in a firm commitment offer the underwriter is able to find new investors without such large deviations from the market price (in smaller discount).

Along similar lines, studies such as Loderer et al. (1991) and Corwin (2003) attribute the negative market reactions to the SEO being illiquid and with downward sloping demand curve. While the fact that SEO stocks are generally illiquid cannot explain the replacement of rights from other SEO types, Kothare (1997) documents higher stock liquidity following BD in comparison to RI. This implies that although both are illiquid, BD stocks become less illiquid (smaller bid-ask spread) after the offer. This could explain the preference to BD. Consistently, UK RI might appear less costly in comparison with OO and placings (becausd of the largest discount offered; Armitage, 2002). However, they are in fact of lower cost due to uncertainty about the issuer value and the stock inelastic demand (Armitage, 2007). Costs of selling the

[4] Burton and Power (2003) aim to identify systematic characteristics of UK RI and OO by examining the firm size, growth, liquidity and performance. Nonetheless the predictability of issue method is limited.

rights and shares to the market are larger than initially seem, while placings are cheaper and more effective.

Finally, RI may cause capital tax gains to the seller (Smith, 1977) while OO do not. Concerns regarding the choice between RI and OO are also expressed by the UK Monopolies and Mergers Commission (MMC, 1999).[5] RI might be subject to capital tax gains, while they might be more time consuming due to the extension of the offer period by two-three weeks if an EGM is needed to authorise the PALs (the rights) before being tradable. For the above reasons, the RI are not particularly famous.

2.3.3. Discounting

SEO are usually offered at discount to the prevailing market prive prior the offer. Evidence on SEO discount is reported regardless the issue being underwritten or not, and regardless the SEO type being RI, OO, BD or PP. Discount is documented in various markets such as in the US (Hansen, 1988; Loderer et al, 1991; Wruck, 1989; Eckbo and Masulis, 1992; 2007; Hertzel and Smith, 1993; Corwin, 2003; Altinkilic and Hansen, 2003; 2007; Gao and Ritter, 2008), UK (Armitage, 2000; 2002; 2007; Korteweg and Renneboog, 2002, Slovin et al., 2000; Barnes and Walker, 2006; Balachandran et al., 2009), Greece (Tsangarakis, 1996), Netherlands (Kabir and Roosenboom, 2003; De Jong and Veld, 2001) and Japan (Kang and Stulz, 1996). Contrary, Tan et al. (2002) report premiums for Singapore PP. Discounting could in fact be seen as the most important indirect flotation cost (Eckbo et al., 2007).

Details on the discount determinants can be found in Chapter 4.[6] However, the most dominant explanations are in line with the view that it is necessary to compensate investors for costs or risks they undertake. The discount is needed to 'bribe' investors in order to invest into a relatively overvalued stock consistent with the Myers and Majluf model (Eckbo and Masulis, 1992). Given the asymmetric information between the firm and the market, the offering is also associated with a certain level of risk that investors are exposed to. Investors will incur investigation expenses and

[5] Monopolies and Mergers Commission is a former UK body which was responsible for investigating non-competitivepractices. In 1999, it was replaced by the Competition Commission.

[6] Eckbo et al. (2007, Table 8) describes the variables used to explain the discount by various papers examining US SEO.

undertake uncertainty for which the require discount. (see Korteweg and Renneboog, 2002; Armitage 2002). Alternatively, the discount is necessary to compensate investors for the illiquidity costs and risks they undertake, as SEO are mainly illiquid stocks (Corwin, 2003; Altinkilic and Hansen, 2003; Armitage, 2007; Loderer et al., 1991; Barclay and Litzenberger, 1988).

Specifically for the PP, the stock involves greater levels of information asymmetries (e.g. Wu, 2004). US findings suggest the discount reflects costs incurred by the private investors to acquire the necessary information and certify the stock (Hertzel and Smith, 1993). Contrary, agency theories attribute the discount to costs incurred to monitor the management (Wruck, 1989) or even to entrench the incumbents (Barclay et al., 2007; Wu, 2004). Such arguments for PP have not been tested for the UK market.

Finally, recall that the offered price in the US is set by the underwriter after the book-building, while in the UK it is set the evening prior the announcement and remains fixed until the issue day. This flexibility in the US motivates studies to examine incentives that might take place during the offer period that affect the underwriter decision to set the discount, such as short-selling activities (Kim and Shin, 2004; Sarrieddine and Wilhem, 1996; Gerard and Nanda, 1993). However, such tests *are not applicable* in the UK market as the offered price is set ex-ante the announcement and cannot alter.

2.3.4. Announcement market reactions

As mentioned, SEO are associated with negative market reactions to the announcement. Distinguishing by offer type, such findings are consistent with US RI (Hansen, 1988; Ekcbo and Masulis, 1992; Singh, 1997) and US BD (Asquith and Mullins, 1986; Smith, 1977; Masulis and Korwar, 1986). These reactions are attributed to adverse selection problems. The SEO signals that the issue proceeds exceed the intrinsic value of the funded 'project' in the spirit of Myers and Majluf (1984). Alternatively, the reactions are attributed to inelastic demand which causes downward pressure on market prices (1972; Loderer et al., 1991; Altinkilic and Hansen, 2003; Corwin, 2003). In fact, Barclay and Litzenberger (1988) argue that the

negative change in market price between the announcement and issue day should reflect the placing discount.

Likewise, evidence referring to other markets documents mainly negative market reactions on SEO, while some positive response is also documented. Specifically, Bohren et al. (1997) report negative announcement reactions for underwritten RI in Norway. Kabir and Roosenboom (2003) and De Jong and Veld (2001) report negative reactions for Dutch RI, Gajewski and Ginglinger (2002) for France, Loderer and Zimmerman (1988) for Switzerland, Eckbo and Verma (1992) for Canada, MacCulloch and Emanuel (1994) and Mearsden (2000) for New Zealand. Contrary, evidence for Japan (Kang et al., 1999; Kato and Schallheim, 1993; Kang and Stulz, 1996), Greece (Tsangarakis, 1996), Finland (Hietala and Loyttyniemi, 1991) and Singapore (Tan et al., 2002) suggests positive reactions. Swedish RI cause positive reactions for 1986-1997 (Cronqvist and Nilsson, 2005) but negative for 1980-1994 (Molin, 1996).[7]

The different market reactions amongst the countries are due to the different settings, different market size and liquidity, different tax and regulatory systems (Korteweg and Renneboog, 2002). With regards to the UK market, Marsh (1979), Burton et al. (1999), Korteweg and Renneboog (2002) and Armitage (2002) report negative market reactions to RI, with the non-underwritten rights to experience the most severe price effect (Korteweg and Renneboog, 2002). Interestingly, less adverse information signals associated with RI are reported prior to 1986 that firms mandatory issued RI (distinction between high and low quality UK firms was not possible). After the deregulation period, the firms were able to differentiate themselves. By choosing placings they signal quality and potential increase of external monitoring as reactions are positive (Slovin et al., 2000).

Barnes and Walker (2006) extend the Slovin et al. (2000) study and use a sample starting from mid-1990s. They hence capture the deregulation of 1996 Companies Act (which allows firms not to publish prospectus for placings below the 5% of the

[7] Korteweg and Renneboog (2002, Table 1) also document market reactions of international SEO types: negative for the UK, US, New Zeeland, Netherlands, Sweden, and positive for Korea, Greece, Finland Norway, Switzerland and Japan.

share capital). Still, negative market reactions for RI and positive for placings are reported, suggesting RI adverse selection and placing quality information.

The UK market reacts more favourable to placings. Korteweg and Renneboog (2002) report positive but statistically insignificant reactions, while Slovin et al. (2000) document significantly positive to placings. Balachardan et al. (2009) also report positive reactions for placings with OO and for accelerated book-builded placings. Similarly, OO document significantly positive reactions (Korteweg and Renneboog, 2002; Armitage, 2002) which is consistent again with the view that the market interprets OO firms as having higher quality (in comparison with RI).

Furthermore, when a US PP is announced, the market reacts positively, as value improvements are expected (Wruck, 1989; Hertzel and Smith, 1993; Barclay et al., 2007; Folta and Janney, 2003). Silber (1991) and Maynes and Pandes (2008) report similar findings for US and Canadian restricted PP.[8] Likewise, positive reactions are also found for Japanese PP (Kang and Stulz, 1996; Kato and Schallheim, 1993), for Hong-Kong (Wu et al., 2005). Thereby, the implications of the placings in the UK are closer to the US PP rather than BD (contrary to Slovin et al. (2000) definition of UK placings being similar to BD). Slovin et al. (2000) argue that the positive reactions of UK placings are due to the higher underwriting risks in the UK, which certify offer. This contradicts the US BD which report negative reactions. However, the difference in the reactions is not about underwriting certification but about firm quality similar to the US PP. Lower quality firms are not willing to pay the underwriter fee (Armitage, 2002). The fee is mainly to guarantee the offer and reduce the risk of unsold stock.

Finally, Wu and Wang (2005) argue that the market reactions could vary according to agency problems, which affect the signals sent to the market. They refer to over- and under-investment problems associated with the SEO, due to private benefits.

[8] Restricted placements cannot be sold in the market within two years from the event (see Wu, 2004, p.96). The methods and number of sales are also restricted (Securities Act Rule 144). Regulations D and S frame the restricted private placements sold in the US and outside the US, respectively. Additionally, restricted placings under regulation D are exempt from SEC-mandated disclosure requirements (i.e. prospectuses issue and mandatory information disclosure).

These allow for both, positive and negative market reactions (based on how the market interprets the offer).

2.3.5. Long-horizon abnormal performance

In the long-run, US SEO underperform their benchmarks (e.g. Loughran and Ritter, 1997; Lee, 1997; Teoh et al., 1998; Spiess and Affleck-Graves, 1995; McLeughlin et al., 1996; Mitchell and Stafford, 2000). Similar findings are reported for Japanese SEO (Cai and Loughran, 1998; Cai et al., 1999), Japanese RI (Cai, 1998), Dutch RI (Kabir and Roosenboom, 2003) and Korean SEO (Yoon and Miller, 2002). In the UK, evidence is similar in the sense that the abnormal performance following RI becomes significantly negative (Ngatuni et al., 2007; Levis, 1995; Andrikopoulos, 2009). Little evidence of long-run underperformance of OO is also reported (Iqbal et al., 2009; Ngatuni et al., 2007).

The common explanation for the negative market reactions at the announcement (of RI and US BD) but deeper underperformance few years later is that investors underreact when the SEO is announced (Loughran and Ritter, 1997). The market realises the true firm value with a delay. However, with regards to the Japanese market, *AR* do not follow the underreaction hypothesis. The reactions are positive at the announcement (Kang et al., 1999; Kato and Schallheim, 1993; Kang and Stulz, 1996). Similar findings are also implied for UK OO. They, thus, suggest overreaction consistent with the evidence for US private placements (Hertzel et al., 2002). In fact, US and Japanese PP experience negative abnormal performance few years after the event (see Hertzel et al., 2002; Sheehan and Swisher, 1998; Barclay et al., 2007 for US and Kang et al., 1999 for Japan).

Hereby, (private) placings are associated with different implications in comparison with public offers. Krishnamuthy et al. (2005) suggests that the underperformance of US PP is related to firm bad financial situation and investor activity. Controlling for these, the long-horizon underperformance is eliminated. Wruck and Wu (2009) argue that when investors are related to the PP firm and have strong ties, the highest value is added. The relationships are 'multi-dimensional' and could constitute hierarchy for business choices to add value. Cronqvist and Nilsson (2004) also document that

30.5% of the Swedish PP establish a product relationship. Such findings are sparse for UK (private) placings.

2.3.6. Secondary placements

Finally, the US literature investigates the post-performance surrounding secondary placements (Barclay and Holderness, 1991; Bethel et al., 1998, Allen and Philips, 2000). They report over-performance when active, affiliated and/or corporate investor participates in the placing. In particular, Bethel et al. (1998) classify investors based on their intentions to activists, financial and strategic investors. Activist group appears to prefer more diversified stocks which underperform, in order to increase performance by cutting down operations (effective restructuring).

Placings of existing shares by active investors could also constitute corporate control transactions (Barclay and Holderness, 1991; Allen and Philips, 2000). Inconsistent with the monitoring theory (Wruck, 1989), ownership concentration maintains constant as the share blocks go from the block seller to the block buyer, keeping ownership levels constant (Barclay and Holderness, 1991). Corporate investors do not target underinvestment or illiquid companies that need money to survive or expand (Allen and Phillips, 2000). Rather, corporate ownership creates synergies. The identity and (managerial) skills of the investors could enhance firm value (Barclay and Holderness, 1991) and/or create product market relationships such as alliances and joint ventures (Allen and Phillips, 2000). This provides benefits of monitoring management and mitigating investment opportunities information.

Overall, investor identity is positively related to abnormal top management turnovers and long-term performance (see Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Philips, 2000; Wruck and Wu, 2009 for the US market). However, there is no similar evidence with regards to the UK market. As a conclusion, the lack of such UK evidence inter alia pinpoints the motivation to investigate UK secondary offerings. The fact that evidence on non pre-emptive equity offerings in the UK sparse (primary and secondary placings), whilst different settings and implications characterize the UK market, provide a motivation to investigate these two types of equity offerings in the UK.

2.4. Summary and conclusions

The objective of this chapter is to describe the UK equity offerings area. It provides a description of the market, in terms of institutional settings and procedures. It also reviews the existing evidence and identifies gaps in the literature. Although it compares two developed, 'common law countries', i.e. UK and US (La Porta et al., 1998), international findings are also reported. Table 2.1 gathers the most prominent information and emphasises on how this study contributes to the extant literature, given the different settings of the UK market and the lack of (adequate) evidence on UK non pre-emptive offerings.

More specifically, equity offerings in the UK usually have a 'first refusal right'. New equity is automatically offered first to existing shareholders on a pro-rata basis and then to outside investors. Disapplication of the pre-emptive rights is allowed under certain circumstances. Nowadays, the common issuing method is an open offer accompanied by a placing (Barnes and Walker, 2006). Contrary, in the US, the so called firm commitment offers, or bought deals dominate while pre-emptive rights are rarely used. When a (private) placing takes place, the two countries are subject to different disclosure requirements, with the UK being less informative.

A few further important issues worth attention. First, the UK offered price is set at the announcement and remains fixed until the issue day. This contradicts the US offers, as the price is set at the end of the offered period, after the underwriter observes the market reactions and stock valuations. Thus, the price setup in US provides flexibility and lower risks. Second, the US models regarding the issue method preferences, adverse selection problems and market reactions are not applicable into the UK (Slovin et al., 2000; Korteweg and Renneboog, 2002). Third, private placements investors participating into UK placements are mainly existing shareholders (Armitage, 2010), contrary to the US findings that refer to new investors (Bethel et al., 1998; Wruck and Wu, 2009). Hence, different investor incentives are plausible. Finally, little evidence exists regarding UK placings, while evidence on transactions with already listed shares do not seem to exist at all.

For these reasons, the UK provides a suitable and interesting setting to investigate the implications of these two non pre-emptive samples, such as their discount,

market reactions and long-run performance. These issues facilitate in contributing to the extant literature.

Table 2.1: Differences between UK and US settings & motivations

RI stands for right issues, OO for open offers, PP for private placements, BD for bought deals or firm commitment offers.

Key institutional settings & evidence	UK	US	Sources of motivation
1. Pre-emptive rights	Automatic impose unless: - waived in advance - EGM resolutions for disapplication	No	
2. Issue types	-RI, OO, placings (RI, OO are pre-emptive offers)	BD, PP	- *US models for SEO choice & market reactions are not applicable in UK*
3. Offer price	- Price setup before the announcement - Price remains fixed during the offer period - No flexibility	- Road shows during the offer period - Price setup immediately after the offer period - Flexibility to revalue the stock - Manipulation during the offer period can affect the discount	- *Higher underwriter risks in the UK* - *Manipulative short-selling during the offer period cannot affect the discount in the UK* - *Different incentives in US & UK*
4. Investor identity	- Mainly existing shareholders	- New investors - Corporate, affiliated, active	- *Different incentives in US & UK*
5. Non pre-emptive equity offers	- Little evidence on placings - Placings offered at discount - Positive market reactions for placings - No evidence on secondary offers	- PP offered at discount - Positive market reactions for PP - Negative long-run *AR* - Positive post-event performance for secondary placings	- *Gaps in the literature regarding non pre-emptive offers in the UK*
6. Disclosure requirements on non pre-emptive offers	- Publish prospectus if placing $\geq$10% of sh.cap - Common practice to publish prospectus if the offer is $\geq$ 5% of sh.cap - No requirement for registration of secondary offers - News reports	- File exhibits for the SEC registered PP (common evidence refers to registered PP) - No disclosure requirements for unregistered PP	- *Relative opacity in the UK* *Different implications in US & UK*

Chapter 3 : Long-horizon Abnormal Performance. Review of the Research Design Debate

3.1. Introduction

This chapter focuses on the first part the third research objective (*Obj.3*). It reviews the debate on long-run abnormal performance approach and, explains the underlying problems associated with each method. It also attempts to provide suggestions on how to choose among the alternative methods and, how the extant literature can be expanded.

The chapter is structured as follows. Section 3.2 explains the motivation of the chapter and its contributions. Section 3.3 describes the theoretical framework behind the stock long-run event-study methodology and the several applicable models of expected performance. It illustrates the rationale of the so called 'bad model problem' and how this might affect the reliability of the estimated abnormal returns (*AR*). Section 3.4 analyses the existing debate regarding the choice of an appropriate method. Section 3.5 explains the econometric problems of *AR* and how the literature attempts to overcome the faults. Section 3.6 provides a brief guidance on the selection of an appropriate approach for valid inferences. Section 3.7 relates stock and operating abnormal performance methods and, the last section 3.8 concludes.

3.2. Motivation and main contributions of the chapter

Event studies are the main tool used to evaluate major managerial decisions such as earnings announcements, dividend payments, SEO, initial public offerings (IPO), mergers and acquisitions (M&A), corporate governance information and/or other corporate event. The basic intuition of event studies is the comparison of the event firm return R_{event} with the return of a corresponding benchmark R_{bench} over the same period of time. The rationale is that benchmark returns reflect the expected returns of

the even firm $R_{bench} = E(R_{event})$. Assuming market efficiency, the null hypothesis is zero abnormal returns, AR ($AR = R_{event} - R_{bench} = 0$). That is due to the assumption that any delay in the response of new information is alive only for few days (expected returns are close to zero; Fama, 1998).

Various studies focus on event-studies since their origin (Fisher et al., 1969). As an example, few review studies focus on the 'traditional' few-day AR around a specific event (e.g. Campbell et al., 1997; MacKinlay, 1997; Armitage, 1995; Strong, 1992; Smith, 1986). However, contrary to few-day AR that are reliable in the sense that they are well specified and not to particularly sensitive to the event-study method applied (Fama, 1998; Ikenberry et al., 1995; Armitage, 1995; Kothari and Warner, 2007), long-run AR are not (details are provided later). For this reason the current study emphasises on long-run abnormal performance. Kothari and Warner (2007) focus on the econometrics of event studies and stress the increasing use of event-studies over time among the top five journals in finance (from 1974-2000). They refer to MacKinlay (1997) and Campbell et al. (1997) as the 'the origins and breadth' of event studies (Kothari and Warner, 2007, p.7), implying how important event-studies have become. Both of these latter studies survey articles that use event-studies and refer to problems that researchers need to consider.

Given the increasing use of event studies up to date as well as the several problems they face (Fama, 1998), clear understanding of the pertinent issues is essential. This becomes apparent mainly during the post-Fama (1998) period, who was the first to summarize the bad-model problems and to suggest a calendar-time approach as an event-study tool. Fama (1998, p.299) argues that no model could tell a 'perfect story'. The models misspecify the expected performance mainly of small stocks with low book-to-market ratio whilst they are subject to several econometric problems and assumptions. After that, two competing long-run AR approaches dominate, namely the calendar-time AR and buy-and-hold AR.[9]

[9] Calendar-time AR requires the application of an accepted capital asset-pricing model and a Jensen-alpha approach (as applied by Jaffe, 1974 and Mandelker, 1974). Buy-and-hold AR could also use an asset-pricing model, but it is common to use mimicking factor portfolios and/or single non-event control firms based on common risk factors. They are thus very much correlated with the success of the asset-pricing literature.

Binder (1998) focuses in the extensions of the original event-study methodology. However, it does not include any discussions about the buy-and-hold or calendar-time *AR* approaches, the bad-model problem or the recent developments in the extant literature. Methodological long-horizon event-study articles such as Kothari and Warner (1997), Barber and Lyon (1997), Lyon et al., (1999), Brav (2000), Jegadeesh and Karceski (2009) attempt to improve the extant literature using simulated or real-event datasets. Indeed, they suggest solutions such as calendar-time portfolios (Fama, 1998; Mitchell and Stafford, 2000), careful portfolio construction and non-parametric bootstrap approaches for statistical inference (Ikenberry et al., 1995; Lyon et all., 1999). Nonetheless, concerns about their power exists (e.g. Kothari and Warner, 2007). Doubts on whether the reported abnormal performance is attributed to the event or to model misspecifications have also been raised (e.g. Brav and Gompers, 1997; Fama, 1998; Eckbo et al., 2000). Hence, extreme caution is needed.

This chapter contributes to the area in several ways. It builds upon the existing evidence and contributes mainly by providing guidance on the choices/alternatives of how to measure long-horizon *AR*. To do so, it considers the testable hypothesis and dataset nature that a research project might have. It gathers the most significant issues discussed by the relevant literature and presents the rationale of the long-run event-study research design debate. After synthesizing the implications derived from contributions of prior studies, it provides suggestions for further research that could expand the extant literature.

In sequence, the chapter considers the frequent application of both, stock and operating abnormal performance by corporate finance articles (e.g. Hertzel et al., 2002; Loughran and Ritter, 1997; Teoh et al., 1998b) as well as by market based accounting literature (see the review of Kothari (2001) that refers to applications of event-studies in accounting literature). On that basis, the current study explains the pertinent issues on operating performance. While it is based on fundamental ratio analysis, it is also subject to the bad-model problem (Brown and Warner, 1986; Barber and Lyon, 1996). Perhaps, its biggest flaw is the dependence of accounting items to historic cost and managerial discretion. In short, this chapter has potential

interest for research areas closed to corporate and behaviour finance, market based accounting, as well as anomalies, asset pricing and market efficiency.

3.3. Theoretical framework on the model of normal or expected performance

3.3.1. Asset pricing models and Cumulative Abnormal Returns (CAR)

A common way to assess stock abnormal performance is to apply a capital asset-pricing model, as derives by the financial theory. This concept implies the use of the market factor as benchmark and, examines whether significant errors exist between the expected (estimated) firm returns and realized ones, over specific periods of time. It is based upon the assumption that the model can actually estimate the expected firm returns. In fact, all asset-pricing models are subject to a joint-hypothesis test (Fama, 1973; 1998), that the market is efficient (Fama, 1970; 1991) and that the model is able to measure the variation of expected returns.

A substantial amount of papers investigates the market efficiency and identifies *AR* using as benchmark several variations of the known traditional market model:

$$R_{j,t} = a_j + b_j R_{M,t} \qquad \text{Eq. 3:1}$$

$R_{j,t}$ is the return on a security j on time t, $R_{M,t}$ is the return on the market factor, a_j and b_j are the regression coefficients. Returns could be discrete $\{R_t = \frac{\text{Price}_t + Dividend - \text{Price}_{t-1}}{\text{Price}_{t-1}}\}$ or logarithmic $\{R_t = \log\left(\frac{\text{Price}_t + Dividend}{\text{Price}_{t-1}}\right)\}$. Strong (1992) advocates that logarithmic returns should be preferable for theoretical and empirical reasons. 'Theoretically, logarithmic returns are analytically more tractable when linking together sub-period returns to form returns over longer intervals. Empirically, they are more likely to be normally distributed and so conform to the assumptions of standard statistical techniques' (ibid, p. 535).

To estimate any *AR* from the above relationship (Eq.3:1) one should first regress the returns of the security j (in a time-series manner) over the market return for a certain period of time (e.g. -250 days to -30 prior the event). After replacing the estimated

values of $\hat{a}_j, \hat{b}_j$ in Eq.3:1, the outcome is the expected (estimated) return $E(R_{j,t})$. The difference between the estimated and the actual returns is the abnormal: $AR_{j,t} = R_{j,t} - E(R_{j,t}) = R_{j,t} - (\hat{a}_j + \hat{b}_j R_{m,t})$. Cumulating the daily or monthly AR provides the abnormal performance of the total period tested:

$$CAR_{j,T} = \sum_{t=1}^{T} AR_{j,t} = \sum_{t=1}^{T} [R_{j,t} - (\hat{a}_j + \hat{b}_j R_{m,t})] \qquad \text{Eq. 3:2}$$

Logarithmic returns are also common, so that continues compounding is taken into account. Few versions of the market model are applicable, depending on the hypothesis tested. The simplified so called *Index model* (Lakonishok and Vermaelen, 1990), implicitly assumes that a_j=0 and b_j=1. Therefore, the expected return on a stock j equals the return on the market $R_{M,t}$ over a specific period of time $(E(R_{j,t}) = R_{M,t})$. In addition, the Capital Asset Pricing Model, *CAPM* (Sharpe, 1964; Merton, 1973) which derives from a whole set of theoretical assumptions (that can be found even in any corporate finance text-book) is a widely used market model:

$$R_{j,t} = R_{f,t} + b_j(R_{M,t} - R_{f,t}) \qquad \text{Eq. 3:3}$$

R_f stands for the risk free rate. The $E(R_{j,t})$ is therefore subject to changes depending on the chosen benchmark. The above models are widely applied and, provide valid estimations in short-horizon event studies. Applying the models for few-day event windows results are qualitatively the same as applying a more complicated model (Armitage, 1995; Ikenberry et al., 1995). Nevertheless, it seems that none is fully acceptable when it is empirically applied for long periods. The asset-pricing literature suggests that they are not completely able to describe the cross-section variation of the expected returns for long periods (e.g. Fama and French, 1993; 1995; Lakonishok et al., 1994). The above models ignore risk factors such as size and book-to-market (BTM), which are indicated to be arbitrary variables related to risk factors beyond the market. Both variables control for contrarian strategies.[10]

[10] Contrarian strategies involve the investment intovalue stocks (stocks with low market value relative to other fundamental values) that outperform growth ones in the long-run (growth (or glamour stocks) are those that have high market value relative to fundamental ones). See more in section 3.3.2).

The Fama and French (1993) three-factor model (hereafter FF-3factor) confirms that portfolios constructed to mimic risk factors related to size and BTM add substantially to the variation in stock returns explained by a simple market portfolio. It represents a more precise model to look for anomalies in expected returns:

$$R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + s_j SMB_t + h_j HML_t + e_{j,t} \qquad \text{Eq. 3:4}$$

SMB is the premium on the size portfolio (market capitalization) which distinguishes the securities of the market into small and big capitalization securities. *HML* is the premium on the growth portfolio which distinguishes the securities in the market into high and low growth (BTM) securities. Based on the original FF-3factor model, firms are sorted according to their market value at the end of each June and allocated into small and big stocks based on their median value. The stocks are subsequently sorted into stocks with small, medium and high BTM value based on the bottom 30%, middle 40% and top 30%, forming six portfolios. Once their returns are assessed, *SML* is calculated as the difference between the average return of three small portfolios minus the average of the three big ones. Similarly, *HML* is the difference between the average return of the two high minus the two low BTM portfolio returns. Practical applications of the FF-3factor model deviate by allowing the construction of the *SMB* and *HML* to vary.

Specifically, several portfolio combinations are used by the literature. Among the most popular ways is to follow the Fama and French (1993; 1995; 1996) and estimate the 6 portfolios. However, it is also common to form 16 size and BTM portfolios (4 size quartiles x 4 BTM quartiles), 25 portfolios (5 size quintiles x 5 BTM quintiles), 50 portfolios (10 x 5), 100 portfolios (10 x 10). Scholars also use several breakpoints, beyond the original FF-3factor, e.g. the size breakpoints could be based on the 10th or 70th percentile, whereas the BTM breakpoints could be one third of the size portfolio, 40th and 60th portfolios, and so on. Sorting deviations are also valid (see for example the empirical review of Michou et al., 2007). Finally, the average return of the portfolios could be either equal or market value weighted. Apparently, the choices depend on the market of investigation and the requirement of a proper allocation of the market firms. The model estimations might change according to the choices made.

Beyond the SMB and HML, evidence suggests firms with higher performance perform worse during the long-run, while firms with low performance tend over-perform during the long-run (e.g. Jegadeesh and Titman, 1993). Therfore, not only contrarian strategies, but also momentum strategies should be taken into account when estimating expected and abnormal returns. The intercept $\hat{a}_j$ might be biased due to momentum strategies (Fama and French, 1996). On that basis, Carhart (1997) four-factor model (hereafter Carhart-4factor) augments the FF-3factor model by adding a momentum factor $PR1YR_t$ which accounts for investor momentum strategies. $PR1YR_t$ is defined as the average return of firms with the highest 30% 11-month returns (lagged 1-month), minus the average return of firms with the lowest 30% 11-month return (lagged 1-month). It is advocated to improve the average pricing errors of the CAPM and FF-3factor models:

$$R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + s_j SMB_t + h_j HML_t + p_j PR1YR_t + e_{j,t} \qquad \text{Eq. 3:5}$$

Carhart-4factor documents low cross-correlation which implies that multicollinearity does not substantially affect the estimated four-factor model. Table 3.1 summarises the studies that use the mentioned models as event-study tools.

3.3.2. Portfolio and/or single-firm matching

In an attempt to measure long-term abnormal performance, scholars use a model that is able to tell an adequate economic story and estimate accurate expected returns (as possible it can be). More recent studies also apply *control portfolio* or *single firm-matching* approaches. They create size and BTM portfolios which are used as benchmarks and compute long-term abnormal performance. The event-returns are simply compared with the returns of the control portfolio which is designed to have similar risk (size, BTM, beta estimations, performance and other), without the application of the asset-pricing model itself.

It is worthwhile that the use of constructed portfolios or single-control approaches (rather than pricing-model application) overcome the join-hypothesis test. It does not directly examine the efficiency hypothesis, but whether known patterns are captured

by both samples: since the two samples have similar size, growth, industry and/or return dimensions, their expected long-run returns should be common. Portfolios or single-matching approaches overcome the linearity assumption between the model estimates, and the independence assumption between the asset-pricing factors (see more in section 3.4). For this, asset-pricing models are more sensitive to the bad-model problem.

3.3.1. Buy-and-Hold Abnormal Returns (BHAR)

Equally popular approach of long-term abnormal performance is the buy-and-hold abnormal return (*BHAR*) method. Alike cumulative returns, buy-and-hold approach has its basic intuition to the use of an appropriate benchmark for the event sample. The main difference of *BHAR*, is that periodical compounding is taken into account for the whole period tested. The abnormal buy-and-hold return of each event firm j, $BHAR_{j,t,T}$, is the difference between its realized and expected buy-and-hold return:

$$BHAR_{j,t,T} = \left[\prod_{t=\tau}^{T}\left(1+R_{j,t}\right)-1\right]-\left[\prod_{t=\tau}^{T}\left(1+E(R_{i,t}\right)-1\right] \qquad \text{Eq. 3:6}$$

Where $R_{j,t}$ is the return on the event security j over the month t, and $E(R_{j,t})$ is the expected return which equals the return of the corresponding benchmark. τ represents the start of the event window and T the total period tested. It is supported that *BHAR* approach has the advantage of being more realistic than *CAR* as it takes periodical compounding into account (Loughran and Ritter, 1997). *BHAR* lay on the assumption that an investor buys the stock at the beginning of the event window and holds the stock for the whole period tested. If he/she exits the investment earlier, his/hers realized returns will depend on the holding period.

The benchmark in estimating *BHAR* could again vary. A very common attitude is to construct mimicking factor portfolios based on similar pre-event characteristics and subsequently estimate their holding period returns (e.g. Ikenberry et al, 1995; Lyon et al., 1999). Choosing a single non-event matching firm for each event return is also common (e.g. Barber and Lyon, 1997). The application of an asset-pricing model could result to *BHAR*, although it is less commonly used. Table 3.1 indicates examples of articles that use the *BHAR* approach along the benchmark they use.

3.3.2. Ability of the model to explain *E(R)*

This section provides more information on the rationale about the debate in choosing appropriate model and/or risk factors. More specifically, all common asset pricing models have systematic problems in explaining the average (expected) returns, mainly for small securities with low BTM. The models predict strong growth for low BTM stocks (glamour or growth stocks) and poor growth for high BTM (value) stocks. However, the high growth of glamour stocks deteriorates after the portfolio formation, while the low growth of value stocks increases. As a result, returns reverse over the years (Fama and French, 1992; 1993; 1995). This bad-model problem is observable in all *AR* methods that use size and BTM as risk factors.

Several early and more recent studies document reverse direction of returns (and earnings) before and after the portfolio constructions, especially for the small and low BTM firms. This convergence is attributed by the literature mainly into two alternatives. Fama and French (1992) suggest that the ultimately higher performance of high BTM firms is due to the fact that value firms are riskier (the book-to-market anomaly). A firm with high BTM signals sustained low performance prior the portfolio constructions and vice versa (Fama and French, 1995). For that reason the BTM indicates positive relationship with the delivered average returns (value premium). Thus, investors over-estimate the low BTM stocks and under-estimate the high BTM.

A second alternative interpretation is that, investors are naïve and do not understand the difference between small-big and high-low BTM stocks (market inefficiency). Lakonishok et al. (1994) argue that the market does not understand the similarity in returns/earnings between glamour and value stocks. They systematically ignore the fact that future growth rates are mean reverting and, assume glamour firms will continue grow faster than value firms. The reversal corrects systematic expectation errors and irrational pricing.

Similar arguments are implied by older studies as well. For instant, De Bondt and Thaler (1987) attribute the reversal to investor overreaction. At the event period, the market expects more than it should and overvalues the stock. Therefore, during the

long-run the true firm value is revealed and reverses. Ikenberry et al. (1995) do not report reversal but highly significant *AR* increase along the time for value companies. These reactions are attributed to the traditional signalling theory and information asymmetry factors. They argue that if the market was efficient (Fama, 1970; 1991; Ross, 2005) it wouldn't need so much time to react to the announcement and adjust for the new information. The behaviour finance interpretations allows for miss-pricings and miss-understandings. Other studies even challenge the 'status' of BTM as a risk factor (Haugen, 1995; Brav et al., 2005).

Of course, an extensive number of studies focus in asset pricing model improvements examining various investor strategies. A brief but comprehensive review in Fama (1998, p.285-291) discusses the results of prior studies that seem to reject market efficiency due to over/under-reactions and reversals in *AR*. Likewise, an interesting paper by Malkiel (2003) provides a good description on the critics of the efficient market hypothesis (which is jointly tested with a pricing model of equilibrium). However, the purpose of this study is to explain the rationale of the debate in event-studies, rather than the asset pricing literature itself. Thus, the description in the development of the asset pricing literature is limited to few key papers.[11]

The concerns regarding the ability of the pricing models to predict correctly the expected returns on securities create concerns about the validity of the long-run event studies. Brav and Gompers (1997) suggest that 'event anomalies' are actually manifestations of known pricing deficiencies of the pricing model. The literature concerns that if the market does not understand that the return growth tends to mean revert, stock prices at the event time would be too high by default. If the market

[11] Overall, several studies report reversals by examining the over/under-reaction hypotheses, seasonality, market efficiency, anomalies. See for example Daniel and Titman (1997) that focus on the characteristics of the portfolio firms observing seasonalities in their returns. Aiming to improve prior model predictions they argue that firm characteristics (size and BTM) are what actually explain the cross-section variation in expected returns rather than the returns of the corresponding factors. Contrary, Davis et al. (2000) suggest the value premium and BTM anomaly are not sample specific and thus, the FF-3 factor model seems able to explain the anomaly better than that of Daniel and Titman (1997). See also other pertinent studies examining reversals, anomalies and seasonalities such as Ball and Brown (1968); Black (1986); De Bond and Thaler (1985); Bernard and Thomas (1990); Ritter (1988; 1991); Agrawal et al., (1992); Chopra et al. (1992); Jegadeesh and Titman (1993); Cusatis et al. (1993); Ikenbery and Lakonishok (1993); Loughran and Ritter (1995); Dharan and Ikenbery (1995); Shleifer and Vishny (1997); Antweiler and Frank (2006) and others.

realizes its mistake gradually, prices and returns will be corrected in a future time, justifying the reversal.

Further concern of the reversal is when events such as IPO and SEO are under examination. IPO and SEO firms tend to belong to the small/high growth firm groups which are mainly the groups that indicate the most misspecifications. Note that IPO and SEO display strong stock returns in the years prior to the issue which reverse afterwards.[12] This suggests underperformance following the specific corporate event. If the model cannot capture the cross-section variation of *E(R)* properly, a long-horizon event study would be misspecified. The estimated *AR* would be miss-leading on drawing conclusions related to the event. Would the reported *AR* attributed to the event or to model misspecifications?

3.3.3. Calendar-Time Abnormal Returns (CTAR)

Therefore, all long-run event-study approaches are subject to the mentioned bad-model problem and are incomplete in terms of capturing the expected returns. In addition, long-run *AR* are subject to further problems such as new listing bias, rebalancing, survivorship, dependence, violation of the normality assumption (see details in section 3.4). Hence, it is likely that 'no method can minimize the bad-model problems for all classes of events' (Fama, 1998, p.299). For that reason, Fama (1998) strongly advocates for a *calendar-time portfolio approach* with which the long-run *AR* can be statistically more reliable. He suggests the use of an asset-pricing model with a Jensen-alpha approach, similar to Jaffe (1974) and Mandelker (1974). As size and BTM appear significant risk factors, he suggests a variation of the FF-3factor model in a calendar-time approach, as follows:

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t} \qquad \text{Eq. 3:7}$$

Based on the calendar time abnormal return (*CTAR*) approach, the unit of investigation is each calendar month, not each event as the event-time returns discussed earlier. An event portfolio *p* is formed which is rebalanced every calendar

[12] See studies such as Ritter (1991); Loughran and Ritter (1995); Spiess and Affleck-Graves (1995); Mitchell and Stafford (2000); Gompers and Lerner (2003).

month to include the stocks that have been involved to the event in the previous years (e.g. in the previous 5years/60 months or other period based on the tested event window). $R_{p,t}$ includes the monthly returns on the event-portfolio p (equally or value weighted). The monthly average return of the companies included in p the specific month, represents the portfolio monthly return. Having estimated the average returns of p for the months included in the tested period, a time-series regression against the FF-3factor model is run.

The intercept a_p of the time-series regression represents the average AR for the period tested. After controlling for the size and BTM factors, a significant positive intercept indicates over-performance and vice versa. This suggests that the event-portfolio has performed better or worse than expected (the null hypothesis is zero intercept a_p for all assets).[13] This approach is widely used by the recent literature (see Table 3.1). Similar to a Fama-MacBeth approach (Fama and MacBeth, 1973),[14] the Jensen-alpha could be applied with any model. It is argued that it overcomes econometric problems such as cross-sectional dependence and heteroskedasticity (details are provided in the following sections).

It is important to make clear that monthly benchmark rebalancing is likely to occur under each of the previous methods apart from the single match-firms approach. The firms constitute the market factor, index or constructed portfolio change periodically due to the fact that new firms are listed or existing firms disappear. This causes unavoidable benchmark rebalancing over the period tested.

Regardless the evidence related to the bad-model problem, researchers such as Kothari and Warner (1997) and Jegadeesh (2000) document that long-term AR are not sensitive to the benchmark used. Specifically, Jegadeesh (2000) argues that

[13] Note that when the original FF-3factor model is applied as in Eq.3:4, the monthly returns of *each* event-firm are regressed over the model (rather than of p). The original FF application results to a distribution of cross-sectional AR while in $CTAR$ the intercept represents the AR.

[14] The Fama-McBeth approach regresses the monthly security returns $R_{j,t}$ over the actual betas of the security j, as estimated after applying an asset-pricing model, e.g. the CAPM. The beta ($b_{j,t}$) of the stock is used as the independent variable in a second regression as follows: $R_{j,t} = a_{1,t} + a_{2,t} b_{j,t}$. $\alpha_{1,t}$ and $\alpha_{2,t}$ are the cross-sectional regression coefficients. Theoretically, $\alpha_{1,t}$ is the coefficient of a zero-beta portfolio and should equal the risk-free rate. $\alpha_{2,t}$ is the expected performance of the market and, $b_{j,t}$ the actual beta of the security j on the month t. The logic of this two-stage regression approach to measure the expected return of the security j based on its risk over the market portfolio.

studies suggesting miss-valuations because of the benchmark are misleading. After using several benchmarks and controlling for several biases, he reports no sensitivity to the model selection. He examines the long-run performance of firms issuing SEO but, he removes from the potential controls the stocks subject to the event and also all stocks that issue equity during the following period tested. The rationale is that when the benchmark includes the new issues, it partly uses the new issue anomaly to explain itself (Eckbo et al., 2000; see also section 3.4.1 for new listing bias).

3.4. The debate: further bad-model problems and choice of appropriate method

Tests of long-horizon performance have become increasingly common within the academic literature. Two important issues should be taken into account: 1) the power of the model to measure any *AR* (as explained above) and 2) the power of the statistical test that measures *AR* significance or the *AR*. This section describes known problems of long-horizon *AR* that affect the reliability of the estimated performance and increase the probabilities for Type I error (false rejection of the null which is mainly associated with the statistical tests) and Type II error (false acceptance of the null which is mainly associated with the model selection).

3.4.1. New listing bias

Several firms that combine the constructed portfolios or market indexes are newly listed firms (IPO). However, the event firms are usually not (if not IPO firms). Evidence suggests that new listed firms underperform their benchmarks few years after their listing (Ritter, 1991; Loughran and Ritter, 2000; Ritter and Welch, 2002). Worries exist due the suspicion that the IPO underperformance is primarily related to the small firm size and high BTM of newly listed firms, rather than to the IPO event. This suggests that underperformance is related to the failure of the asset-pricing model to capture the variations of small growing firms, which allows for the signalling and behavioural theories to be valid (miss-valuations).

Regardless of the reason that IPO underperform, since they indicate the worse performance for decades (Brav and Gompers, 1997) their returns are not good

indicators for event-firm expected performance. Using IPO returns as benchmark returns might cause upward drift to the estimated *AR* (positive bias).

3.4.2. Rebalancing bias

As mentioned above, the firms constitute the market index or the constructed portfolios change along the time due to the fact that new firms are listed or existing firms disappear/delist. This causes benchmark rebalancing. Rebalancing helps in maintaining the weights of the samples equal (during the months tested). However, a negative bias arises by the fact that when the benchmark portfolios are periodically rebalanced it is implicitly assumed that event-returns are periodically rebalanced as well. Nonetheless, the returns on the event-portfolio are not subject to any rebalancing. The negative bias arises because more successful firms will mainly consist of the portfolio over time. The small and unsuccessful stocks will delist and the event returns will mainly be compared with the more successful ones.

Rebalancing bias is common to all approaches except the *CTAR* and single-control matching firms. *CTAR* approach appears superior to the portfolio and event-time factor analysis approaches, as both samples (event and benchmark) are subject to periodical rebalancing. *CTAR* has two more main advantages. First, it is also free of data availability problems, i.e. when reference portfolios are to be formed or single non-event firms are to be chosen, data for all potential matching firms are required. If for any reason the potential matching company does not have available data for that particular month, it is completely excluded from the matching process and the analysis. However, with periodical rebalancing, the procedure is repeated in each calendar period. This means that all potential matching firms can be taken into account. This is common to all methods using asset pricing models and control portfolios, but not for single matching-firms. Second advantage of the *CTAR* approach is that, with the event portfolio formation the returns of large firms or firms with high BTM are compared with small or low BTM firms, regardless the individual firm size and BTM (not explicit measurement of size and/or BTM). This makes the bad-model problem less apparent. This again holds for the pricing models.

However, event rebalancing also causes problems to *CTAR*. By forming event-portfolios power is likely to be sacrificed (Loughran and Ritter, 1997; Brav and Gompers, 1997). That is because the returns within the event-portfolio are averaged over the months without taking into account the possibility that some months may be heavily event active compared to less active ones (hot versus cold activity periods). In certain periods, events could be significantly different than others. Hence, in events such as SEO that managers are likely to time the offer at particular periods when the stock overperforms (e.g. Hertzel et al., 2002; Loughran and Ritter, 1997; Lee, 1997), *CTAR* with equal weights might not be able to appropriately capture post-abnormal performance. By ignoring the frequency of the event activities, the sum of OLS is minimized, reporting lower *AR*. Thus, its power to detect *AR* is limited (Type II error).

In addition, since the firms in the event-portfolio change through time, factors such as industry clusters are likely to change too (the firms in the portfolio are likely to participate in different industry sectors through time). Hence, the true slopes on the risk factors are time-varying. However, *CTAR* assumes the firm characteristics are stable over time, which is not true (Fama and French, 1997). Since the intercepts can embody factors other than what is explicitly being controlled for (when samples are clustered by calendar time or industry), they may yield misspecified test statistics. This implies poor asset pricing model (Lyon et al, 1999).

Finally, as the firm number is likely to change through time, the portfolio variance is affected. This would probably cause residual heteroskedasticity and misspecify the intercept a_p. To avoid heavy effect of heteroskedastic residuals, it is common by the literature to require at least 10 event firms in each calendar time portfolio (see Hertzel et al., 2002; Mitchell and Stafford, 2000).

3.4.3. Survivorship bias

An issue related to rebalancing is the fact that unavailability data problem arise when an event/match company delists during the tested period. By removing the delisted returns assumes that investors sell the stock at its last trading price. This would provide the actual return of a portfolio. Nevertheless, it is not always feasible to

know ex-ante the last trading price. For example, if a firm delists suddenly without a pre-announcement of its intention to delist, investors might not have the opportunity to sell the stock. Shumway (1997) states that NYSE/AMEX stocks whose delisting is a surprise for the market, usually become useless afterwards. Hence, the delisted return is -100% for the day. If this fact is ignored when estimating the portfolio return which includes the particular stock, the portfolio returns will be biased upwards (see also Shumway and Warther, 1999 for NASDAQ firms). *BHAR* should not be as sensitive to delisted return bias (Shumway, 1997), as they can avoid rebalancing.

To overcome the survivorship bias, two alternative treatments of delisted returns are widely used. First, to drop the firm data after the delisting period or replace the delisted returns with the returns of the corresponding benchmark until the next rebalancing and then to remove it completely (similar to Ritter, 1991; Kothari and Warner, 1997; Lakonishok et al., 1994; Ikenberry et al., 1995; Hertzel et al., 2002). Second treatment, is to replace the delisted returns with the return of the corresponding benchmark for the remaining period tested (e.g. Lyon et al., 1999). Replacing with the corresponding benchmark returns ensure data availability for the whole period tested and it is based on the assumption that investors will re-invest at a similar rate of return as the delisted one. However, replacing the delisted returns would bias the level of reported *AR* towards zero. The *AR* of the delisted firms will equal zero (from the delisting month to the end of the tested period) contrary to the alternative treatment of removing the returns completely. Therefore, the possibility of false acceptance of the null hypothesis (of zero *AR*) would be higher (type I error).

3.4.4. Equal or value weighted AR

Although the model selection is difficult, someone should also consider its configuration. It seems that when the benchmark portfolio or index is equally-weighted, problems are more severe especially for small stocks (Fama, 1998; Brav and Gompers, 1997; Brav et al., 2000). Specifically, when small firms are equally weighted with larger ones, small stocks have greater weight than they ought to, which makes the portfolio more sensitive to new listing and rebalancing biases

(Barber and Lyon, 1997). They are also more sensitive to the delisting bias (Shumway and Warther, 1999). Therefore, the models yield misspecificed test statistics as the empirical rejection rates exceed the theoretical ones (type I errors; see also Barber and Lyon, 1997, p.342).

Contrary, the number of firms included in the portfolio does not affect its return when the portfolio is value-weighted (it is thus less sensitive to rebalancing and survivorship biases). However, value-weighted benchmarks could have higher return variances in periods with large weights of a single firm (because its systematic risk is not weighted). This would result in higher errors (*AR*) but low t-statistics. For this reason Loughran and Ritter (2000) suggest that equal-weighting might be more appropriate. Nonetheless, probably the biggest advantage with value-weighting is that, the bad-model problem is less susceptible. That is because small stocks that are the most susceptible to the bad model problem have smaller weight when the portfolio is value-weighted. Thus, if the event sample mainly consists of small firms, value weighting mitigates the bad-model problem (Boehme and Sorescu, 2002).

3.4.5. Cross-sectional and time-series dependence

As event firms follow a specific corporate event, their returns are likely to be cross-sectional correlated, especially when they share the same event period. In addition, when firms are subject to the same event more than once within the tested period, their *AR* are overlapping. In fact, this might be the most severe form of cross-sectional dependence in *AR* (Lyon et al., 1999). The lack of independence generates misspecified test statistics, as the traditional test-statistics assumes independence and normality in the *AR* distributions. For that reason, studies such as Loughran and Ritter (1995) and Spiess and Afflek-Graves (1995) require sample firms to participate only once at the SEO event for the 5-year period tested. Noticeable, not only corporate events, but randomly selected samples are also subject to return overlapping (Brav, 1997). Random firms are usually selected with replacement, which implies that the same firm might be used multiple times and/or participate into the same industry. This is important as several methodological papers use randomly

selected samples aiming to improve the statistical properties of long-horizon *AR* (Kothari and Warner, 1997; Barber and Lyon, 1997; Lyon et al., 1999).

However, *CTAR* approach avoids the overlapping problem since the returns are calculated in calendar-time rather than event-time (Brav, 2000; Ritter and Welch, 2002). The literature acknowledges that *CTAR* approach eliminates the cross-sectional dependence problem among sample firms because returns are averaged into a single portfolio each month. Thus, the *CTAR* method yields more robust test statistics in non-random samples (Mitchell and Stafford, 2000). It however remains more sensitive to the bad model problem. Lyon et al. (1999, p.197) give two possible reasons of why *CTAR* approach is more sensitive to the bad-model problem even when both approaches (*BHAR* and *CTAR*) are based on the size, BTM and maybe momentum factors. First, the FF-3 factor model (or any other asset pricing model) assumes linearity between the factors (i.e. market premium, SMB, HML) which seems unlikely to hold for the SMB and HML factors. Second, the model assumes the factors are independent which seems to be violated especially for small firms.

In addition, due to the estimation of cumulative or buy-and-hold returns, any errors and/or miss-estimations in the event-period will shift over time. Even when no returns are reported, *AR* are carried through the following months. This might inflate the reported *AR*. Cumulative (or buy-and-hold) returns will have spurious upward drift bias: because cumulating (or multiplying) short-term returns to long periods bias is mitigated (Cornad and Kaul, 1993). This creates the drift which could be economically large for long-horizon *AR*. The problem is less severe with *CAR* approach, as the periodical *AR* are aggregate and not multiplied with themselves.

Supporters of the *BHAR* such as Ikenberry et al (1995) and Lyon et al. (1999) suggest that careful portfolio formation (controls for new listing and rebalancing bias) and data availability can mitigate the cross-sectional dependence problem when estimating the test-statistics. They suggest bootstrap approaches (details on bootstrap approaches and the relevant argumentation are provided in section 3.5.2).

3.4.6. Normality assumption

The traditional statistical techniques that measure the significance of *AR* are based upon the normality assumption of the Central Limit Theorem (CLT). That is, the return distributions are assumed to be independently and identically distributed (iid).

Nonetheless, the normality assumption for long-term *AR* has proved not to hold. *AR* distributions are significantly skewed to the right (e.g. Mitchell and Stafford, 2000; Korthari and Warner, 1997; Barber and Lyon, 1997). As *AR* are right skewed, they follow the Student t-distribution, which is asymmetric with a mean smaller than the zero. Additionally, skewness is also related to the model used. As reference portfolios/market indexes are subject to rebalancing and new listing biases, combinations of the biases lead to increased misspecifications. Barber and Lyon (1997) argue that in *CAR*, rebalancing and skewness lead to negative bias in t-statistic (especially when returns are equally weighted).

Contrary, the new listing bias causes positive mean bias (or less negative) in *AR* due to the IPO underperformance. In *BHAR*, the negative bias of rebalancing offsets the new listing, causing negative bias in the t-statistic (Barber and Lyon, 1997). It seems that *BHAR* indicate more obvious problems of skewness and cross-sectional dependence (due to the compounding which is likely to inflate the reported returns), however less susceptible to the bad-model problem (as reference portfolios or single matching firms are used).

These violate the normality assumption of the residuals, suggesting misspecifications on their statistical inference. Thus, the use of traditional parametric t-tests may indicate abnormal performance when none is present. This reduces the t-test reliability (Type I error).

3.5. Tests for statistical inference in relation to the known biases and normality assumption

3.5.1. Parametric tests

Assuming normality, the traditional parametric test-statistic has a null hypothesis of zero average *AR* and is measured as:

$$t-test=\frac{\overline{AR}_{j,t}}{\sigma(AR_{jt})/\sqrt{n}} \qquad \text{Eq. 3:8}$$

where $\overline{AR}_{j,t}$ is the average AR of the event firms j, over the months t. $\sigma(AR_{j,t})$ is the cross-sectional standard deviation (n represents the observations). Depending on the approach used, $\overline{AR}_{j,t}$ could be *CAR, BHAR* or *CTAR*. The traditional t-test (Eq. 3:8) assumes that *AR* are time-series and cross-sectional independent (it also assumes that securities have the same $\sigma(AR_{j,t})$). However, the (auto and/or cross-sectional) dependence of *AR* often violates the assumption of being identically and independently distributed (iid).

To address this issue, time-series statistics are frequently used by employing variations of Fama-MacBeth approach (Fama and MacBeth, 1973). Such approaches adjust for autocorrelation in standard error coefficient and, also control for factors such as size and BTM (see Table 3.1 for references and application frequency).

More specifically, Dichev and Piotroski (2001) estimate the long-run abnormal performance following bond ratings. They use both, simple statistical tests and variations of Fama-MacBeth approach for formal investigation of potential inflation in test-statistics due to dependence, as follows. Cross-section regressions are run for each calendar month tested in their sample, controlling for size, BTM and a dummy variable that captures upwards or downwards bond rating changes (which is their event). Loughran and Ritter (1995) also run monthly cross-sectional regressions over the FF-3factor. The rationale of using a pricing model is that, by forming portfolios the cross-section dependence is eliminated (but power might be sacrificed and be correlated with omitted factors; see also section 3.4.5 for *CTAR* dependence).

In sequence, the monthly cross-section coefficient of interest is used to estimate a corrected test-statistic. The t-statistics equals the average periodical coefficient divided by the standard error of the time-series of periodical coefficients.

$$t_{Fama-MacBeth}=\frac{mean(coefficien\ t)}{\sigma(cefficient)} \qquad \text{Eq. 3:9}$$

Hence, the t-statistics of this approach is immune of cross-section dependence on *AR* (dependence does not affect the un-biasness of the coefficients, as they rely on time-series independence for statistical testing).

Finally, it is supported that *CTAR* eliminate the cross-sectional dependence because the returns over the periods are aggregated into a single portfolio, yielding more robust test statistics in non-random samples. As all cross-correlations of the event-firm *AR* are automatically accounted for in the portfolio variance, the distribution of the *AR* is closer to the normal distribution. Therefore, the distribution allows for classical statistical inference (Mitchell and Stafford, 2000).

3.5.2. Non-parametric tests

Recall that *BHAR* indicate more obvious problems of skewness and cross-sectional dependence in comparison with *CTAR*. However, they are less susceptible to the bad-model problem (see section 3.4.6). Ikenberry et al. (1995) examine share repurchases and support that the biases in *BHAR* can be avoided with careful benchmark portfolio formation (that control for cross-sectional dependence, new listing and rebalancing biases) and bootstrapping procedures (that address the skewness problem) similar to Brock et al. (1992).

Bootstrapping is a straight-forward procedure. It is argued that it can solve the problems of t-statistics that assume normality and time-dependence. It derives from the simulation of an empirical null distribution of *AR* that corrects the normality assumption. Initially, a pseudo-portfolio is created by replacing randomly with replacement each event-firm with a non-event firm within the same reference portfolio (e.g. size and BTM portfolios). This procedure is repeated several times to get a large number of matching returns for each event-firm. Then, the *BHAR* of the pseudo-samples is estimated in the same manner as the actual one. This creates a pseudo-distribution of *AR*. If the difference between the average pseudo and real *AR*

is significantly different from zero, the null hypothesis of no *AR* is rejected.[15] Ikenberry et al. (1995) do not document serious dependence problems.

In the same spirit, Lyon et al. (1999) estimate an empirical p-value which derives from a bootstrap approach. They propose a bootstrapped version of a skewness-adjusted t-statistic to eliminate the sample misspecification:

$$t_{sa} = \sqrt{n}(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6n}\hat{\gamma}) \qquad \text{Eq. 3:10}$$

where $S = \frac{\overline{AR}_{j,t}}{\sigma(AR_{j,t})}$ and $\overline{AR}_{j,t}$ is the mean *AR* for at the time *t*. $\sigma(AR_{j,t})$ is the variance of *AR*. $\hat{\gamma}$ is an estimation of the coefficient of skewness that equals $\gamma = \frac{\sum_{j=1}^{n}(AR_{j,t} - \overline{AR}_{j,t})^3}{n\sigma(AR_{j,t})^3}$. The null hypothesis of the skweness adjusted t-test is zero *AR* (zero difference in the event and empirical average *AR*). The skewness adjusted t-test can be applied to the event sample, as well as the bootstrapped *AR*. Lyon et al. (1999) suggest that only the bootstrapped version of the skewness adjusted t-test yields well-specified test statistics.[16]

Both, Ikenberry et al. (1995) and Lyon et al. (1999) advocate that *BHAR* approach can avoid the skewness bias with careful benchmark portfolio formation. They also advocate that the normality assumption can be corrected with the use of non-parametric bootstrapping procedure. Hence, as nonparametric tests are assumed to release long-term *AR* from the CLT assumptions and control for the new listing and rebalancing biases, bootstrap procedures seem promising to long-term event study methods. They can also be used for both, *BHAR* and *CAR*. On that basis, *BHAR* and single non-event firm approach would probably be the most appropriate method to compute corporate abnormal performance (less econometric problems and the bad-

[15] Ikenbery et al. (1995) sort all NYSE and AMEX firms into deciles based on their size (market value at the end of each April). the annual return of each event company is compared with the average return of the size portfolio it belongs. Each of the 10 size portfolios is then ranked on quintiles on the same date, resulting to 50 size and BTM portfolios. Each event-firm is replaced by a non-event firm within its corresponding portfolio. The procedure is repeated 1000 times, to create 1000 pseudo-portfolios. Each pseudo firm is compared with the reference portfolio return, calculating pseudo-*AR*. The distribution of 1000 pseudo-*AR* is treated as the "expected" abnormal performance. The null hypothesis is zero difference between the pseudo and the real *AR*.

[16] For further details on bootstrap procedures see bootstrap methodological papers such as Hall and Horowitz (1996); Horowitz (1996; 1998); Efron and Tibshirani (1993).

model problem is less obvious). Thus, various scholars follow *BHAR* and the Lyon et al. (1999) bootstrap approach (see Table 3.1).

Nevertheless, arguments against the assumption of *BHAR* being iid following bootstrapping exist. Although normality can be approached with bootstrapping, the independence assumption is severely overstated. That is because most corporate events are not random (Mitchell and Stafford, 2000). This constitutes one of the main drawbacks of the methodological papers that use random samples (e.g. Lyon et al., 1999; Barber and Lyon, 1997; Kothari and Warner, 1997). The traditional t-test of significance for simulated random event-firms *AR* is frequently misspecified.[17]

If the two samples (event and empirical) have systematically different residual variations, the new empirical distribution will be biased (Brav, 2000). In other words, if the event-sample is cross-correlated but the empirical distribution is not, the resulting inferences might be mistaken. This is because the bootstrap approach assumes that observations are cross-sectionally uncorrelated, which is likely to be violated for non-random samples (Jegadeesh and Karcski, 2004). This problem makes the above methods applicable to random events that are uncorrelated across firms, rather than non-random.

Brav (2000) attempts to provide more accurate predictions, by employing a Bayesian predictive approach. He uses IPO samples and argues that it 'relaxes' the assumption of independence in certain circumstances. Contrary to previous models that simulate based on the size and BTM characteristics, he chooses the pseudo-distribution based on their *BHAR*. The *AR* are estimated following a characteristics-based model such as Daniel and Titman (1997) (any model can be used). Thus, the randomly chosen pseudo-portfolios should have similar dimensions with the event-firms. The *AR* of each firm are measured in time-series manner but the model parameters are estimated for the sample firms as indicated by the *CTAR* approach to avoid dependence. It is suggested that this approach overcomes the normality assumption and problems of cross-sectional correlation of long-term *AR*. He advocates for *CTAR* approach.

[17] Barber and Lyon (1997) and Kothari and Warner (1997) attempt to address the biases in long-horizon *AR* studies (*CAR* and *BHAR*). They document different statistical techniques for each benchmark used, different biases and different performance evaluation. Barber and Lyon (1997) advocate for *BHAR* approach, whereas Kothari and Warner (1997) for *CAR*.

In addition, Mitchell and Stafford (2000) oppose the frequent claim that bootstrap procedure solves all dependence problems: the normality assumption is valid with bootstrap (becomes more plausible with big samples) but the independence is not (it increases with sample size). The problem of bootstrap procedures is the benchmark formation which overstates the tests statistics and not the independence assumption (Loughran and Ritter, 2000; Mitchell and Stafford, 2000). After controlling for dependence and heteroskedasticity,[18] Mitchell and Stafford (2000) advocate that the calendar-time portfolio has more power to identify reliable evidence of *AR*.

More specifically, they estimate *CTAR* as advocated by Fama (1998) and decompose the intercept to the expected abnormal performance (given the FF-3factor model and the sample composition) and second to the unexpected abnormal performance (attributable to factors such as the event, industry clusters, specific investor strategies or any other factor that the model cannot capture). The expected *AR* is estimated by composing an empirical distribution via bootstrapping: they run 1000 calendar-time portfolio regressions of random samples chosen to participate into the same portfolios as the event (size and BTM). The average intercept of the pseudo-*AR* constitute the expected *AR* ($\hat{a}_0$). An 'adjusted intercept' or unexpected intercept is the difference between the event ($\hat{a}$) and pseudo-mean intercept ($\hat{a}_0$). Hence, they estimate a new t-statistic by dividing the adjusted intercept with the event distribution standard error $\hat{s}$.

$$t = \frac{\hat{a} - \hat{a}_0}{\hat{s}} \qquad \text{Eq. 3:11}$$

Interestingly, Mitchell and Stafford (2000) advocate that the *CTAR* automatically accounts for the portfolio variance as the calendar portfolios eliminate the cross-sectional dependence of event *AR*. Therefore, the distribution is closer to the normal distribution which allows for classical statistical inference. Several subsequent articles follow this approach (see Table 3.1).

Jegadeesh and Karceski (2009) also focus on the main problems of non-random samples. They attempt to correct any potential biases of *AR* dependence ignored by

[18] A common correction of heteroskedasticity for equally-weighted portfolios is to standardize the *CTAR* by the calendar-time portfolio variance (see Franks et al., 1991). Mitchell and Stafford (2000) use general nonparametric bootstrapping procedure (following Horowitz, 1996).

the Lyon et al. (1999) approach. As Lyon et al. (1999) do not account for the fact that non-random samples might be concentrated in specific industries and/or to specific periods (Mitchell and Stafford, 2000), cross-sectional dependence and autocorrelation is not eliminated. Jegadeesh and Karceski (2009) propose an auto- and serial-correlation t-test that generate White (1980) corrected estimations and allows for non-zero serial covariance (generalized version of Hansen and Hodrick, 1980) which is applicable for non-random samples, samples with industry clustering and overlapping returns. Nevertheless, they acknowledge a drawback of their approach. Their suggested t-test is less powerful in comparison with the conventional t-statistic in non-random samples. That is, its rejection rate is lower than that of the conventional t-test, e.g. while the conventional t-test would reject the null of no *AR* when a three-year *AR* is 44.8%, their serial correlation consistent t-statistics will reject the null at 38.5%. Hence, it increases the possibilities for a Type I error.[19]

3.6. Selection of the appropriate approach for valid inferences

3.6.1. Robustness tests

Having explained the problems of long-run event studies, an attempt to provide some practical indications for valid inferences would be helpful. When the objective of a research project is not to expand the extant literature but to test the long-run *AR* following a corporate event, the application of the two main competing methodologies (*BHAR* and *CTAR*) is assumed to provide reasonable valid inferences. In line with this, Mitchell and Stafford (2000, p.302) argue that 'the best way to check the robustness of the results is to repeat the analysis with a different model of expected returns and a different methodology'. Indeed, having a careful look at Table 3.1, the majority of the papers apply more than one long-run event study for robust findings. In addition, most recent studies report not only conventional t-tests, but also (skewness) adjusted t-tests, based on bootstrapped standard errors.

[19] Further discussion on the econometrics of event-studies can be found in Kothari and Warner (2007).

3.6.2. Nature of the dataset, market of interest, testable hypothesis

3.6.2.1. Nature of dataset and market of interest

An appropriate approach of long-run *AR* computation should focus on the nature of the data and the market of interest. Let us assume that a research project addresses a question related to a small market. An example could be the Greek market which is considered to be a developed (FTSE, 2009) but only with about 330 listed companies. On this market, it is impossible to construct a big number of size and BTM portfolios as the researcher will face data availability problems. The firm numbers consisting of each constructed portfolio will be very few, with a result to draw invalid estimations. Therefore, simple control matching approach would probably be the most obvious applicable method.

CTAR would also be applicable (if at least 10 firms can be included in each calendar portfolio, to avoid heavy heteroskedasticity problems). Nevertheless, more caution is needed. The model would be more reliable when specific market conditions are taken into account when constructing the risk factors. If for instance the 70% of the market capitalization fall within the three lowest size deciles, constructing the factors similar to the original FF-3factor model would not capture the size effect of the specific market. The same holds for the BTM or momentum factors. As an example, Boechme and Sorescu (2002) state that the nine smallest deciles comprise only the 12% of the total US market value. However, these firms are the ones that document the dividend anomaly. Hence, adjustments to the portfolio breakpoints might be necessary for valid estimations.

In contrast, if the study refers to a more 'global' portfolio (e.g. the European portfolio) rather than being country specific, there is scope for examining sub-samples based on each local market. More specifically, under the assumption of one efficient and integrated international market, Fama and French (1998) suggest a world three-factor model (that explains international stock returns better than an international *CAPM).* The factors are constructed similar to the original FF-3factor, however they consist of international stocks weighted by country-specific market value components. They are also weighted with domestic-factors. Thus, the model accounts for the different impact of the foreign and domestic factors. Liew and

Vassalou (2000) examine this world-factor model, documenting high ability to estimate expected returns in various international markets.

However, Griffin (2002) examines the predictive ability of the model having estimated world and domestic factors. After comparing the coefficients he advocates that working on international index provides less reliable results than country specific. He argues that the choice between of a domestic or global model may substantially affect the expected return estimation. 'Using the wrong model can lead to errors in capital budgeting, portfolio evaluation and risk analysis decisions' (ibid, p.783). Domestic (market specific) model should be preferable. A domestic model choice would also avoid problems of country specific components, controls for institutional settings, investor protection levels, etc. Of course, such controls might be unavoidable if the $A\overline{R}$ is used as an (in)dependent variable for a broader research question e.g. about the European portfolio (see below).

3.6.2.2. Testable hypothesis

- *The event*

In addition to prior decision, the testable hypothesis determines the model of expected performance. Let us assume now that a research project measures the abnormal performance surrounding an event that affects the total market population, e.g. the adoption of International Financial Reporting Standards (IFRS) in Europe at the 1st of January, 2005. This event affects the universe of European listed firms. Thus, any benchmark would be subject to the event. Loughran (2000), Jegadeesh (2000) suggest excluding the event firms from control portfolios. In such case, single matching firm approach would not be applicable. The intuition behind single-control benchmarks is to match each event firm with a firm that is *not* subject to the event.

With the use of an asset-pricing model and/or portfolio approach, the constructed portfolios are also affected by the event. However, with the inclusion of a binary variable that captures the time that the particular event takes place (before and after), the model can distinguish whether the AR experience a change after the event in firm and/or portfolio level. At the same time, the coefficients of the relevant interaction

terms might document changes in the risk loadings after the particular event. With the use of simple reference portfolios the pre- and post-event periods can also be distinguishable in calendar-time. Hence, these approaches can capture the effect of the event for a specific firm.

➢ *AR time-horizon*

The time interval of *AR* is also an important issue. Let us assume that all firms in the sample have the same event time (e.g. the IFRS adoption) and the time horizon is one year. In such case, *CTAR* in its traditional form (Fama, 1998) would not make sense because all event firms will participate to the same monthly calendar portfolios and only 12 monthly observations will be available for the time-series regression.

Nevertheless, running 12 cross-section monthly regression models and use the mean intercept coefficient should provide valid inferences in terms of the magnitude of the *AR*. In addition, time-series regressions over an asset-pricing model for each individual event firm should also provide reliable results. A mean cross-sectional intercept will reflect the *AR* (Boechme and Sorescu, 2002; Loughran and Ritter, 1995). Reference portfolios would also provide valid inferences (as well as matched-firms if the event does not involve the total market population).

➢ *Relation to accounting measures*

Finally, if the research objective of the study is associated with accounting items, it is scope for the *AR* to correspond to the fiscal year of the corporation. Note that accounting items are published on a quarterly basis. Thus, *AR* outside this fiscal period would not be affected by the accounting information. For this reason, *AR* need to be adjusted accordingly. If possible, estimation of the *AR* with a lag of four months (or more) after the fiscal year end date of each firm would provide adequate time to the market to incorporate the new information of the financial statements into the market prices (Barth et al., 2008; Francis et al., 2004). Thus, *AR* would be comparable (in terms of timing) with the corresponding accounting amounts of the event firm and, be able to capture the impact of the accounting information.

Likewise, Teoh et al. (1998a, b) and Iqbal et al. (2009) that examine the long-run performance around SEO and IPO in relation to earnings management estimate FF-3factor adjusted *BHAR* and *CAR* to examine the long-run firm performance around the events. However, they use market-adjusted *AR* as at four months after the fiscal year end or the event month (whichever is later) when the long-run *AR* are compared with accounting items. They run the market-adjusted *AR* over the accounting items, whilst they control for the size and *BTM* effects in a firm level at the right-hand side of the equation (also adjusted for the firm fiscal year end). Other 'accounting' studies use simple market-adjusted *AR* and adjust only for size (e.g. Chaney and Lewis, 1998), whereas others do not control for other risk factors beyond the market premium at all (e.g. Yoon and Miller, 2002).

The separate control has its intuition to return overlapping. Estimating annual *AR* that corresponds to the fiscal year of each firm in the benchmark portfolio would lead to return overlapping (each benchmark firm is likely to have its fiscal year end at different periods). Also, the portfolio construction represents calendar returns, rebalanced always at the same month even if the fiscal year end dates of the firms vary. Thus, the return for a calendar month cannot be adjusted for FYE in aggregate level. For that reason, it is common to use market-adjusted returns. However, controlling for the size and BTM effects at the right hand side of the equation, assumes linearity with the *AR*.

3.6.3. Improving the ability of the model to capture the cross-section variation of expected returns

Most recent studies follow the Fama and French (1992, 1993) model, assuming that size and BTM can describe the cross-section variation of expected returns regardless of the implications of the known bad-model problem. Note that three out of the twenty-five portfolios in Fama and French (1992) provide significant *AR*. This suggests that the model fails to predict the expected returns accurately (for the particular portfolios) by default. The problem could become more severe when the firms participate into a specific event that is driven by factors unrelated to size and BTM and the model cannot capture. Hence, the documented *AR* include not only

post-event performance effects but also a certain level of models' inability to capture the expected returns (combined effects).

Lyon et al. (1999) concludes that scholars could identify other characteristics with which they can match event returns such as recent return performance, recent quarterly earnings surprises, price/earnings ratios and perhaps others. 'Descriptive analysis should provide insights regarding the important dimensions on which researchers should develop a performance benchmark' (ibid, p.198). Indeed, Ahern (2008) draw non-random simulated data and test event-study methods when the samples share similar characteristics such as size, prior returns, BTM, earnings-to-price ratios. Beyond the market, FF-3factor and Carhar-4factor models, he also uses a characteristics-based model. He reports the lowest biased returns and least standard errors when the benchmark has similar characteristics as the event one. Although his findings refer to short-event windows, they again underline that *AR* estimations could be improved with more careful benchmark techniques.

On that basis, scholars appear more willing to experiment with the sample constructions, matching procedures and statistical tests beyond the traditional portfolio formations, bootstrapping and/or momentum factors. Deviations from the 'traditional' models are applied. For example, Brav et al. (2005) use actual return expectations, extracted from Value Line (rather than measure the expected returns by assessing the realized ones following the event).[20] The authors state smaller standard error compared to the studies that use realized returns, whilst overlapping problems and autocorrelation are less susceptible.

Boechme and Sorescu (2002) follow the suggestion of Mitchell and Stafford (2000) and estimate expected and adjusted *CTAR*. However, instead of simulating an empirical distribution they match each event-firm with a single non-event firm with similar size and pre-event momentum. With this, they capture any firm-level momentum (contrary to the aggregate momentum of the Carhart-4factor model).

[20] Value Line is an independent research with no affiliation to investment banking activity. Hence, Brav et al. (2005, p.34) argue that analysts optimism bias (Rajan and Servaers, 1997) or conflict of interest bias (Michael and Womack, 1999) are less likely to affect its expected return estimates. Value Line expectations cover the 90% of the US market and are highly correlated with the market expectations. It also has long time series of historical expected returns.

They thus distinguish between expected and unexpected *AR* based on the assumption (or suspicion) that the asset-pricing model cannot capture firm specific pre-event momentum that is likely to occur prior the event. Such controls would be helpful when evidence suggests timing strategies for a particular event, e.g. IPO and SEO (see Loughran and Ritter, 1995 and Lee, 1997 respectively).

Likewise, Eckbo et al. (2000) advocate that liquidity risk is reduced after the SEO event, due to the de-leverage effect of SEO. This is not observed by the corresponding benchmark firms, which creates misspecifications to the estimated intercepts. They apply a six-factor multifactor model which expands the FF-3factor model to include macroeconomic factors. They report sensitivity of *AR* to the method used and, scope for improvements. Similar findings are reported by Eckbo and Norli (2005) for IPO firms.

Of great importance is also a parallel set of literature that grows and provides evidence on asset pricing models based on the market model and stock (il)liquidity, rather than the size and BTM factors. It is generally well documented by the literature that liquidity risk affects the stock returns, in time-series manner. For instance, Liu (2006) compares a liquidity-adjusted two-factor pricing model with the CAPM and the FF-3factor model, reporting higher ability to predict returns. He advocates that his illiquidity factor captures the cross-section variation of expected returns that the BTM fails to. Various other studies also create (il)liquidity factors in relation to expected returns. Pastor and Stambaugh (2003) suggest a liquidity factor that account for momentum liquidity strategy profits which can predict *AR*. Amihud (2002) and Acharya and Pedersen (2005) suggest that illiquidity premium partly drives the expected *AR* and/or affect the asset prices. Datar et al. (1998) argue that liquidity is a significant factor in explaining the cross-section variation in expected returns. Campbell et al. (1993) also report negative correlation between trading volume and returns. These are few published papers of the pertinent literature, published to leading finance journals.[21]

[21] See also Holmstrom and Tirole (2001); Hasbrouck and Seppi (2001); Chordia et al. (2001); Lo et al. (2004); Gallmeyer et al. (2004); Chordia et al. (2008); Bekaert et al. (2007) among others.

This study refers to them as liquidity-adjusted models. As it is advocated that liquidity-adjusted models have high ability to forecast stock returns, a question of why not to estimate *AR* based on these models and/or other liquidity factors is raised. These models are generally accepted and can (at least partly) explain the *AR*. Given the bad-model problems and the sensitivity of long-horizon *AR* to the model of specification, liquidity-adjusted approaches could be complementary and provide robust results. As a conclusion, the road for further research is open.

3.7. Operational / Accounting performance

As various studies with different research objectives estimate not only stock but also accounting performance (e.g. Hertzel et al., 2002; Loughran and Ritter, 1997; Teoh et al., 1998b; Abarbanell and Bushee, 1997; 1998; Piotroski, 2000; Ou and Penman, 1989; Stober, 1992; Lev and Thiagarajan, 1993; Piotroski, 2000; see more in Kothari, 2001), the impact of the corporate event on the accounting data is valuable. This section describes the methods and power of operating abnormal performance.

Fama and French (1995) document that earnings and stock returns are driven by the same factors, i.e. market premium, size and BTM. Returns and/or earnings of glamour firms (low BTM) are mean reverted and, small firms tent to mean-revert more quickly than large firms with similar risk factors. Thus, operating performance is subject to the bad problem in the same manner as stock performance. Not only methodological papers but also empirical studies confirm the earnings reversal. For instance, Loughran and Ritter (1997) attempt to link the stock and operating abnormal performance of SEO firms and report positive stock and operating performance prior the event which reverses afterwards. When the transitory nature of the operating performance becomes apparent, the stocks underperform.

Similar to stock approaches, the identification of accounting abnormal performance requires the use of an appropriate benchmark, i.e. an expected performance model to ensure that the estimated abnormal earnings are not manifestation of the mean reversion documented by the literature. However, in the case of operating performance, no asset-pricing model (or variation) is applicable, as the market

models examine stock returns and not accounting earnings. In addition, accounting items cannot be available on daily basis as the market returns.

3.7.1. Models of expected performance – the appropriate benchmark

The models of expected operating performance are simpler in comparison with stock *AR*. They are restricted to comparisons between event and non-event earnings measures (controls based on specific risk factors). A simplistic approach mentioned by Brown and Warner (1985) estimates the expected operating performance of the event-firm *j* at year *t*, $E(P_{j,t})$ being equal its past performance P_{jt-1}:

$$E(P_{j,t}) = P_{j,t-1} \qquad \text{Eq. 3:12}$$

Significant differences between them imply abnormal performance. However, this model ignores the performance of any benchmark. It is less reliable and the tests statistics are not be well specified. Alternatively, the expected performance of the event-firm *j*, $E(P_{j,t})$ equals the performance of an appropriate benchmark *i*, $P_{i,t}$. The changes in operating performance between the event and benchmark company over the same period of time are also comparable:

$$E(P_{j,t}) = P_{i,t} \text{ or } \Delta(E(P_{j,t})) = \Delta(P_{i,t}) \qquad \text{Eq. 3:13}$$

Brown and Warner (1985) use another model, which defines the expected performance of the event-firm $E(P_{j,t})$ as the lag of its own performance $P_{j,t-1}$ plus the change in the benchmark performance $\Delta(P_{i,t})$:

$$E(R_{j,t}) = P_{j,t-1} + \Delta(P_{i,t}) \qquad \text{Eq. 3:14}$$

Appropriate benchmarks used by previous studies are either single control non-event companies or constructed portfolios that consist of companies with similar risk characteristics (size, growth and/or industry). The use of industry averages is in fact a very common approach (e.g. Teoh et al., 1998; Iqbal et al., 2009; Loughran and Ritter, 1997; Hertzel et al., 2002; Bethel et al., 1998; McLaughlin et al., 1996). Barber and Lyon (1996) evaluate the power of operational event-studies and suggest

that single-control firm matching approach is the most powerful approach to detect abnormal operating performance, especially in relation with the firms' own past performance (Eq. 3:14). Risk factors used are based on accounting measures such as the book value of assets and earnings growth for size and performance (contrary to market value and return performance that stock event-studies use).

3.7.2. Measures of operating performance

The use of several accounting items that measure operating performance such as return on assets (the most common), return on sales and return on market value of assets are common in the literature. The use of other measures includes among others the return-on-equity, Tobin's Q, profit margins, market-to-book and earnings per share.[22] It is important to point that beyond operating measures, the use of cash-based performance is also acceptable (e.g. cash-flow return on assets and return on cash-adjusted assets). Cash-based performance is less powerful than earnings-based, as cash-flows are driven by activities such as increase in capital, financial loans, sale of fixed assets or other. These activities do not reflect firm performance. Hence, the definition of 'cash-flows' might change the results (e.g. operating cash flows vs. total cash flows at the end of a fiscal year).

However, cash-based measures might sometimes be more appropriate, because of the sample characteristics. For example, in an IPO or SEO, the management might have incentives to manipulate operating items to report higher performance in their attempt to achieve better offer price and placing characteristics (e.g. Teoh et al., 1998a; 1998b; Aharony et al., 2000; Roosenboom et al., 2003; Rangan, 1998; Shivakumar, 2000). In such case, the reported operating income would be inflated, concealing the firm real financial situation. Typically, the management might benefit by manipulating earnings (and other common accounting risk factors) and thus, the reported earnings might be misspecified.

[22] See Healy and Palepu (1990), Barber and Lyon (1996), Loughran and Ritter (1997), Hertzel et al. (2002), Bethel et al. (1998), Megginson et al. (1994), Jain and Kini (1994), Hanson and Song (2000), and others.

Barber and Lyon (1996) suggest that matching only with the industry or size solves the problem of earnings manipulation but unfortunately, it ignores the performance history of the firm relative to the benchmark lag-performance. Matching with past-performance and size probably captures the cross-variation better. However, book value of assets reflects the cost of all assets, not only the operating ones. This could understate the true productivity of operating assets. Although the problems are recognizable, they do not seem to deter the use of measuring operating performance by the accounting literature.

3.7.3. Tests of statistical inference

To evaluate the statistical inference of the operating performance, traditional t-statistics are argued to be well specified only if event-firms are matched by control firms with similar pre-event performance (Barber and Lyon, 1996). Nonparametric Wilcoxon sign-rank tests are uniformly more powerful than parametric ones, due to extreme accounting observations that might misspecify the tests. It is typical by studies investing abnormal operating performance to report median results along nonparametric tests of statistical significance (e.g. Wilcoxon test).[23] However, test statistics are likely to be misspecified if the benchmark is subject to rebalancing over time. Benchmark rebalancing would erode the power of the statistic reference. More powerful estimations can be achieved with constant benchmark. Hence, single-control matching is probably more appropriate. In summary, operating assets are good indicators for operating performance. Operational performance is not subject to the debate of the long-run event studies and it is well specified, regardless the biases.

3.8. Summary and conclusions

This chapter describes the debate about the research design of long-run event studies. Although the event-study methodology is not new (e.g. MacKinlay (1997) refers to Dolley (1933) as possibly to be the first article that applies an event-study), long-run abnormal performance methods are relatively recent and require extra caution as they

[23] See Loughran and Ritter (1997); Healy and Palepu (1990); McLaughlin et al. (1996); Jain and Kini (1996); Patrch and Shah (1997), DeAngelo (1988); Kaplan (1989) and others. They all report medians.

face several problems. This raises the need for proper understanding of the extant literature, which is the main objective of this chapter. It attempts to describe the most significant issues discussed by the relevant literature and focuses mainly on the recent methodological and practical concerns.

BHAR and *CTAR* long-horizon *AR* approaches compete each other, while the traditional asset-pricing model used to identify mispricing (Fama and French, 1993) over-estimates the average returns during the sampling period mainly for small, low BTM securities (the bad-model problem). In fact, no *AR* estimation method is free of the bad-model problem (Fama, 1998). Consistently, Mitchell and Stafford (2000) suggest that one third of their sample long-run *AR* is manifestation of the model deficiencies rather than due to the event. Brav and Gompers (1997) imply that event anomalies are due to misspecifications of the pricing model. Various other papers including Lyon et al. (1999), Ritter and Welch (2000), Gompers and Lerner (2003) also seem to be consistent with this view. This issue raises the question of whether the estimated *AR* derive from the corporate event, misspecifications of the pricing model, or combine effects of the event and model misspecifications.

Several methodological papers advocate for one or another approach and attempt to reduce as much as possible the known biases (e.g. Ikenberry et al., 1995; Barber and Lyon, 1997; Kothari and Warner, 1997; Lyon et al., 1999; Mitchell and Stafford, 2000; Loughran and Ritter, 2000). In short, *CTAR* are more sensitive to the bad-model problem contrary to *BHAR* that have more severe econometric problems. Thus, extreme caution is needed in conducting long-horizon event studies (Kothari and Warner, 1997).

This study suggests ways of how a scholar can choose among the alternative methods based on the nature of the dataset that a research project might have, on the market of interest, on the hypothesis tested. As a conclusion, each approach should be considered as complementary rather than competing to other methods. In addition, as the literature has failed to provide a single model against which robust *AR* can be measured, it creates a setting for new methodological approaches or diversions form the existing ones.

Such methods could be benchmark choices based on pre-event characteristics (Lyon et al., 1999), adjustments of the event returns for pre-event momentum strategies (Beochme and Sorescu, 2002), inclusion of macro-economic factors to a pricing model (Eckbo et al., 2000) and/or other. The road for further research is open. On that basis, this study builds upon prior studies and suggests that adjusting for liquidity (e.g. Liu, 2006; Pastor and Stambaugh; 2003; Amihud, 2002; Acharya and Pedersen, 2005; Datar et al., 1998) might facilitate the extant literature in providing more valid inferences in long-horizon *AR*.

Finally, the chapter describes the power of the operating abnormal performance approaches. Although abnormal earnings are subject to the bad-model problem (Barber and Lyon, 1996), they are not subject to the big debate of stock performance. Contrary, are easy to implement. The models of expected performance are relatively straightforward and traditional statistical tests can be applied. Their major flaw is perhaps the fact that their power could be misleading as it can be subject to managerial discretion.

Table 3.1: Long-horizon abnormal performance applications

This table indicates studies conducted long-horizon event-studies. It is restricted to a relatively small number of studies, in comparison to the universe of articles estimating long-run *AR*. It presents their methodology employed, their corporate event, methodology and tests of statistical inference. *ew* stands for equal-weighted and *vw* for value-weighted. *CTAR* represents calendar-time *AR*. *CAR* and *BHAR* is for cumulative and buy-and-hold *AR*, respectively.

Authors	Corporate Event Studied	Performance Measure	Benchmark / AR calculation method / Other controls	Tests of statistical inference
Wruck and Wu (2009)	Private placements, US	Stock	1. Traditional market model (NASDAQ, CRSP) / CAR / vw	1. traditional t-statictic
Barclay, Holderness, Sheehan (2007)	Private placements, US	Stock	1. Market model-(daily, CRSP) / CAR / ew	1. traditional t-statistic 2. nonparametric Wilcoxon rank test
Ngatuni, Capstaff, Marshall (2007)	Rights and Open Offers, UK	Stock	1. Matching firms (size, size + industry, size + BTM) / BHAR	1. traditional t-statistic 2. z-test (for the negative BHAR) 3. Wilcoxon test
Armitage (2007)	Right Issues, UK	Stock	1. Matching firms (size, size+industry, size+BTM) / BHAR	1. traditional t-statistic 2. Non-parametric Wilcoxon paired test
Peyer and Vermaelen (2005)	Private repurchases	Stock	1. FF-3factor model / CAR, CTAR / vw	1.t-test (use of time-series variation of portfolio AR)
Krishnamurthy, Spindt, Subramaniam, Woidtke (2005)	Private Placings, US (NYSE, AMEX,NASDAQ)	Stock	1. Index (around the announcement) / CAR / ew 2. Matching firms (size, BTM, size+BTM, size+BTM+placement choice) / long term BHAR 3. FF-3factor model / CTAR 4. Carhart-4factor model / CTAR	1. Wilcoxon test 2. traditional t-statistic 3. z-statistic
Ho (2005)	Rights Issue and Placings, UK	Stock	1. Matching firms (size + industry, BTM+industry, size+BTM) / BHAR 2. FF-3factor model (LSPD) / CTAR / ew & vw 3. Carhart-4factor model / CTAR/ ew & vw	1. traditional t-statistic 2. skewness-adjusted t statistic (Lyon et al., 1999)
Burton, Helliar and Power (2004)	SEO, UK	Stock	1.Matching firms (size, size+industry, size+BTM) / BHAR, WR 2. Reference portfolios (size quintiles) / BHAR	1.traditional t-statistic 2. nonparametric Wilcoxon test 3. z-test and binomial test
Byun and Rozeff (2003)	Stock splits, US	Stock	1. Reference portfolios (size+BTM) / BHAR, CAR / ew & vw 2. FF-3factor / CTAR / ew & vw 3. Carhart-4factor / CTAR / ew & vw	1. bootstrapped skweness adjusted t-statistic: Ikenberry et al. (1996) & Lyon et al. (1999)

Gompers and Lerner (2003)	IPO, US	Stock	1. Index (CRSP) / CAR, BHAR , CTAR / vw 2. Reference portfolios (size, BTM, ew & vw) / event time BHAR , CAR, CTAR {when BHAR or CAR delisted R treatment: 1) zero returns for sample-benchmark and 2) split the benchmark returns over time} 3. CAPM / CTAR 4. FF-3factor / CTAR	1. skewness adjusted t-statistic (Lyon et al., 1999)
Ritter and Welch (2002)	IPO, US	Stock	1. Index model (CRSP) / BHAR / vw 2. Matching firms (size + BTM) / BHAR 3. FF-3factor / CTAR	1. simulated t-statistics
Boehme and Sorescu (2002)	Dividends, US	Stock	1. FF-3factor / CTAR / ew & vw, OLS & WLS 2. Adjusted FF-3factor (using a single firm matching) / CTAR 3. FF-3factor / CAR / comparisons with the control matches as well	1. bootstrapped skweness adjusted t-statistic (Lyon et al., 1999)
Eberhart and Siddique (2002)	SEO, US	Stock & Bond	1. Matching firms (Lee, 1997 for stock) / BHAR / ew & vw 2. Reference portfolios (Lyon et al., 1999 for bond) / BHAR-event returns 3. Median comparisons of raw bond vs. raw stock returns 4. FF-3factor / CTAR (for stock) 5. 6factor bond model (Elton et al., 1995) / CTAR	1. t-statistic (Lee, 1997 for stock) 2. Bootstrapped skewness-adjusted t-statistic (Lyon et al., 1999 for bonds) 3. Returns and factors are standardized by the monthly (cross-sectional) standard deviations – for CTAR
Hertzel, Lemmon, Linck, Rees (2002)	Private placements, US	Stock and Operating	1. Matching firms (MV, industry + MV, BTM+MV at the t=-1) / BHAR 2. FF-3factor / CTAR, BHAR 3. CAR: match by Operating Income and Industry (following Loughran and Ritter, 1997) / ratio comparisons	1. traditional t-statistic 2. nonparametric bootstrap procedure
Dichev and Piotroski (2001)	Bond ratings changes, US	Stock	1. Reference portfolios – 25 (5x5quinilies, CRSP vw) size+BTM: CAR, BHAR (with monthly rebalancing)	1. traditional t-statistics 2. variations of Fama-MacBeth approach (similar to Loughran and Ritter, 1995)
Eckbo, Masulis Norli (2000)	Seasoned + debt issues, US	Stock	1. Matching firms: size+BTM (NYSE/Amex/Nasdaq – FF portfolios): BHAR e.w 2. 6-Factor model including macroeconomic factors	1. t-statistics on student-t distribution

Mitchell and Stafford (2000)	Mergers, SEO, Share repurchases (US)	Stock	1. Reference portfolios / BHAR / ew & vw, monthly rebalancing 2. Reference portfolios / CTAR / ew & vw 3. FF-3factor model / CTAR / ew & vw	1. nonparametric bootstrap procedure 2. corrected t-statistic 3. time series on standardized *CTAR* t-statistic
Brav, Geczy, Gompers (2000)	IPO and SEO, US	Stock	1. Indexes / BHAR, CAR, WR / ew & vw 2. Reference portfolios (5x5 size+BTM, 4x4x4 size+BTM+price momentum (Carhart, 1997)) / BHAR, CAR, WR 3. FF 3factor model / CTAR 4. Carhart (1997) 4factor model / CTAR	1. bootstrapped t-statistics
Brav (2000)	IPO, US	Stock	1. FF-3factor model / CTAR	1. nonparametric bootstrap procedure (Baeysian approach)
Loughran and Ritter (2000)	New issues + simulated data, US	Stock	1. Reference portfolios / BHAR / ew & vw 2. FF-3factor / CTAR / ew & vw	1. t-statistic using White (1980) corrected coefficients
Jegadeesh (2000)	SEO, US	Stock	1. Indexes / BHAR / ew & vw 2. Reference portfolios (size, size decile+BTM, size decile+E/P, size decile+$Returns_{(lag6)}$, size decile+$Returns_{(lag36)}$) / BHAR 3. Reference portfolios (size+BTM puintiles) / BHAR, WR / calendar month BHAR 4. FF-3factor model 5. Carhart-4factor model	1. test statistic extending Hansen and Hodrick (1980) intuition that each sample observation is not necessarily equally weighted (page 13) 2. t-statistic for 3&4 factor models 3. F-statistic testing the hypothesis of jointly equal AR between "size" sub-samples
Bethel, Liebeskind, Opler (1998)	US Private placements	Operating (ROA, BTM)	1. Industry non-event firms	1. Wilcoxon test {ROA and BTM as dependent variables for their logid regressions (event vs. nonevent)}
Teoh, Welch, Wong (1998a)	SEO, US	Stock Operating	1. Market model, FF-3factor model / BHAR (annual benchmark rebalancing) 2. ROA, CFA	1. White-t test 2. Traditional t-test, Wilcoxon (for operating)
Kothari and Warner (1997)	Simulated random events, US	Stock	1. Market model / CAR, BHAR 2. Index model / CAR, BHAR 3. CAPM / CAR, BHAR 4. FF-3factor model / CAR, BHAR	1. traditional t-statistic 2. Non-parametric Wilcoxon tests 3. Non-parametric Bootstrap procedures

Brav and Gompers (1997)	IPO, US venture and non-venture companies	Stock	1. Index models (3 index) / BHAR, WR / ew & vw 2. Size and BTM portfolios; BHAR, WR / ew & vw 3. FF industry portfolio / BHAR, WR / ew & vw	1. traditional t-statistics
Loughran and Ritter (1997)	SEO, US	Stock and Operating	1. Market models (CRS)) / CAR / vw, 1year average annual geometric (compounded), average annual arithmetic 2. Matching firms ((operating perf/Assets)+Industry); ratio comparisons and changes (ROA, M/B, (CapEx+R&D)/Assets), Profit Margin)	1. Wilcoxon non-parametric test 2. traditional t-statistic
Barber and Lyon (1997)	Simulated, US	Stock	1. Reference portfolios (10 Size, 50 size & BTM, 10 BTM) / BHAR 2. Matching firms firms (size, BTM, size+BTM) / BHAR 3. FF-3factor model (CRSP) / CTAR / ew {NYSE, AMEX,NASDAQ}	1. cross-sectional standard t-statistic 2. non-parametric Wilcoxon signed-rank test statistic (support that time-series standard deviations to calculate test statistics cannot be used for BHAR. For CAR, it worsens the new listing bias)
Barber and Lyon (1996)	Simulated, US	Operating (ROA, Profit Margin, BTM, Income/Asset)	1. Single firm control (Assets + Industry) / operating performance 2. Index control: ratio comparison, Δratios, lag performance, lag+benchmark Δratios	1. traditional test-statictic 2. Wicoxon signed-rank tests
Sudarsanam (1996)	Takeovers, UK	Stock	1. Market Model (FTSALL) / CAR / ew daily R 2. Size quintile portfolios / BHAR / ew	1. t-statistics (Brown and Warner, 1985; and Afshar et al., 1992)
McLaughlin, Safieddine, Vasudevan (1996)	SEO, US	Operating	1. Industry adjusted: Operating cash-flow/Assets, Tobins'q	1. two-tailed sign test
Spiess and Affleck-Graves (1995)	SEO, US	Stock	1. Reference size portfolio (CRSP-NYSE/AMEX/NASDAQ) / BHAR 2. Matching firms approach (Size+ndustry, Size+BTM) / BHAR 3. Market Index (CRSP) / BHAR / control firms are also matched with the indexes	1. traditional t-statictic
Loughran and Ritter (1995)	IPO and SEO, US	Stock	1. Matching firms (size matched) / BHAR, WR / ew, rebalancing every 12months 2. Market Indexes / BHAR, WR / vw 3. FF-3factor model, WR / vw	1. traditional t-statistic 2. time-series & cross-sectional statistics based on Fama-MacBeth approach (controls for size+BTM)

Ikenberry, Lakonishik and Vernaelen (1995)	Share repurchases, US (NYSE and ASE firms)	Stock	1. Index (CRSP and Compustat) / CAR, BHAR / ew & vw Reference portfolios: size, size+BTM (10 size decile x 5 sizeBTM quintiles (NYSE and ASE) / CAR, BHAR	1. t-statistic of autocorrelation in daily errors and standardize monthly CAR 2. nonparametric bootstrap procedure
Levis (1995)	IPO and SEO, UK	Stock	1. Index Model (FTA, HGSC) / CAR / ew 2. Reference portfolios-BHAR: size, size+ind., size+BTM deciles	1. time-series adjusted t-statistic
Jain and Kini (1994)	IPO, US	Operating	1. Industry portfolio / Δratio comparisons (ROA, CF/Ass., M/B, EPS,P/E, Sales, CapEx)	1. nonparametric Wilcoxon singed rank test
Megginson et al. (1994)	Privatized firms, international data	Operating & Financial	1. International industry comparisons; Δratio comparisons (ROA, Sales, NI, CapEx, Assets, Leverage, Div)	1. Wilcoxon sum rank test
Barclay and Holderness (1991)	Private placements, US	Stock	1. Market model-(daily CRSP) / CAR / ew	1. traditional t-statistic 2. singed – rank test
Ritter (1991)	IPO, US	Stock	1. Index models (NASDAQ, NYSE) / CAR, BHAR, WR / ew & vw (monthly portf. rebalancing) 2. Matching firms firms (size & industry) / CAR, BHAR, WR	1. traditional t-statistic 2. time adjusted series t-statistic

Chapter 4 : The Determinants of the Discount or Premium in Non pre-emptive Equity Placements

4.1. Introduction

This chapter focuses on the factors affecting the discount or premium of the two UK non pre-emptive equity placements used in this study (primary and secondary placements). It investigates the first research objective of the study *(Obj.1)* and provides answer to the first research question Q1. Hence, it examines whether the offered discount of the two samples reflects certification, monitoring and/or liquidity costs. It treats premiums as a special case, investigating whether they arise because the buyer receive private benefits.

The chapter is organised as follows. Section 4.2 explains its motivation and contributions. Section 4.3 describes the existing evidence on theories about equity offering discounts and develops the testable hypotheses. Section 4.4 describes the methodology and research design. It defines the control variables and predictions on the testable hypotheses. Section 4.5 explains the sample collection process and sample characteristics. Section 4.6 analyzes the empirical findings and the last section 4.7 concludes.

4.2. Motivation and main contributions of the chapter

Typically, SEO are offered at a discount to the prevailing market price of the day prior to the announcement. This holds for different issue types and various countries.[24] Conflicting explanations for the discount provided by the US literature, argue that the discount is necessary as investors need to be compensated for investing

[24] Inter alia see for US findings Hansen (1988), Loderer et al. (1991), Wruck (1989), Eckbo and Masulis (1992; 2007), Hertzel and Smith (1993), Corwin (2003), Altinkilic and Hansen (2003; 2007), Gao and Ritter (2008). For the UK see Armitage (2000; 2002; 2007; 2010), Korteweg and Renneboog (2002), Slovin et al. (2000), Barnes and Walker (2006), Balachandran et al. (2009). For Greece see Tsangarakis (1996), for the Netherlands (Kabir and Roosenboom, 2003; De Jong and Veld, 2001), for Japan (Kang and Stulz, 1996). See section 2.3.3 for details about the SEO type involved in each study.

into a relatively overvalued stock (Eckbo and Masulis, 1992), for covering expenses due to high trading costs of new shares with inelastic demand (Hess and Frost, 1982; Loderer et al., 1991; Corwin, 2003) and for undertaking uncertainty risks related to the issuer value (Altinkilic and Hansen, 2003). Other evidence suggests that the discount derives from manipulating activities of investors that wish to profitably cover their short-positions, by manipulating the market price downwards (Kim and Shin, 2004; Sarrieddine and Wilhem, 1996; Gerard and Nanda, 1993).

While the above explanations refer to SEO in general, studies referring specifically to firms conducting private placements suggest that they are subject to higher asymmetric information in comparison with those conducting public offers (Wu, 2004; Chemmanur and Fulghieri, 1999). For that reason, the discounts in private placings reflect investigation expenses. They are attributed to certification costs (Hertzel and Smith, 1993). Alternatively, they reflect agency costs such as monitoring (Wruck, 1989; Wruck and Wu, 2009) or entrenchment (Barclay et al., 2007). Moreover, US evidence advocates that transactions with existing shares are likely to be priced at a premium, as investors aim to extract private benefits (Barclay and Holderness, 1989), or to become active placeees (Barclay et al., 2007).

Nevertheless, the theories applicable for US SEO have not always been applicable into the UK (Korteweg and Renneboog, 2002; Slovin et al., 2000). Different settings result into different implications and market reactions. More specifically, an argument easy to criticize about its validity in the UK market is the manipulative short-selling. The relevant studies advocate that short-selling activities during the offer period can influence the underwriter decision to set deeper discount for US SEO. Such tests are not applicable in the UK market, simply because of the different discount setup procedures. Recall that in the US the offered price is defined immediately after the offer period, following a road-show and price negotiations. Thus, incentives to drive the market price down are plausible. The underwriter will consider the downward price path after the announcement as negative market reactions and, setting a larger discount will reduce the risk of the offer being unsuccessful.

However, in the UK, the offer price is set before the placing announcement and remains fixed during the whole offer period. Thus, as changes in market prices after the announcement day do not affect the discount, manipulating activities will not affect the discount either. The underwriter fee might be affected upwards as the manipulation is likely to jeopardise the success of the issue. However, the discount is a distinguishable cost from the underwriter fee in the UK (Armitage, 2000; 2002) (contrary to the US that the fee and discount are joined; see section 2.2.2.2).

Another issue that it is likely not to hold in the UK (although not tested by prior UK studies) is the monitoring argument (Wruck, 1989; Wruck and Wu, 2009). The reason again is the different settings in the UK. Mainly existing shareholders invest (Armitage, 2010) rather than new as the relevant US studies argue. Thus, costs of new investors to act as external monitor factors in the UK would be limited.

These differences provide a motivation to investigate deeper the offered price discount (or premium) of UK placements. In addition, the UK lacks evidence on the discount for transactions with existing shares, while evidence referred to private placement discounts is limited. Most UK studies that include private placements mainly use placings accompanied by a pre-emptive offer (Burton and Power, 2003; Armitage and Snell, 2004; Balachandran et al., 2009) and placements defined similar to the US firm commitment offers (Slovin et al., 2000; Barnes and Walker, 2006).[25] Armitage (2010) and Balachandran et al. (2009) report discount for private placements that are smaller than the discount of other UK SEO types. Nevertheless, they focus on the investor identity and flotation choices, respectively.

This study contributes by examining the certification and monitoring arguments related with the two non pre-emptive UK offering types tested. Furthermore, it deviates from prior studies by investigating the stock liquidity as an important driving factor of the offered discount in non pre-emptive offers. The motivation of this latter argument is twofold. While prior literature does recognize the importance of liquidity for US public and right offers (Kothare, 1997; Corwin, 2003; Altinkilic and Hansen, 2003), UK rights and open offers (Armitage, 2007; 2002), Canadian and US private placements with sale restrictions (Maynes and Pandes, 2008; Silber,

[25] See section 2.2.1.3 for further details.

1991), the liquidity impact on non-sale restricted placings is disregarded. Second, the discounts of private placings are reported to be larger than the corresponding certification and monitoring costs (Barclay et al., 2007), which implies that other economic factors are omitted. On that basis, the present study contributes by examining the liquidity impact on non-sale restricted stock in the UK market that has different settings, using private and secondary placements. It also investigates the premiums separately, which have had less attention by prior studies.

4.3. Hypotheses development and empirical predictions

4.3.1. Certification and value uncertainty as explanations for the discount

There is no doubt about the existence of a discount in SEO, however the literature provides conflicting interpretations for its need. A dominant explanation is that discounts reflect adverse selection problems. Consistent with the Myers and Majluf (1984) model, a firm will issue stock when the anticipated benefits of the proceeds are more than the anticipated increase in firm value from investing into a positive NPV project. Thus, investors interpret the new issue as a choice with adverse selection costs, suggesting that the new stock is relatively overvalued. Hence, equity issuing will mitigate overvaluation to the new shareholders, otherwise the management will choose not to issue. To overcome the 'winners curse problem' that informed investors will participate only in good issues, studies such as Rock (1985) and Beatty and Ritter (1986) suggest that under-pricing is necessary to compensate uninformed investors.

With regards to private placements, greater levels of information asymmetries between the firm and market are involved (Wu, 2004). US findings suggest the discount reflects costs incurred by the investors to acquire the necessary information and certify the stock (Hertzel and Smith, 1993). Hertzel and Smith (1993) report that undervalued firms choose private placement over public offerings or over foregoing the issue (expanding the Myers-Majluf model). Outside placees are to demand discount as compensation for their investigation costs to certify / assess firm value (Hertzel and Smith, 1993).

In line with the asymmetric information rationale, UK evidence suggests the SEO offering is associated with a certain level of risk that investors are exposed to which imposes the discount (see Korteweg and Renneboog, 2002; Armitage 2002). Hence, discounting is necessary and should be expected due to the market mechanism (investors need to be compensated for their costs). Altinkilic and Hansen (2003) decompose underpricing into expected and unexpected, arguing that expected discount reflects uncertainty and investors' expenses to assess firm value. Expected discount should be included into the stock prices. Unexpected components reflect placement (transaction) costs and information asymmetries, attributable to uncertainty about the issuer value.

On the one hand, considering the different settings of the UK market that suggest higher asymmetric information as well as higher risk (due to the lack of underwriter flexibility in setting the discount after a road show) the first hypothesis of this chapter tests the certification argument and the possibility that the discount is subject to investor uncertainty about the issuer value. On the other hand, as investors in the UK are mainly existing shareholders (Armitage, 2010), less asymmetric information costs should be needed. This hypothesis involves not only the private placements, but also the secondary offerings, as the information provided to the market is limited to a news report. However, since the stock is already listed, different implications are involved. To distinguish between the two samples, the hypothesis is set into 4.1a and 4.1b, referring to the primary and secondary placements, respectively.

H4.1: *The discount of (a) primary and (b) secondary placements reflects certification and/or uncertainty about the issuer value.*

To examine the first hypothesis, variables that reflect firm and offer characteristics are used (Hertzel and Smith, 1993; Altinkilic and Hansen, 2003). These include the firm age, value, past abnormal performance, return volatility and ownership concentration. Such characteristics reflect the level of asymmetric information between the firm and the market, in relation to the firm value.

4.3.2. Monitoring (or entrenchment) as explanation for the discount

A different view attributes discounts to agency and corporate governance problems (Wruck, 1989; Barclay et al., 2007; Wruck and Wu, 2009). Potential investors need to be assured that their funds are not to expropriated or wasted on unattractive projects. On that basis, it is argued that discounts are necessary to compensate investors for costs incurred to monitor the incumbents, in terms of participating into the decision making process and governance (Wruck and Wu, 2009).

Contrary, Barclay et al. (2007) document that only a small portion of the investors in their US private placements becomes publicly active, or conflict with the incumbents after the event. In fact, the discounts paid are significantly larger than the corresponding certification or monitoring expenses. This suggests that the discounts cannot reflect mainly certification or monitoring costs, arguing that discounts of private placings actually reflect entrenchment costs. Wu (2004) also reports evidence that mainly supports the entrenchment rather than monitoring.

With regards to the secondary offerings, investors appear to get involved with firm affairs (at least attempt to) after the placing (Barclay et al., 2001). Activity signs are also reported by other studies examining US secondary placements (Barclay and Holderness, 1991; Bethel et al., 1998; Allen and Philips, 2000). Moreover, the investors in secondary placements seem willing to pay more for the stock (Barclay et al., 2001). It is thus argued that active investors mainly participate into secondary placings and pay premium, whereas discounts of primary placings reflect managerial entrenchment.

Considering that investors participating into UK private placements are mainly existing rather than new (Armitage, 2010), as well as those participate into the secondary sample (see Appendix I), arguments referring to new investors acting as external monitor factors on placements (Wruck and Wu, 2009; Krishnamurthy et al., 2005; Slovin et al., 2000; Allen and Philips, 2000) are expected to have less impact into the UK. As prior UK studies have not directly examined the above possibilities, the second hypothesis examines the monitoring argument. As above, the hypothesis is set into 4.2a and 4.2b to distinguish between the two offering types.

H4.2: *The discount of (a) primary and (b) secondary placements paid by active investors reflects monitoring.*

The monitoring hypothesis predicts significant activity signs after the event or at least signs that indicate efforts of the new investors to get involved with the management and affect firm policies. Significant changes in ownership concentration, changes in top management around the event, as well as potential investor incentives to be 'strategic' are measures that provide indication on whether they intend to be active or not. The identity of investor (e.g. activist, corporation, institution) might also have impact on monitoring the incumbents. If the monitoring hypothesis is valid, significant positive relationship between post-purchase activity and the offered discount is expected.

Although this study does not directly examine for entrenchment, it allows for it since entrenchment and monitoring are mutually exclusive. While lack of monitoring does not necessarily mean entrenchment (entrenchment suggests that passive investors require discount to *support* the incumbent management), the study offers 'food for thought' on whether entrenchment might valid in the UK.

4.3.3. Inelastic demand and liquidity costs as explanation for the discount

An issue that has attracted less attention in the private placement literature is the (il)liquidity of SEO stocks. Liquidity is defined as the ability of the stock to be traded cheaply and with little deviation in market prices (caused by new information). If the stock is seen as illiquid, the cost of trade and the relevant risk for investors are higher. Thus, they will be willing to take large positions on illiquid stocks only if they are compensated with discount (Loderer et al., 1991; Barclay and Litzenberger, 1988). Evidence on equity issues suggests that the stock is illiquid with a downward sloping demand curve (Allen and Postlewaite 1984; Korajczyk et al., 1990; Loberer et al., 1991). This means inelastic stock demand and high cost of trade (Corwin, 2003; Kalay et al., 2004; Armitage, 2007).

US evidence on public offers supports this explanation (Barclay and Litzenberger, 1988; Loderer et al., 1991). Corwin (2003) reports that underpricing is more

pronounced for stocks with inelastic demand and high stock uncertainty. Altinkilic and Hansen (2003) argue the discount is expected due to information asymmetries, while unexpected discount reflects liquidity costs. Kothare (1997) report illiquidity for rights and bought deals. However the later are more liquid. Similar interpretation is provided by studies examining sale-restricted shares (e.g. Silber, 1991; Maynes and Pandes, 2008).[26] UK findings also comply with the illiquidity argument. Armitage (2007) suggests discounts of UK pre-renounced rights reflect liquidity costs and uncertainty about the issuer value, while Armitage (2002) documents higher liquidity costs for rights rather than open offers.

Nevertheless, the liquidity is disregarded with regards to the non-sale restricted private placements and secondary placements. This has profound implications since liquidity might also characterizes pure private placements, especially if we consider that discounts are larger than the corresponding certification and monitoring costs (Barclay et al., 2007, p. 479). Additionally, selling pressure can be observed not only when new shares are issued, but also when investors attempt to sell existing blocks of shares (Scholes, 1972). On that basis, the third hypothesis examines the relation between liquidity costs and discount, distinguished into 4.3a and 4.3b for each equity type.

H4.3: *The discount of (a) primary and (b) secondary placements reflects liquidity costs and/or compensation for price pressure due to inelastic demand.*

The liquidity hypothesis predicts that the distribution of the new shares cannot be absorbed by the market unless investors are compensated with discounts. Therefore, positive relationship between the relative offered size and the discount is expected. In addition, following the arguments of Loderer et al. (1991), if the demand curve is downward sloping, the relative offered size will be positively correlated to the discount: deeper discount implies deeper price pressure. The study additionally uses a number of other proxies for liquidity costs effects over the discount, such as the bid-ask spread, trading volume, volume turnover and the relative offered size, as well

[26] Articles examining the price techniques of IPO such as Rock (1985), Benveniste and Spindt (1989), Loughran and Ritter (2002) also suggest that liquidity is significant for SEO.

as the riskiness of the stock. The general prediction is, positive relationship between the discount and the level of illiquidity.

4.3.4. Buying at a premium

Considering that SEO discounting is necessary and expected by the market (Altinkilic and Hansen, 2003), paying premium sounds obscure. However, prior studies report that small percentages of their samples are priced at premium, e.g. 14% of the private placements in Barclay et al. (2007, p. 475). Hertzel and Smith (1993) document that about 36% of their sample pays a premium, which reflects control incentives as the investors are already insiders (ibid, 470). Similarly, Armitage (2010) reports large variations in the offered price including large discounts and premiums for the UK market.

This raises the question of what the investor incentives are in order to pay more than the market price, when the common practice is to require discount. The plausible explanation is extraction of private benefits of control (Barclay and Holderness, 1989). In fact, Wu and Wang (2005) expand the Myers and Majluf (1984) model by allowing for investments into projects with negative NPV, contrary to the original Myers-Majluf assumptions. Investing into negative NPV projects allows for self-dealing investor interests. It derives from agency costs that lead to overinvestment (not only to underinvestment as with the adverse selection problem of Myers-Majluf model). Thus, they introduce agency costs and private benefits. This assumes asymmetric information not only between the firm and the market, but also within the corporation. This is plausible, considering that investors are mainly existing shareholders.

Building upon this rationale, the fourth hypothesis examines the incentives of investors to have personal targets. This study argues that pursuing private benefits is not related to the placing type, primary or secondary. An investor who has self-dealing interests is not affected by how he/she will buy the shares, via the secondary market or directly from the firm. Such view is consistent with Wu (2004) who argues that the key to the placing discount/premium is related to factors other than the placing type. This study treats placements at a premium separately from discounts, as

only few placements are offered at premium (see section 4.6.1). Accordingly, the following hypotheses are tested.

H4.4a: *The premium reflects private benefits and it is irrelevant from the placing type (primary or secondary).*

A second case that is likely to involve personal goals exists when investors become votive with the management and improve firm value. Expectations for future value improvements due to their participation might make them willing to buy at premium. In such cases, the personal incentives of the investors are also beneficial for the shareholder wealth. In addition, when fewer discounts are required by active investors or for an illiquid stock with high uncertainty would also suggest self-dealing interests. This leads to the following hypothesis.

H4.4b: *Active investors aiming to improve future firm value will be willing to pay premium or accept lower discount, while benefits of any value enhancement are mitigated to all shareholders.*

In such case, monitor signs are to be positively related to premium. The premium will also be positively related to announcement market reactions.

4.4. Research design and methodological details

This section explains the variables used to examine the testable hypothesis. It starts with the discount/premium, which is the main interest of the chapter.

4.4.1. Discount/premium measures

The market price is the 'accessible' price for an individual investor that does not buy directly from the company. Thus, the relative premium is presented as percentage of the market price (negative premium represents discount):

$$premium = \frac{(pl.price - mkt.price_t)}{mkt.price_t} \qquad \text{Eq. 4:1}$$

The $pl.price$ is the offer price collected from the news reports or prospectuses; $mkt.price_t$ is the unadjusted market price at day t (DS item UP), $t=0$ is the

announcement day. The premium/discount is estimated over the market prices at days t=-1, t=+1 and t=+10. The market prices after the announcement should incorporate the placing information and thus, any significant premium/discount will reflect additional premium/discount driving factors. The different day discounts also take into account the placing post-offer effects as well as control for the possibility that the market delays to incorporate the placing information.

Additionally, when new shares are issued at a price different than the market one, the market price is expected to adjust accordingly. Precisely, assuming the firm value remains constant and there is no information effect, offering additional stock at a price different than the market one, the subsequent market price is expected to equal the weighted average value between the two prices (or the theoretical ex-right price as commonly known; e.g. Armitage, 2007). As an example, consider a stock with 100 shares outstanding and market price at the day prior the announcement equal to t_{-1}=10. If the firm issue additional 100 shares with offer price t_{offer}=5, then the market price following the announcement should be 7.5 $\left(\frac{100*10+100*5}{(100+100)}=\frac{10+5}{2}\right)$. Thus, the market price will experience a mechanical dilution, which does not reduces the firm value. Based on the example, the real discount the investor gets is 2.5 (10-7.5) and not 5. Ignoring this market mechanism, a consideration of a discount of 5, biases the discount upwards. The study adjusts for this mechanical effect on market prices. The correct or adjusted market price the day after the announcement $P_{Adj,t=+1}$ should be:

$$P_{Adj,t=+1}=\frac{Old_{exist}\,shares * mkt.price_{,t-1}+New_{pl}\,shares * pl.price}{Old_{exist}\,shares+New_{pl}\,shares} \qquad \text{Eq. 4:2}$$

$Old_{exist}shares$ is the number of the existing shares outstanding, $mkt.price_{t-1}$ the market price the day prior the announcement, $New_{pl}shares$ the number of the placing shares and $pl.price$ the placing (offer) price. $P_{Adj.t=+1}$ should represent the price that a new investor could buy from the market *after* the placing, assuming no change in the equity value. If the market price the day following the announcement differs from the adjusted one, it can be interpreted as information effect. Similar arguments are discussed by Corwin (2003) and Altinkilic and Hansen (2003). As this mechanism might have significant impact on the price premium or discount, investors would require compensation for the price dilution. For the primary sample that new shares

are issued, the analysis is applied following both, the raw discount (Eq.4:1) and the price adjusted (Eq.4:2).

Further controls are taken. Few firms state at the prospectus that they plan to reorganize, to proceed with price adjustments and/or warrants are attached to the new share issue. Four cases involve share consolidations. To control for this, the market price at the day prior the announcement is adjusted to express the value reduction by multiplying it with the number of old shares consolidated into one new $mkt.price_{t-1} * n_{consol.shares}$.

Finally, most prospectuses state that the new shares '*rank pari passu*' in all aspects with the existing ordinary shares and will rank in full for dividends or other distributions hereafter. If the dividend entitlement is not waived or not mentioned at all, it is assumed that the placing shares are entitled to the same rights as the existing issued capital. (If investors were not entitled to dividends, this could affect the discount as their expected cash-flows will be lower).

4.4.2. Variable definitions and empirical predictions on the testable hypotheses

To explore the testable hypotheses, variables that capture the existing and changes in asymmetric information (*H1*), agency (*H2* & *H4*) and liquidity (*H3*) are used. The analysis involves each of the samples (primary and secondary).

4.4.2.1. Certification and uncertainty (H1)

The certification hypothesis is examined with the use of variables that measure the uncertainty about the issuer value and certification costs for which investors might require compensation. Five variables test the first hypothesis, as follows.

1. Age: The firm age is used as proxy for asymmetric information, measured as the years since the company listing. An older company has more information available to the public over the years, which suggests fewer information costs for an investor to certify its value (see Wu, 2004). Thus, negative relation to price discount is expected.

2. *F.Value*: The firm value. Firm value (or size) is a proxy for asymmetric information. It results from multiplying the market price with the shares outstanding. Similar to the firm age, the bigger the placing company the more disclosed and thus, easier for potential investors to get information and certify its value. Thus, negative relation to the discount is expected. Following common practice, it is measured as the natural logarithm of the firm market value (providing normality), $F.Value = \ln(MV)$. The average MV over the three month around the placing announcement for the secondary sample is used. For the primary sample the enlarge MV is used which includes the placing proceeds (MV over the 3-months after the offer).

3. $AR_{pre-offer}$: The past abnormal performance of the firm. It measures the firm ability to perform well and thus, to be priced accordingly. Over-performing firms are expected to be priced at lower discount, as it implies better firm quality. Thus, negative relationship to the price discount. At the same time, the proxy captures the possibility that the firm times the offer when it is overvalued or when the stock over-performs (Hertzel et al., 2002). In such case, the relation between $AR_{pre-offer}$ and discount will be positive. This assumes that the market realizes the over-valuation and requires higher discount.

Stock abnormal return $(AR_{pre\text{-}offer})$ is defined as the buy-and-hold *AR* for the months (-12,-1) prior the announcement day. Each of the placing firm is matched with a non-placing company based on its size and industry. From the population of UK listed firms (excluding firms within the financial services sectors) the firm with the closest MV, restricted to firms within the same industry sector (NIMD2) is chosen as benchmark.[27] For the primary sample, the enlarged MV is used (similar to Loughran and Ritter, 1995).

4. *Volatility*: The volatility of abnormal stock performance prior the event is a proxy for stock value uncertainty (Altinkilic and Hansen, 2003; Corwin, 2003). It indicates

[27] A second non-event firm is chosen, based on the closest book-to-market ratio and size restriction of MV ±30% between the two firms. Book-to-market is the book value of equity (equity capital and reserves minus total intangibles) divided by the market value as at the fiscal year end prior the event (Liu et al., 1999). The past-performance on this benchmark does not alter the conclusions.

the magnitude of pre-offer returns. A risk-averse investor would require higher compensation for a stock with higher volatility. Hence, it predicts positive relationship between the volatility and discount. Volatility is defined as the standard deviation of the monthly abnormal return, for the months (-36, -1) prior the event.

5. *Concentration* : The ownership concentration is a proxy for information asymmetry. A highly concentrated firm is less transparent for an outsider and thus, it is more difficult to assess its value, if the investor aims to be active. This raises the cost to invest and thereby, a new investor would need to be compensated with deeper discounts (corresponding to the additional expenses). It is thus expected to have positive relationship to the placing discount.

As ownership characteristics are not always accessible, researchers use the most appropriate available data. As an example, Wruck (1989), Hertzel and Smith (1993), Kothare (1997) use the sum of the beneficial shareholder portions that own equal to or more than 5% of the share capital. Wruck (1989) states that the results on ownership concentration are qualitatively similar when the five largest shareholder portions are sum up regardless of the stake of the individual larger shareholders. This study aggregates the portions (as a percentage of the total capital) of the six largest beneficial holders before the placing.

4.4.2.2. Monitoring the incumbents (H2)

Monitoring is addressed with the examination of significant changes in ownership after the offers, post-purchase activities and investor identity. Due to the findings that in the UK investors are mainly existing shareholders (Armitage, 2010), the corresponding hypothesis is likely to have minimum weight on the discount. Relevant descriptive statistics on whether activity signs are observed are presented in Table 4.3 and Table 4.4. For multivariate analysis purposes, three proxies are used.

1. *Δconcentr* : The changes in ownership concentration before and after the offer (similar to Wruck, 1989). The intuition of this proxy is as follows. It is more difficult for an outside investor to affect firm policies and governance, when the firm is highly concentrated. Hereby, the change in ownership concentration captures changes in the

'bargaining' power of the shareholders after the placing. This might help an investor to be active, regardless of being new or existing. It therefore captures the possibility that a new or existing investor might have bought a large stake to gain control or gain more power among the shareholders. The discount should reflect the present value of the monitoring expenses. Hence, the more the monitoring expenses, the more the discount they require. Contrary, significant negative coefficient will suggests private benefits; it implies the willingness of an investor to accept less discount to get the power to affect the firm policies.

2. $\Delta concentr^{*} D_{mgt\_turn}$: This is an interaction term between the $\Delta concentr$ and a binary variable D_{mgt_turn} that takes one for changes in management due to the placing. It takes zero otherwise. This proxy complies with more recent literature (Barclay et al., 2007; Krishnamurthy et al., 2005) that the post-placing activity beyond the changes in ownership concentration, plays important role in monitoring or entrenching the incumbents. Shareholder activity indicates the intention of investors to become active, in terms of gain a place among the directors. Hereby, abnormal managerial turnovers for the ±4 months around the event are assessed. Significant findings would imply pre-placement agreements between the firm and the placing investors. In a similar vein, Hertzel and Smith (1993) use interactions between their monitoring proxies and "$\Delta concentr$ *dummy*" and "*Single investor dummy*".

The relation with the discount is expected to be positive, as active investors will incur costs to monitor the incumbents (Wruck, 1989), especially if the firm is highly concentrated. Changes in the ownership structure but no changes in the management composition would imply entrenchment; passive investors would require discount to support the incumbent management (Barclay et al., 2007). Hence insignificant coefficient will be reported. If the proxy documents negative coefficient, it will suggest intention to extract private benefits; investors will seem willing to accept less discount for their involvement to the management, as predicted by H4.b.

In addition, to describe whether significant changes in management take place around the events, the managerial turnover (change in the number of directors over

the total number of directors)[28] is measured over a long period of ±3 years around the announcement, for each placement. Annual changes over this six year period are used as a benchmark, as being the expected (or normal) changes. Then, the managerial turnovers over the eight month period (±4) around the announcement are estimated and compared with the benchmark turnover. Significant differences between them are reported as abnormal (see descriptive statistics in Table 4.3).

3. *Str.Inv*: Strategic investor. This is a binary variable that takes 1 when the investor is classified as strategic. It takes zero otherwise. Strategic investor is the one who buys the whole or substantial portion of the placing (20%) but it is not an institutional investor. It could be large existing shareholder, insider, director or other affiliated investor. It could also be a subscriber for such percentage of the placing necessary to maintain his/her stake undiluted or, such percentage with result to be characterized by the LSE authorities as 'related party'. The placing might also be relatively small but significant for the investor wealth to provide him/her with bargaining power, to affect firm policies. A positive coefficient would imply monitoring costs [while negative would imply private benefits]. Table 4.4 describes the identity of the investors and portions of the discount paid.

4.4.2.3. Liquidity and inelastic demand (H3)

The impact of liquidity costs and risks on the offered discount is examined in multivariate analysis with the use of five variables as follows.

1. *TrVolm*: The trading volume reflects the quantity dimension of liquidity. Large historical trading volume indicates stock liquidity. A largely traded stock is easier to sell without big fluctuations in the market price. The turnover is thus expected to be negatively associated with the price discount. Similar to Corwin (2003), it is defined as the natural logarithm of the mean daily volume within a window of (-250, -1) trading days prior the announcement (DS item VO). Opposite sign should imply inelastic demand (see also Gao and Ritter, 2010).

[28] Directors are considered to be both, executive and non-executive directors (including chairman, CEO, CFO, COO, production managers or other managers reported as executives).

2. *%Volm*: The volume turnover reflects the speed dimension of liquidity. It captures the sensitivity of trading to changes in firm size. It is thus more related to the level of asymmetric information. Alike the trading volume, negative sign is expected. Following Wu (2004), *%Volm* is the trading volume as a percentage of the shares outstanding prior the event, within an average day window (-250, -1): $\%Volm = \frac{Volm_{j,t}}{Sh.Outst_{j,t}}$.

3. *Spread* : The bid-ask spread reflects the cost dimension of liquidity. If the stock is illiquid, the spread between bid and ask prices will be far from zero and, the opportunity to trade large amounts cheap will be limited. Less liquid stocks are more costly to trade. Thus, if the stock is seen as illiquid investors need to be compensated with larger discount (positive relation to the price discount is expected). Following Kothare (1997), the spread is defined as the difference between the ask and bid prices, divided by the did-ask midpoint price, over a window of 30 days prior the event: $Spread = \frac{Ask\,\mathrm{Price}_j - Bid\,\mathrm{Price}_j}{(Ask_t + Bid_t)/2}$.

4. *OffSize* : The relative offer size. It is the shares placed as a percentage of the shares outstanding (enlarged number for the primary sample), $OffSize = \frac{sh.Placed}{Sh.Outst}$. It represents the increase in shares relative to the shares outstanding, i.e. the increase in the stock supply (which is one component of the demand elasticity). A positive relation to the offered discount suggests the stock demand curve is downward sloping (Loderer et al., 1991). Hereby, it could be argued that the discount represents compensation for the subsequent pressure in the market price following the announcement due to inelastic stock demand (Barclay and Litzenberger, 1988; Corwin, 2003; Altinkilic and Hansen, 2003).

Positive relationship is also documented by Hertzel and Smith (1993) and Barclay et al. (2007) for US private placements. Hertzel and Smith (1993) interpret the positive coefficient as information costs of assessing the value of a larger block. Contrary, Barclay et al. (2007) consider the negative relationship between premium and offered size as insight for passive investors. Specifically, buying a larger block of shares

might lead investors to require larger discount, as the risk of mistakes in evaluating the stock due to asymmetric information will have greater impact on the shareholder wealth. Along similar lines, larger discount might be necessary to compensate a passive investor for buying a large portion to entrench the management. The possibility that the stock is illiquid and selling large amounts of the stock raises the actual cost and risk of trade (e.g. Corwin, 2003) is disregarded.

5. $OffSize * D_{HighSpread}$: In a manner similar to Corwin (2003) an interaction term between the $OffSize$ and a binary variable $D_{HighSpread}$ is used. $D_{HighSpread}$ takes 1 when the firm is in the highest quartile of bid-ask spread. As the placing size incorporates the effect of the offered quantity, when $D_{HighSpread}$ equals one implies the stock is among the riskiest in terms of liquidity risks/costs. The term should capture the price pressure effect due to inelastic demand and is expected to be positively related to price discount.

Note that the bid-ask spread and stock volume could also be considered as proxies for asymmetric information (e.g. Wu, 2004). The argument is that, the more the information about the stock, the less the risk and costs of trade. Thus, the more the stock liquidity. This fact makes information asymmetries significant for both hypotheses (certification and liquidity). However, they refer to different nature of costs. This study distinguishes between the two hypotheses by adding proxies for the quality of the stock and whether theses significantly affect the discount. The riskiness of stock in terms of value uncertainty is directly captured by the return volatility, while the firm quality is directly measured by the past abnormal performance. In addition, it is known that the relative offered size is a component of demand elasticity ($Elasticity = \frac{\Delta P / P}{\Delta Q / Q}$). By interacting it with the most illiquid stocks distinguishes between information and elasticity effects. In other words, examining a variety of measures and combining the arguments should facilitate in distinguishing between uncertainty about the issuer value and liquidity.

4.4.2.4. Buying at premium and private benefits (H4.4)

Barclay and Holderness (1989) argue that investors do not have any reason to pay more than the market price for a stock, unless they pursue private benefits of control. Hence, premium defined as the difference in the placing price and the prevailing market price *after* the event reflects private benefits (the market price should incorporate the information associated with the placing, after the event and thus, differences to the offer price should reflect private benefits). In such case, the above models are replicated using a premium sub-sample. The two equity offering types are distinguished with a binary variable that takes 1 for secondary placings and zero for the primary sample (*sample.dummy*). According to the hypothesis *H4.4a*, private benefits of control should not be affected by the issue type (primary or secondary). Thus, the *sample.dummy* is expected to be statistically insignificant. Additionally, *H4.4b* predicts that the relationships of the explanatory variables will be opposite than the predictions of hypotheses *H4.1, H4.2, H4.3*.

Overall, as the premium sub-sample is small, the study mainly focuses in understanding the implications around the placements priced at premium by providing relevant descriptive statistics such as classifying investors into categories based on their identity (which might imply incentives to pay more), the percentage bought, managerial turnovers and liquidity information.

4.5. Sample collection and characteristics

4.5.1. Sample collection

The study examines the implications around the two non pre-emptive UK equity placings that cover the period between 01/1998 – 06/2006. The choice for this period is twofold. First, prior evidence about primary placings refer to years 1996-1998 (see Barnes and Walker, 2006). Second, given the regulation changes in 1996, the study

investigates the post-deregulation period (allowing 2 years for adjustments), while it also covers the Companies Act 2000 issuing requirements.[29]

The first sample involves primary placings within the paradigm of SEO. New shares are issued but the existing shareholders do not maintain pre-emption rights to subscribe for the new shares on a pro-rata basis. Offers combined with pre-emptive offer are excluded (e.g. Right and Open Offers), as the study focuses on the implications of pure non pre-emptive offers that the evidence is sparse. To identify the private placings, a search through the news report of LexisNexis database was conducted, using the term 'placing' and reading line by line all the publicly announced placings over the period tested. US studies such as Wu (2004) and Wruck and Wu (2009) identify their samples using keywords such as 'private placement', 'private stock offering', 'private negotiated transactions', 'common stock sale privately', 'direct placement', 'private offering or sale' and 'Regulation D and/or S' which are regulations dealing the sale-restricted private placements in the US (there is no relevant regulation in the UK, although few placings sold to the US are sold under the regulation S or D). The search is replicated using the above keywords without successful sample increase.

If the placing is less than 5% of the company share and the report does not refer to pre-emptive rights, it is assumed that pre-emptive rights were waived in advance according to the Companies Act. 1996 (if not, a prospectus should be published). Such smaller placings might seem insignificant to the firm market value, however, they might have a great impact on the agency costs of the firm. A simple example is the placing of 2% of the share capital with an existing large blockholder. The 2% stake might raise his/her stake to a controlling part. Additionally, these small placings usually take place to very big companies, contrary to the traditional form of private placements over the 5% arbitrary cut-off point. Therefore, a 2% stake might create a selling pressure to the market.

[29] Recall that the 1996 Companies Act allowed UK listed firms to waive the pre-emptive rights for offerings more than 5% of their share capital and approve the placing 12 months in advance. Firms could exempt from the prospectus requirement for placings below the 5%. In sequence, the 2000 Companies Act 'relaxed' the size restriction of non pre-emptive offers, while the prospectus requirement relaxed further from 5% to 10% of the share capital (see section 2.2.1).

For the placings over the 5% of the shares outstanding, it is common practice for companies to publish a prospectus explaining the reasoning behind the private placing (prospectuses were extracted from Perfect Information). After reading the prospectus and the resolutions of the EGM, the placing is included into the sample if the pre-emptive rights of the existing shareholder are waived. To control for any differences of the two sub-samples (below and above the 5% cut-off point) the placings over 5% of the share capital are examined separately. Beyond the differences in the firm characteristics, the results in terms of the discount driving factors are similar. This makes the results robust.

The second offering type involves secondary placings. A block of existing shares is sold to the market or to specific investors. These placings are initiated not by the company but by one or more shareholders. The secondary placings are collected after reading the news reports of International Financial Review and confirmed by LexisNexis. Typically, a book building takes place and they are underwritten. Regardless the fact that the shares sold are already listed, the new investors pay the agreed placing price, not the market one.

The collection process resulted into 418 (primary and secondary) placements, by U.K. industrial firms. Investment companies, banks or companies that belong into financial industries are not included, as they are stocks with higher risk and betas. Share placings as a result of tender offers, mergers and acquisitions are not included into the samples (the transfer of an acquired firm shares to the acquirer is not considered as secondary placing). All placings are required to involve ordinary shares and, the relative offered size and placing price to be available or assessable from other sources. 55 placings are additionally excluded due to double counting of the placements. The double counting was due to the different data collection sources, as follows.

LexisNexis news reports are published the following day of the original announcement. Thus, for these placings, all announcement days had to be adjusted. In addition, the placings with prospectuses needed to verify the announcement day. Initially, the prospectus publication day was used. However, in rare cases the firm announced the forthcoming private placing few days earlier with a news report. The

first (informal) announcement day is used (by the time of the prospectus publication, the market might already adjust the firm price). To ensure this, the news report sequence for each placing with prospectus is followed, using as announcement day the day at which the placing is first reported. This procedure leads to the closest previous market price before the announcement.

A few US studies investigating public issues use the issue day as the event day. Others follow volume-based methodology to define/correct the issue day (e.g. Eckbo and Masulis, 1992; Safieddine and Wilhelm, 1996; Altinkilic and Hansen, 2003). The present study chooses the first news report day as the event day, as all information is released at the announcement, including the offer price. Thus, the market prices will incorporate the new information after the announcement day, contrary to the US, that the offer price is set immediately before the issue (not at the announcement). Besides, in many cases the issue or completion date is not reported, or the placements are already completed at the time of the announcement.

Second reason for possible double counting is that, in some cases companies announce placings that are to be allocated in more than one days (periodical offers). These cases usually involve few secondary offerings with book-building. A specific number of shares are to be sold and the initial characteristics are announced to the market. However, the whole procedure takes several days or the number/price of shares sold might change by the end of the placing procedure, due to the high or low demand. The news reports mention each placing in different day and cautious is needed to identify their relation in order to use the initial news report as the announcement day. Further, if the price or number of shares initially reported is different from the realized ones, the data are adjusted accordingly.

Finally, 10 additional placings are excluded due to lack of availability of market data in Datastream database (DS). The whole screening procedure leaves 230 primary and 123 secondary placements. Overall, as the UK market is smaller and more opaque in comparison to the US, the sample is relatively small compared US studies examining private placings such as Hertzel and Smith (1993), Wruck (1989), Hertzel et al. (2002), Barclay et al. (2007).

Table 4.1: Sample and placing characteristics

The table summarizes information about the sample and presents descriptive statistics for the placings. Gross proceeds represent the size of the placing in actual amounts, in millions of GBP (shares placed * placing price). MV is the firm market value, defined as the price multiplied by the shares outstanding (DataStream Item MV). For the primary placings the enlarged MV is used which includes the new issuance. Firm age is the years since the corporation listing. The gross proceeds as percentage of the firm market value reflects the placing value and the number of the shares placed as percentage of the enlarged share capital reflects the placing size. In some cases the placing size as percentage of the share capital is clearly stated in the prospectus or news report. However, in most of the placings is not. Thus, it is calculated as the ratio of the shares placed divided by the sum of the existing shares (plus the new share issue for the primary placings), $sharesPlaced/(exist.Ord.Shares + newShares)$. The denominator represents the enlarged share capital.

Panel A: Sample details

Period: 01/1998 - 06/2006	N
All placings	353
Firms involved	283
Followed by previous placings (21%)	70
Same day primary and secondary	11
Primary placings	230
Secondary placings	123

Panel B: Placing details

	Primary placings (N=230)					*Secondary placings (N=123)*				
	Mean	Median	St.Dev	Min.	Max.	Mean	Median	St.Dev	Min.	Max.
Firm MV (£millions)	1492	34	9748	0	138074	5324	814	22165	2	217682
Gross Proceeds (£millions)	73	7	374	0	4200	186	59	409	0	3000
Gross Proceeds/MV	0.60	0.12	5.86	0.00	88.93	0.20	0.07	0.70	0.00	7.36
Shares Placed /Sh.Cap.	0.21	0.15	0.20	0.00	0.89	0.12	0.08	0.12	0.00	0.60
Firm age (years)	7.97	3.83	9.68	0.17	40.67	12.24	6.67	12.91	0.25	41.08

4.5.2. Sample characteristics

The final samples are described in Table 4.1. They involve 353 placings by 283 companies. Approximately 21% of the placings are followed by a previous placing from the same company. 11 cases involve simultaneous primary and secondary placings (same day announcement for 11 primary and 11 secondary placings). Typically, the news reports related to such simultaneous placings state that the seller (usually member of the management team or large block holder) takes advantage of positive market reactions or identify a window of opportunity to sell shares at a higher price, due to the arrangements of the primary placing. Thus, each sample includes 11 placings from the same company, referred to the same day.

The secondary placement firms are much bigger in size, suggesting lower asymmetric information. The primary and secondary offering firms document mean (median) market value of 1.3 (0.048) billions and 5.1 (0.9), respectively. Additionally, the primary placings appear to consist of very large firms in comparison to the SEO size reported by previous UK studies (e.g. Armitage, 2010; 2007; Barnes and Walker, 2006; Slovin et al., 2000). Although not tabulated in Table 4.1, the difference in the firm size is attributed to the inclusion of placings smaller than the 5% cut-off point of the shares outstanding (Table 5.1 presents descriptive statistics for the two sub-samples). Such deviations in the firm size are also documented by Balachandran et al. (2009) who include smaller placements (in relative offered size) and accelerated book-buildings.

The primary placing firms offer approximately 22% (15%) of their share capital, while secondary offerings about 12% (8%). Similarly, the proceeds collected as percentage of the firm value is 60% (12%) of the primary and 20% (7%) for the secondary placings. Hence, the relative offered size and the value offered is much bigger for the primary rather than the secondary offerings. These differences imply different incentives to place equity and larger discount for primary placings are expected (as there is higher asymmetric information but less amounts collected). Indeed, the gross proceeds collected are 73millions (7m) for primary placings but

186m (59m) for secondary.[30] Finally, the secondary placing firms are 'older', in terms of being listed for longer. Thus, more information about them is available to the market. Precisely, they are listed for approximately 12 (7) years compared to 8 (4) of primary placements. Overall, it seems that the two samples have substantial differences. The larger firm size and age of the firms participating into block of already listed shares suggests lower asymmetric information. Hence, lower discounts/ premiums are also expected.

4.6. Findings and discussion

4.6.1. Descriptive statistics

4.6.1.1. Discount/premium

➢*Private placements*

Consistent with the existing evidence, the UK placing samples are mainly offered at discount (see Table 4.2). The mean (median) discount of primary placings ranges from -10% (-7%) to -11% (-8%) depending on the day, all highly significant at the 1% level. Notably, the third column that presents the adjusted premium/discount indicates statistically insignificant mean 1.5% but significant median -5.9%. The fact that the discount level is lower indicates the significant impact of the mechanical dilution on the offered discount/premium. Recall that all else being equal, the adjusted price should equal the market one at day +1 after the announcement. Significant differences between the two prices imply information effects, agency, inelastic demand and/or other factors that affect the real premium /discount.

Although the discount levels reported are consistent with the empirical evidence (e.g. Hertzel and Smith (1993) report -9% to -14% depending on the sub samples used; Wruck (1989) reports discount levels around -11% to -13% at the day prior the announcement depending on whether the stock is registered or not), the discrepancies

[30] It is worthwhile to note that a few primary placing firms announce reorganisation and reconstruction along the placing, causing enormous amounts at the time. This might drive the discrepancies between the offer size and market value. To control for it, the discount is winzorized at the 1st and 99th percentiles.

between minimum and maximum are extremely large. This implies heterogeneity in investor valuations (Armitage, 2010).

Attempting to explain *why* there is such big variation in investor valuations, the samples are reallocated based on whether they are priced at premium or discount to the prevailing market price (see Panels B and C). 84% of the primary placings are priced at discount to the market price at t=-1 and only 16% (36 cases) are priced at premium. Mean (median) premium is +13% (+7%). At the day following the announcement t=+1, 17% (38 cases) of the primary placings are priced at lower premium of +11% (+5%), suggesting rise in market price after the announcement.

Nonetheless, the more days after the announcement, the more stocks are priced at premium, suggesting downward direction in market prices. At day t=+10, 25% placings of the primary sample (58 cases) are priced at premium of +14% (8%). Hence, the market price temporary rise immediately after the announcement of placing shares at premium, but soon recovers. This might suggest that the market needs few days to adjust or understand the premium implications. Consistently, based on the adjusted offer price $P_{Adj,t=+1}$, 23% of the sample (56 placings) are priced at premium. The mean is extremely high to +56%, driven by very few stocks, whereas the median is 8% which is similar to the premium based on t=+10. Again, this implies the market does not immediately understand the premium reasoning.[31]

Regarding the discounts, they become smaller the days following announcement, suggesting rise in market prices. The discount is -14.6% (-9%) at t=-1, increases to -15.4% (-10%) at t=+1 and subsequently increases further to -18% (-13%) at t=+10. Therefore, the market prices follow an upward trend after the announcement. Discount of -15% (-9%) is also reported based on the adjusted market price $P_{Adj,t=+1}$.

[31] Discounts and premiums are by default unequal to zero. Statistically insignificant premium would have been reported only in case the premium equals or it is marginally larger than zero.

Table 4.2: Pricing of placings

The table provides details about the pricing of the placings. The reported values represent the premium as percentage of the market value, calculated as the difference between the placing price (collected from the news report/prospectus) and the prevailing market price as at the day *t* (t=0 is the announcement day), scaled by the market price (negative premium is discount). The adjusted premium (Adj.t=+1) is measured as the weighted average price between the market price prior the announcement and the placing price, divided by the adjusted market price. All values are winzorized at the 1st and 99th percentiles: the values below the 1st and above the 99th percentile of the premium distributions are set equal to the 1st and 99th percentile value, respectively. The p-values of the parametric t-test and non-parametric (Wilcoxon) tests under the null of zero mean and median, are presented in brackets.

	Primary Placings				Secondary Placings			Primary vs. Secondary		
Day	t=-1	t=+1	Adj. t=+1	t=+10	t=-1	t=+1	t=+10	t=-1	t=+1	t=+10
Panel A: Placing premium										
N	230	230	230	230	123	123	123			
mean	-0.103	-0.111	0.015	-0.099	-0.041	-0.035	-0.027	-0.062	-0.076	-0.072
p-value	(0.000)***	(0.000)***	(0.723)	(0.000)***	(0.000)***	(0.001)***	(0.066)*	(0.000)***	(0.000)***	(0.001)***
median	-0.073	-0.077	-0.059	-0.082	-0.029	-0.029	-0.039	-0.044	-0.048	-0.043
p-value	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
stdev	0.186	0.182	0.631	0.216	0.118	0.113	0.165			
Min.	-0.667	-0.702	-0.931	-0.705	-0.487	-0.490	-0.515			
Max.	0.560	0.507	4.211	0.645	0.560	0.507	0.645			
Panel B: Placings priced at discount										
N	194	192	177	172	101	88	87			
N%	84.35%	83.48%	76.96%	74.78%	82.11%	71.54%	70.73%			
mean	-0.146	-0.154	-0.151	-0.179	-0.070	-0.072	-0.093	-0.077	-0.082	-0.086
p-value	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
median	-0.089	-0.100	-0.088	-0.131	-0.040	-0.047	-0.066	-0.049	-0.053	-0.066
p-value	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***
stdev	0.153	0.157	0.188	0.165	0.084	0.085	0.091			
Min.	-0.667	-0.702	-0.931	-0.705	-0.487	-0.490	-0.515			
Max.	-0.001	-0.002	-0.001	-0.002	-0.002	-0.002	-0.005			
Panel C: Placings priced at premium										
N	36	38	53	58	23	36	36			
N%	15.65%	16.52%	23.04%	25.22%	18.70%	29.27%	29.27%			
mean	0.131	0.105	0.566	0.137	0.086	0.054	0.127	0.045	0.051	0.009
p-value	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.014)**	(0.013)**	(0.000)***	(0.305)	(0.103)	(0.810)
median	0.073	0.047	0.088	0.081	0.015	0.014	0.031	0.058	0.033	0.050
p-value	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.000)***	(0.058)*	(0.002)***	(0.247)
stdev	0.172	0.140	1.106	0.170	0.156	0.123	0.195			
Min.	0.000	0.000	0.000	0.000	0.000	0.000	0.000			
Max.	0.560	0.507	4.211	0.645	0.560	0.507	0.645			

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

Consistent with Barclay et al (2001), the difference between the discounts and premiums is approximately 25%-30%. However, they refer to sample differences, primary vs. secondary, not discount vs. premium within the same placing type. Only 14% of their primary placings are priced at premium, but the majority of secondary placings are priced at premium, having a 30% difference between the primary and secondary samples. The findings of this study reveal different situation in the UK.

➢ *Secondary placings*

The majority of the secondary placings are also priced at discount. The mean (median) discount is approximately -3% (-4%) to -4% (-3%) of the market price, significant at the 1% lever. Thus, secondary placings are not priced at premium as Barclay et al. (2001) suggest. They are offered at a discount which is less than half in comparison with that of the primary placing. They are offered at a discount which is approximately 6% (4%) to 8% (5%) lower, with this difference being statistically significant at the 1% level. The economic interpretation is that, investors are willing to pay approximately +7% more for existing shares than new issues. The fact that secondary placings are valued at price closer to market one is consistent with the expectations and the predictions according to the descriptive statistics of Table 4.1. The lower pricing reflects lower asymmetric information for this sample.

Similar to the primary placings, large investor heterogeneity on the offered price is reported. Distinguishing between the placements priced at discount and premium, the average difference between discount and premium is approximately 13%-15%. Not 25%-30% as the primary sample. This again is consistent with the lower asymmetric information associated with the secondary placings.

The mean (median) discount level is –7% (-4%), -7% (-5%) and -10% (-7%) for the days -1, +1 and +10 around the announcement, respectively. These discount levels are again about half of corresponding discounts of the primary placings. This difference of about 8% (5% - 6%) is statistically significant at the 1% level. Thus, the lower asymmetric information of the secondary offers seems to affect the stock valuation (section 4.6.2.2 examines this issue further).

Regarding the premium sub-sample, only 19% secondary placements (23 cases) are offered at premium based on the market price the day before the announcement -1. The number of placements at premium increases to 29% (36 placements) at the subsequent days. The premium equals to +9% (+1.5%) based on the market price at t=-1 and, reduces to +5% (+1.4%) at the day +1 following the announcement. It thus indicates a relative increase in the market price. However, by the day t=+10, the premium rises to +13% (+3.1%). This suggests the market requires few days to interpret the premium (whether adverse information signals are associated or not).

While the premium of the secondary shares seems lower than that of the primary placements, the differences between them are not statistically significant. Only for the day +1 the difference is statistically significant. These insignificant differences are in line with hypothesis *H4.4α*, that private benefits and the premium are not driven by the placing type (primary vs. secondary). The paths fo the market prices for the premium sub-samples are also similar.

4.6.1.2. Ownership and managerial changes

- *Ownership*

In sequence, Table 4.3 presents details on the changes in ownership concentration and changes in management around the placements.[32] Consistent with the original monitoring argument (Wruck, 1989) ownership concentration decreases significantly after the placing for both samples, primary and secondary (Panel A). The ownership dispersion is consistent with Slovin et al. (2000), who report significant ownership dispersion for UK placings and argue that institutions and other investors join the company to act as external monitor factors.

When distinguishing between placings priced at discount and premium, only the discount sub-samples document significant ownership dispersion. This holds for both, primary and secondary offerings. However, the difference in ownership

[32] Investigating hypotheses *H2* and *H4b* requires the examination of monitoring signs (e.g. ownership concentration and managerial turnovers). Such data could be available by databases for recent years only (e.g. Nominus database reports ownership data mainly from 2000 onwards, while only for few cases data are available from 1998. Datastream also provides ownership data from 2002 and onwards). It was thus impossible to include data for the placings before 2002. This has a result to reduce the number of observations.

changes between discount and premium is not statistically significant. It is inconsistent with the view that when investors are willing to pay more for the stock will indicate higher monitoring in terms of reducing ownership concentration.

Table 4.3: Changes in ownership and management turnovers around the offers

Panel A presents the ownership concentration and its changes after the equity placing. *Concentr. Before* and *Concentr. After* are the sums of the portions of the six largest beneficial holders before and after the placing, respectively. The difference in ownership concentration is the change in concentration variable ($\Delta concentr.$). The null hypotheses are zero changes in means and medians after the placing. Panel B presents the means and medians of managerial turnovers around the placings. It presents the changes among directors, within ±4 months and ±1 year surrounding the placings. The turnovers are measured as the director changes within the corporation. Directors are considered to be both, executive and non-executive (including chairman, CEO, CFO, COO, production managers or other managers reported as executives). The managerial changes are percentages to the total number of the directors.

	PRIMARY			SECONDARY		
Panel A: Ownership concentration and changes						
	Concentr. Before	Concentr. After	Δ Concentr.	Concentr. Before	Concentr. After	Δ Concentr.
			Full samples			
Mean	53.69	51.43	-2.55***	49.23	45.17	-4.24***
Median	52.62	49.42	-1.86***	46.88	42.12	-3.97***
			Priced at discount			
Mean	52.890	50.321	-2.804***	49.420	44.912	-4.544***
Median	50.890	49.350	-2.25***	47.140	42.120	-4.105***
			Priced at premium			
Mean	57.121	56.134	-1.483	48.100	46.657	-2.382
Median	58.050	51.550	-1.45**	46.620	43.635	-3.500
			Discount vs.. Premium			
Mean	-4.230	-5.813	-1.321	1.320	-1.745	-2.162
Median	-7.160	-2.200	-0.800	0.520	-1.515	-0.605

Panel B: Managerial turnovers								
Months:	(-12, -4)	(-4, 0)	(0, +4)	(+4, +12)	(-12, -4)	(-4, 0)	(0, +4)	(+4, +12)
				Full samples				
Mean	0.193	0.066	0.097	0.189	0.126	0.057	0.107	0.151
Median	0.125	0.000	0.000	0.134	0.056	0.000	0.000	0.059
				Priced at discount				
Mean	0.208	0.064	0.100	0.196	0.129	0.058	0.094	0.122
Median	0.143	0.000	0.000	0.143	0.05	0.00	0.00	0.05
				Priced at premium				
Mean	0.122	0.075	0.085	0.159	0.118	0.050	0.158	0.273
Median	0.000	0.000	0.000	0.039	0.063	0.000	0.024	0.200
				Discount vs. Premium				
Mean	0.086**	-0.011	0.015	0.037	0.011	0.009	-0.063	-0.151**
Median	0.143**	0.000	0.000	0.105	-0.010	0.000	-0.024*	-0.155**

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

➢ *Managerial turnovers*

Nevertheless, ownership concentration cannot tell an adequate economic story related to the monitoring hypothesis, as investor post-purchase activity (not only the

ownership dispersion) is a significant factor in monitoring the incumbents (Krishnamurthy et al., 2005). Active investors should be associated with abnormal changes in the management of the placing firm (Bethel et al., 1998; Barclay and Holderness, 1991). Otherwise entrenchment is possible (Barclay et al., 2007).

Panel B documents managerial turnovers for the months surrounding the event. The management of primary placings changes on average by 7% within the 4 months period before the announcement (-4, 0) and by 10% the later months (0, +4). Similarly, the average management turnover of the secondary offers for the months (-4, 0) is 6% and 9% for (0, +4). However, the medians are zero for both placing types and they are statistically not far from zero in time-series manner.33 Hence, although ownership concentration disperses, there are no direct signs for shareholder activity. The fact that managerial turnovers are mainly normal does not comply with the monitoring argument (H4.2a and H4.2b). It rather suggests entrenchment, especially in the case that investors are existing shareholders that increase their stakes and bargaining power.

When distinguishing the primary placings based on the discount and premium paid, the premium sub-sample indicates lower managerial turnovers for the months (-12, -4). The difference from the discount sub-sample being statistically significant at the 5% level. This is in line with the view that active investors are willing to pay more to increase firm value (H4.4b). During the remaining months, the managerial activity between the two sub-samples is similar. Additionally, with regards to the secondary placings priced at premium, they document significantly higher managerial turnovers the months after the event. This is again consistent with hypothesis H4.4b

4.6.1.3. Investor identity, ownership and discount/premium paid

As the identity of investors might indicate activity incentives or incentives to buy at discount or premium, Table 4.4 describes the 'players' of the primary and secondary

[33] The changes in management within ±3 years around the placing are also examined for both placing types. The mean managerial turnovers for the primary and secondary sample range from 16.4% to 30.3% and 16.6% to 29%, respectively. In both offering types, the managerial turnovers peak at the event year (0-12 months). However, the managerial turns are not significant in time series manner (comparing the differences during the years, the null hypothesis of zero abnormal turnovers cannot be rejected).

offers, after being categorized into institutional, corporate and individual (see Appendix I for details on the classification). Similar investor identification for the UK is documented by Franks et al. (2001). The table presents the net change in their ownership, i.e. whether they end up increasing or reducing their stake. It also shows descriptive statistics on the discount or premium paid by each investor category. While the levels of discount/premium are not significantly different among the investor categories, the table facilitates in understanding the implications around the placings in terms of the decisions to buy or sell the event stock.[34]

➢*Private placements*

The primary shares are placed with several investors rather than a single or few investors, while the majority of them go to existing institutions. Specifically, 190 institutional investors participate to the 230 private placings, 75 corporations and 190 individuals. It is hence obvious that several investor types might participate into the same placing, contrary to the US arguments about single investors (Wruck and Wu, 2009; Krishnamurthy et al., 2005). This is consistent with Armitage (2010) that several investors participate into UK SEO. The placing causes increase in the institutional holdings by 35%. Corporate and individual investors also increase their stakes by 9% and 8% respectively.

Distinguishing the holdings based on whether the placing is at discount or premium, institutions increase their stake by 38% when it is at discount (about -14% discount) and by 25% when premiums are involved (about +9.5% premium). Note that premium cases are only 29, contrary to 153 discount cases.

Corporations increase their stake by only 6% when the offer is at discount (about -16% discount) but by 21.17% when premium is involved (about 9% premium). The premium cases are only 11, while discount involve 56 cases. These different valuations and participations suggest different incentives to participate to the placing e.g. institutions might aim monitoring (Allen, 2000; Chemmanur et al., 2009).

[34] Although not tabulated, changes in ownership categories as provided by Datastream are also examined. The number of shares held by employees and investors with substantial position in the company with significant voting rights (NOSHEM), by investment companies (NOSHIC), pension funds (NOSHPF), strategic investors who hold shares that public investors do not have access (NOSHST), foreign investors (NOSHFR) and government holdings (NOSHGV). The placing does not affect these group ownerships.

Corporations might foresee synergy creation (Allen and Phillips, 2000) or improve the value of less well performing firms (Krishnamurthy et al., 2005) when premiums are involved. Individual investors also increase their stake by 6% when they buy at discount (about -14% discount) but by 12.5% when the shares are at premium (about 10% premium). This is consistent with the view that individuals participate when they have benefits to do so and they are willing to pay more (*H4.4b*).

Table 4.4: Type of the placing investors and offered discount/premium

The table presents the percentages of the holdings of the placing investors categorized to institutional, corporations and individuals. Institutional holders include all the investment trusts, fund managers, pension funds, insurance companies and generally, all firms included in the general financial industry. Corporations are industrial companies. Individuals include managers, directors, family members or other owner that the beneficial is a single person. Individuals are further sub-divided into: 1) management members, directors and family members, 2) employees, 3) other individuals and 4) undisclosed accounts. The management members' information was extracted from the placing prospectuses (if any) when it was clearly stated that a member of management was to subscribe for the placing shares. The family member information is mainly collected from Nominus database, under the heading of family trusts or similar. The other individuals and undisclosed holdings are mainly collected from Nominus.The discount/premium is measured as in Table 4.2.

	PRIMARY			SECONDARY		
	N	Mean	Median	N	Mean	Median
Panel A: Buyes of the offer in percentage of their participation						
Institutional	190	35.83%	36.16%	97	20.43%	12.99%
Corporation	75	8.94%	2.17%	42	-25.57%	-22.82%
Individual	190	8.12%	5.57%	97	-16.60%	-2.80%
	455			236		
At discount						
Institutional	155	38.16%	41.49%	81	19.99%	12.40%
Corporation	57	6.02%	1.69%	35	-34.11%	-31.08%
Individual	154	6.32%	5.57%	82	-14.95%	-0.86%
At premium						
Institutional	30	25.43%	23.22%	16	22.64%	17.93%
Corporation	16	21.17%	13.37%	7	17.15%	0.08%
Individual	31	12.54%	1.39%	15	-25.64%	-17.96%
Panel B: The discount payed						
Institutional	153	-0.144	-0.088	83	-0.063	-0.036
Corporation	56	-0.161	-0.084	39	-0.057	-0.040
Individual	152	-0.144	-0.088	83	-0.069	-0.040
	361			205		
Individual details						
Director / MGT / Family	12	-0.167	-0.097	4	-0.095	-0.052
Employee	11	-0.099	-0.080	8	-0.078	-0.020
Other individual	133	-0.146	-0.091	68	-0.070	-0.042
Undisclosed A/C	145	-0.144	-0.088	76	-0.065	-0.038
Panel C: The premium payed						
Institutional	29	0.095	0.060	17	0.067	0.012
Corporation	11	0.089	0.084	8	0.031	0.012
Individual	30	0.104	0.068	17	0.067	0.012
	70			42		
Individual details						
Director / MGT / Family	2	0.153	0.153	3	0.005	0.001
Employee	1	0.143	0.143			
Other individual	26	0.115	0.089	13	0.049	0.007
Undisclosed A/C	29	0.095	0.060	17	0.067	0.012

➢ *Secondary placements*

With regards to the 123 secondary placements, 97 institutional investors participate, 42 corporations and 97 individuals. This again contradicts the US arguments about involvement of few active investors into transactions with existing shares (Barclay and Holderness, 1991; Allen and Phillips, 2000; Bethel et al., 1998). Approximately 20% of the secondary shares go to institutions, as a net increase of their stake. Contrary, corporation and individual investors reduce their stakes by -25.6% and -16.6%, respectively.[35]

These percentages change when we take into account whether the shares are bought at discount or premium. While the participation of institutional investors remains relatively stable at 20% when discount is involved (about -6% discount), they increase their participation to 23% when the offer is at premium. This suggests monitoring activities and certification of institutional investors (Allen, 2000).[36] Contrary, corporations reduce their stake by -34% when the offer is at discount (about -7% discount) but increase their ownership by 17% when premiums are involved (about +3% premium). Possibly corporate investors sell overvalued stock (Lee, 1997), but buy when they foresee synergy creation (Allen and Phillips, 2000). Individuals also reduce their participation regardless of the offer being at discount or premium: by -15% when discount of -6% is paid and by -26% when premium of 7% is paid. This could be a signalling tool, suggesting adverse information and implication that insiders sell overvalued stock (Lee, 1997).

4.6.2. Explaining the offered discount

As descriptive statistics are only suggestive, Table 4.5 applies OLS multivariate cross-sectional regression analysis. Dependent variable is the offered discount, estimated based on the market price at the day prior the announcement as in section

[35] In fact, corporate investors buy approximately 28.33% but sell 50.12%, whereas individuals buy 11.83% and sell 29.20%. Among individuals, the group with the largest sales is the other individuals (34.26%), followed by the directors/family members (18.10%), undisclosed accounts (6.54%) and employees (3%).

[36] Corporate governance studies document significant role of institutional investors in terms indirect means of activism and monitoring (Carleton et al., 1998; Mikkelson and Ruback, 1985; Opler and Sokobin, 1998; Smith, 1996). It is argued that institutional investors reduce transaction costs and the level of information asymmetries.

4.6.1.1. Explanatory variables are proxies for each of the testable hypotheses as developed in section 4.4.2. Since the three hypotheses are not mutually exclusive, having all variables in a single model facilitates in identifying which hypothesis has a greater weight on the offered discount. The analysis also follows a backwards stepwise regression approach. All variables are initially included into a single model. In every step the model runs, the least suitable variable is removed. The final model consists of the significant variables only (at the 10% level). Individual regressions for each testable hypothesis are also run, for both equity placing types (primary and secondary). However the conclusions drawn are qualitatively the same with the full models and thus, not tabulated.

4.6.2.1. Primary placings priced at discount

With regards to the primary placings, the first model documents the $\Delta concentr * D_{mgt\_turn}$ as the only significant variable. It has a small, closed to zero positive coefficient of 0.0004, significant at the 5% level. While this has small economic value, the model 2 that follows a backwards stepwise regression approach suggests that liquidity and inelastic demand are the main driving factors of the offered discount, in UK placings.

Precisely, the volume turnover $\%Volm$ has the highest coefficient of -2.769. This suggests liquidity and information asymmetry costs. The impact of pure information effects is also noticeable, as the coefficient of the firm size is negative (-0.14) and statistically significant at the 1% level. In addition, the $OffSize * D_{HighSpread}$ has a significantly positive coefficient of 0.194. As this proxy captures the relative offer size of the firms with the highest liquidity risk (belonging to the highest spread quartile), it implies inelastic demand and relevant risks (Corwin, 2003).

Recall that certification and liquidity hypotheses are both subject to information asymmetries. However, they refer to different nature of costs and different placing implications. Observing the coefficients of past-performance and return volatility, that capture the certification impact on the discount, they are both statistically insignificant. Hereby, although the liquidity variables such as volume and bid-ask

spread also capture asymmetric information (e.g. Wu, 2004), the fact that the past-performance and volatility are not significant, suggests the discount is to compensate investors for liquidity costs and risks (*H4.3α*) rather than certification (*H4.1α*).

Table 4.5: Cross-sectional regression analysis for the discount

The table presents White (1980) corrected coefficients of OLS analysis, with explanatory the discount as defined in Table 4.2. *Age* is the years since the corporation listing. *F.Value* reflects the firm size, *Volatility* is the volatility of abnormal return for the months (-36, -1) prior the event. $AR_{pre\text{-}offer}$ is the abnormal holding return of the previous year. *Concentration* is the existing ownership concentration and *Δconcentr* is the change in concentration before and after the events, as described in Table 4.3. *OffSize* is the relative offered size, *Spread* is the bid-ask spread, *TrVolm* is the trading volume and *%Volm* is the volume turnover as percentage of the shares outstanding prior the event. $\Delta concentr * D_{mgt\_turn}$ is an interaction term between the *Δconcentr* and a binary variable (D_{mgt_turn}) that takes 1 when managerial changes are reported within the ±4 months around the announcement. *Str.inv* is a binary variable that takes 1 when strategic investor participates, and zero otherwise. $OffSize * D_{High\_Spread}$, is an interaction term defined as the product between the *OffSize* and a binary variable D_{High_Spread} that takes 1 when the standard deviation of the trading volume is in the 4th quartile of the distribution and, zero otherwise. Observations beyond ±2 error standard deviations are omitted to avoid outlier impact. A VIF 10 cut-off point is used for multicolinearity. SW denotes a backwards stepwise regression approach: all variables are initially included into the model. In every step the model runs, the least suitable variable is removed. It ends with a model including only the significant driving factors (at the 10% level).

Variables	Prediction	PRIMARY PLACINGS		SECONDARY PLACINGS	
		1	2 (sw)	3	4 (sw)
Intercept		0.046	0.163***	-0.071	-0 .078**
Age	*- (info costs)*	0.0002		0.000	
F.Value	*- (info costs)*	-0.008	-0.014***	0.015**	0.009*
$AR_{pre\text{-}offer}$	*- (high quality), + (overvaluation)*	-0.005		0.006	
Volatility	*+ (uncertainty)*	0.088		0.165***	0.126*
Concentration	*+(info costs)*	0.001		0.001*	0.0006**
Δconcentr	*+ (Monitor), - (Pr.Benefits)*	-0.002	-0.002**	-0.002**	-0.0009*
$\Delta concentr * D_{mgt\_turn}$	*+ (Monitor), - (Pr.Benefits)*	0.004**	0.004***	0.002**	0.0009*
Str.inv	*+ (Monitor), - (Pr.Benefits)*	-0.007		0.004	
Spread	*+ (liquidity or info costs)*	0.238		1.934**	1.76**
TrVolm	*- (liquidity or info costs)*	0.000		-0.007	
%Volm	*- (liquidity or info costs)*	-2.396	-2.769*	0.854	
OffSize	*+(inelastic demand)*	0.102		0.018	
$OffSize * D_{HighSpread}$	*+(inelastic demand)*	0.081	0.194***	-2.219	
Obs		127	127	61	61
Adj. R^2		0.363	0.354	0.362	0.393
F-Stat.		5.82***	9.79***	9.38***	5.71***

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

Regarding the monitoring hypothesis (*H4.2α*), the model reports a small negative coefficient of change in ownership concentration ($\Delta concentr = -0.002$), statistically significant at the 5% level. Nonetheless, as mentioned, the change in ownership structure (tabulated in Table 4.3) alone cannot be interpreted as activity sign. The variable is unable to distinguish between monitoring or entrenchment; the change in

largest beneficial owners might also suggest changes among existing shareholders that do not aim further monitoring. As the coefficient of $\Delta concentr * D_{mgt\_turn}$ is positive (0.004) and significant at the 1% level, could suggest small impact of monitoring costs, consistent with the corresponding hypothesis.

Overall, the model supports the third hypothesis (*H4.3α*) and the view that investors require discount to hold an illiquid stock that has downward sloping demand curve (Corwin, 2003). Probably, liquidity costs are driven by the level of asymmetric information around the placings. However, the discount does not seem to be driven by uncertainty about the issuer value. As a conclusion, the costs to place illiquid stock lead investors to require discount as compensation to invest to the particular placing. Monitoring has only a small weight.

4.6.2.2. Secondary placings priced at discount

In sequence, models 3 and 4 examine the three testable hypotheses related to the discount of the secondary placings. Both models report the bid-ask spread as the variable with the highest coefficient (1.93 and 1.76 for models 3 and 4 respectively) which is statistically significant at the 5% level. This suggests that investors need to be compensated for the high transaction costs, consistent with the liquidity hypothesis and asymmetric information. The stock volatility also documents significantly positive coefficient of 0.165 and 0.126 for the two models, suggesting uncertainty about the stock value. In line with this, the firm value documents small but significantly positive coefficient of 0.009, which implies again asymmetric information. Small but significant impact is also documented by the managerial turnover interaction term ($\Delta concentr * D_{mgt\_turn} = 0.0009^{*}$), suggesting small monitoring costs for which investors require discount.

Therefore, although the secondary placements document lower asymmetric information in comparison with the primary shares (see Table 4.1 and Table 4.2), it appears that the information asymmetry in the secondary offerings plays a greater role in the discount set up. These findings propose that investors are uncertain about the issuer value, attributable to asymmetric information between them and the sellers. This is in line with *H4.1b* and the view that the insiders might sell overvalued stock

(Lee, 1997). Hence, the sale of the secondary stock might signal potential overvaluation for which investors require compensation.

These results differ from the prior evidence on secondary placings. Considering that secondary placings have been associated with higher activity (Allen and Phillips, 2000; Barclay and Holderness, 1991; Barclay et al., 2001) it suggests expectations for value improvements for which significant monitoring costs are pronounced. Instead, the secondary placings in the UK appear to consist of stocks with higher uncertainty. This is the dominant determinant the offered discount.

4.6.3. Placements priced at premium and private benefits

➢ *Premiums are not affected by the placing type*

Having analysed the discount and its determinants for both samples, this section investigates the premium and hypothesis *H4.4*. The findings comply with hypothesis *H4.4α*. If investors aim private benefits and are willing to pay premium, they are indifferent with the way they buy the stock. Table 4.2 reports that the difference between the primary and secondary discount/premium is statistically significant only for the discount sub-sample. No significant differences are reported for premiums, consistent with this hypothesis.

Similarly, Table 4.6 applies backwards stepwise regression analysis that examines the premium. Three models are run with dependent variable the premium based on day prior the announcement t=-1, the day after t=+1 and 10 days afterwards t=+10. The reason to use the premium based on the market price after the announcement lays on the assumption that an investor would not pay more than the market price after the information is revealed and incorporated into the market prices, unless he/she pursues private benefits (Barclay and Holderness, 1989).

The two placing samples (primary and secondary) are distinguished with a binary variable *sample.dummy* that takes 1 when the placing belongs to the secondary offers and zero for the private placements. This variable is not statistically significant in any model, consistent with hypothesis *H4.4α*. This suggests again that the two

samples are not valued differently because they constitute different placing types per se. An investor who pursues personal goals is indifferent by the way he/she buys the stock (from the market or from the firm).

Table 4.6: Cross-sectional regression analysis for the premium

The table presents White (1980) corrected coefficients of OLS analysis, when backwards stepwise regression approach is followed. All variables are initially included into the model. In every step the model runs, the least suitable variable is removed, ending with a model including only the significant driving factors (at the 10% level). Explanatory variable is the premium as defined in Table 4.2. All variables are as described in Table 4.5. Observations beyond ±2 error standard deviations are omitted to avoid outlier impact. A VIF 10 cut-off point is used for multicolinearity.

Variable	Prediction if private benefits	1 premium t=-1	2 premium t=+1	3 premium t=+10
Intercept		0.083***	0.142***	0.184***
sample.dummy	*insignificant*			
Age	(-)	-0.003***	-0.001*	-0.013*
F.Value	(-)			
$AR_{pre\text{-}offer}$	(-) *or overvaluation*			
Volatility	(-)			
Concentration	(+)	0.002*		
Δconcentr	(-)			
$\Delta concentr * D_{mgt\_turn}$	(-)			
Str.inv	(+)			
Spread	(+)	-0.759**	-0.351***	-0.45**
TrVolm	(-)	-0.013**	-0.010***	
%Volm	(-)			
OffSize	(-)		-0.181*	
$OffSize * D_{HighSpread}$	(-)		0.259**	
Obs		39	46	54
Adj. R^2		0.134	0.194	0.026
F-Stat.		6.89***	6.89***	2.83*

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

➢ *Premium for stocks with higher uncertainty, no monitoring activities and/or less liquidity reflects private benefits*

Beyond the *sample.dummy* Table 4.6 reports significant negative coefficient of -0.001 to -0.003 for the firm age. This holds for all three models and suggests higher premium for younger firms, i.e. for a stock with higher asymmetric information. Model 1 also reports positive coefficient of 0.002 for the ownership concentration, significant at the 10%. This suggests again higher premium for a more concentrated stock, i.e. for a stock with higher information and monitoring costs. Likewise,

models 1 and 2 report significantly negative coefficients for the trading volume, of -0.01, while model 2 additionally documents a coefficient of -0.181 for the relative offered size. These coefficients suggest that investors are willing to pay more for a less liquid stock.

Why an investor would pay more for a stock which is highly concentrated and with higher asymmetric information? Although both of these variables have small economic value (as they are close to zero) they suggest private benefits. This interpretation is in line with the activity signs of private placements offered at premium reported in Table 4.3 (Table 4.3 suggests dispersion in ownership concentration and significant managerial turnovers around the placements priced at premium).

Nonetheless, all three models of Table 4.6 report a negative coefficient for the bid-ask spread, about -0.35 to -0.76 statistically significant at the 5% and 1% levels. This implies that the shares priced at premium are subject to lower transaction costs. Hence, the negative coefficients of trading volume, relative offered size and age, as well as the positive coefficient of ownership concentration possibly suggest that the stocks priced at premium are of higher liquidity and lower transaction costs which attract premiums.

To fully explore the implications around placings priced at premium and distinguish between the possibility that premiums are related to investor intentions to improve firm value or to extract private benefits, the study conducts a standard event-study with a three-day window around the premium announcements. The market reactions are about +3.5%, however normal in terms of statistical significance (not shown for brevity). This suggests the market might require some time to understand the signals sent; whether investors buy at premium to improve firm value or to purely extract private benefits. This interpretation is consistent with the discount paths reported at Table 4.2 which reports downward price path by the tenth day following the announcement. This is in line with the private benefits hypothesis. Examining the differences between the two offering types, they are again statistically insignificant, pointing that the placing type is not important when investors have self-dealing incentives (Wu and Wang, 2005).

4.7. Summary and conclusions

This chapter investigates the factors affecting the discount or premium of UK non pre-emptive equity offerings. Prior literature attributes discounts of private placements to costs incurred by informed investors to certify the firm value (Hertzel and Smith, 1993), to monitoring (Wruck, 1989) or entrenchment costs (Barclay et al., 2007). In addition, high liquidity and price pressure due to inelastic demand appear important on the discount of right issues (Armitage, 2007), public offerings (Corwin, 2003; Altinkilic and Hansen, 2003) and sale-restricted private placements (Maynes and Pandes, 2008; Silber, 1991).

However, the extant literature disregards the impact of liquidity costs on private placings without sale restrictions. In addition, little evidence exists for the price techniques related to secondary offers, while prior literature avoids examining separately offers priced at premium. On that basis, this study contributes by investigating the certification, monitoring and liquidity possibilities for these two non pre-emptive offering types in the UK (primary and secondary). It additionally examines whether premiums reflect private benefits (Barclay and Holderness, 1989).

Table 4.7 summarizes the main findings, as follows. First, having investigated the discount or premium, large heterogeneity is observed. A difference of about 25%-30% between the discounts and premiums of the private placings is reported. This confirms the large variation in the offered price value in the UK (Armitage, 2010). The results advocate that the discount of UK placings reflects mainly liquidity and information costs. The discount of new placing shares is driven the relative offered size and liquidity risks, suggesting inelastic demand. Investors require discount to invest to the particular stock due to liquidity risks (Altinkilic and Hansen, 2003; Corwin, 2003).

An alternative interpretation would be that the higher offered size entails larger investigation costs for which investors require discount, consistent with the certification hypothesis (Hertzel and Smith, 1993). While both interpretations are subject to information asymmetries, the analysis suggests liquidity rather than

certification because proxies for firm quality such as past-performance and return volatility do not significantly affect the offered discount. Instead, the bid-ask spread, trading volume and the relative offer size do. Therefore, the study advocates that liquidity is a dominant factor in determining the discount in private placings, even when no sale restrictions are imposed. This has been disregarded by prior studies.

Moreover, monitoring has only a small weight in explaining the discount. This contradicts the suggestion of Slovin et al. (2000) that external monitor factors are likely to improve the firm value of UK placings. While the small weight of monitoring is consistent with the arguments of Barclay et al (2007), the discount is not about entrenchment or other agency issues either. It is mainly about liquidity.

Regarding the secondary offerings, they are also priced mainly at discount. However, they are offered at about half discount in comparison with the primary placings (7%) and document about half discrepancies between the premium and discount (about 15%). This suggests that the offerings are subject to lower asymmetric information in comparison with the primary sample. This is also plausible, considering that the stock is already listed and the market has already assessed its value (Lee, 1997).

Regardless, the analysis attributes the discounts of secondary offerings to uncertainty about the value of the shares sold. The study advocates that investors are uncertain about the stock value for which they require discount. This favours the view that the sellers might 'knowingly' sell overvalued stock (Lee, 1997). In addition, the findings are inconsistent with the prior common perception that secondary placings involve active investors (Barclay and Holderness, 1991; Allen and Phillips, 2000; Bethel et al., 1998). In such case increased monitoring costs would be observable. Contrary, small impact of monitoring expenses is reported, while activity signs are not obvious.

The last focus of the chapter is on placings priced at premium. It suggests that premium involve more liquid stocks which might facilitate in pricing the shares at higher price. Investors willing to pay premium seem to have self-dealing incentives (Wu and Wang, 2005). Finally, the study provides evidence that investors are indifferent on how they will buy the stock, directly from the company or from the stock market.

Table 4.7: Summary of main findings of chapter four

The first column presents the hypothesis tested, the second the relevant expectations and the third whether the results support the specific hypothesis.

Hypothesis	Prediction for the coefficients to discount or premium	Consistent results	
		Primary	Secondary
H4.1. Certification & uncertainty hypothesis	(+) information asymmetry (-) past-performance (+) return volatility	√ × ×	√ √ √
H4.2. Monitoring hypothesis	Activity signs in descriptive (+) activity variables	?	?
H4.3. Liquidity and inelastic demand	(+) information asymmetry (+) liquidity	√ √	√ ×?
H4.4α. Premium reflects private benefits regardless of the offer type	Insignificant differences between primary & secondary Negative market reactions at the announcement	√ × *(insignificant)*	
H4.4b. Passive investors that pay more for illiquid, riskier and higher asymmetric info stocks pursue private benefits	Opposite signs that do not fall within *H4.1, H 4.2, H 4.3*	√	

Chapter 5 : Incentives around Non pre-emptive Equity Offerings. Good Timing and/or Earnings Management?

5.1. Introduction

This chapter examines the long-run firm performance surrounding non pre-emptive equity offerings. It focuses on the second research objective of the study *(Obj.2)* and provides an answer to the second research question Q2. It thus examines whether the post-offer underperformance is attributed to timing and/or earnings management.

The chapter is organized as follows. Section 5.2 explains the motivation and main contributions of this chapter. Section 5.3 reviews the background and relevant literature, develops testable hypotheses and explains the empirical predictions. Section 5.4 illustrates the research design and methodologies. Section 5.5 describes the datasets and characteristics of the sample, while section 5.6 discusses the empirical findings. Section 5.8 concludes.

5.2. Motivation and main contributions of the chapter

Evidence suggests that firms placing equity privately tend to over-perform their benchmarks the years prior the offer but under-perform the years later (see Hertzel et al., 2002; Barclay et al., 2007). It is in fact typical for issuing firms to under-perform relative to their benchmarks few years after the event irrespective of the offering method.[37] Contrary, firms participating into transactions with blocks of already listed shares are reported to over-perform their benchmarks few years later (Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Phillips, 2000 for US evidence). The

[37] See (among others) US public issues (Spiess and Affleck-Graves, 1995; Mitchell and Stafford, 2000; Loughran and Ritter, 1997); UK rights (Ngatuni et al., 2007; Andrikopoulos, 2009), pre-renounced rights (Armitage, 2007), open offers (Ngatuni et al., 2007; Iqbal et al., 2009), open offers accompanied with a placing (Ho, 2005). Likewise, underperformance is reported for Dutch right issues (Kabir and Roosenboom, 2003), Korean SEO (Yoon and Miller, 2002), Japanese SEO (Cai, 1998) and rights (Kai et al., 1999).

rationale of the over-performance is that, new, corporate and/or affiliate investor joins the firm and becomes active in terms of participating in management. This monitoring activity eventually positively affects the firm value. Similar arguments on US private placements are also reported. Krishnamuthy et al. (2005) and Wruck and Wu (2009) argue that when the investor is affiliated with the firm, he/she is an insider and/or participate into the management after the placement, underperformance is reduced or eliminated. However, the past-performance of secondary offerings is not towards specific direction. Firms chosen by active investors underperform prior the event (Bethel et al., 1998) whereas those chosen for corporate alliances and joint ventures overperform (Allen and Philips, 2000). Different incentives are involved.

This chapter is mainly motivated by two factors. First, the lack of (adequate) evidence with regards to the long-run performance of particular equity offering types for the UK market. Second, contrary to the US evidence that new investors participate that might affect firm policies, investors in UK equity offerings are mainly existing rather than new investors (Armitage, 2010).[38] This provides additional potential interest. Given the arguments that models developed based on US SEO have not been applicable into the UK (Slovin et al., 2000; Korteweg and Reneboog, 2002, Armitage, 2002), investigating the long-run abnormal performance and/or their determinants for the two equity offering types might indicate different findings. On that basis, the contribution of the paper is twofold. It provides new evidence about the performance surrounding UK non pre-emptive placings of equity and explains the performance path based on the UK settings.

More specifically, the few studies investigating long-run performance of UK SEO focus on pre-emptive offers. Armitage (2007) and Andrikopoulos (2009) examine the long-horizon performance following pre-renounced rights and ordinary right issues, respectively. Ngatuni et al. (2007) compare the performance following right and open offers, while Iqbal et al. (2009) examine the performance around open offers. To the best of my knowledge, the only study that investigates long-run stock

[38] Appendix I also identifies the investor identity for the samples used in this study. Additionally, sections 4.6.1.2 and 4.6.1.3 provide evidence on the limited post-offer activity following the two samples.

performance surrounding UK private placings is Ho (2005). However, the sample used is accompanied by open offers. He reports little evidence of post-offer underperformance, as results are sensitive to the long-run *AR* approach used. Further, neither does he examine any factors that might affect the underperformance, nor does he try to explain why the patterns observed. To the degree I am aware of, evidence on the long-horizon abnormal performance surrounding UK secondary placings has not been documented by prior studies.

The main objective of this chapter is to shed some more light on the UK settings regarding SEO. Recall that although in the UK right issues used to be the norm until mid1980's, nowadays placings accompanied with open offers are the most common method (see Barnes and Walker, 2006; Armitage, 2010). Yet, we have the least information about pure placings in comparison with right and open offers. On that basis, the contribution of the chapter is twofold. First, it provides new evidence about the long-run stock and operating performance surrounding pure UK placings. Second, it explains any observed paths by having three main sets of interests which derive by the SEO literature: i) over-optimism, ii) time-varying asymmetric information and iii) earnings quality.

More specifically, prior studies assume that placing firms time the offer when the stock is overvalued, as performance peaks at the offer year and deteriorates afterwards (e.g. Hertzel et al, 2002; Loughran and Ritter, 1997). Expanding prior literature that explicitly advocates for this 'window or opportunity' hypothesis, the current study additionally considers the UK settings into consideration. Following the suggestion of Hellier (2010) that accounting quality in the UK might influence the SEO quality, the study examines whether accounting measures (i.e. trends in real sales growth, cash-flow measures, leverage, operating cash-flows, leverage, debt and capital expenditures) facilitate the firm to signal growth and expectations for value improvements. The analysis reflects corporate fundamentals, whilst it also controls for agency problems that might affect the firm's decision to sell equity (Jung et al., 1996). The management might be truly over-optimistic about the future firm value rather than deliberately sell overvalued stock (given that investors are existing shareholders; Armitage, 2010).

This hypothesis also complies with arguments about time-varying asymmetric information of issuing firms (Lucas and McDonald, 1990; Korajczyk et al., 1991; Dierkens, 1991). Consistent with the earnings quality arguments, it is likely that the management also 'helps' the firm to signal growth by managing accruals the year prior the offer. Given that investors are mainly existing shareholders, such possibility would suggest internal information asymmetries between the management and shareholders. While the literature identifies this possibility for IPO and other SEO, it has not documented similar analysis on (private) placings.[39]

Regarding the secondary offerings, the conventional timing hypothesis of knowingly selling overvalued stock could be valid in UK secondary offers. Often, the members of the management or large shareholders sell due to their disagreement with the incumbent management or because they had personal reasons to do so.[40] The sale is initiated from the sellers point rather than the buyers and thus, managerial activity following the placing is not expected. On that basis, it is likely that the sellers sell the stock at the best convenient time, i.e. when earnings are managed or when the firm signals high performance. This is along the lines of Lee (1997) and Clarke et al. (2004) who argue that US managers sell overvalued stock and identify a window of opportunity, respectively. Marquardt and Wiedman (1998) reports similar incentives regarding US insider trading. However, the secondary sample of this study differs, as it involves sales of block holdings, not insider trading.

The two hypotheses are not mutually exclusive and imply that investors do not realize the real implications of the offerings. They do not receive the stock over-performance prior the offer as temporary or illusionary.

5.3. Hypotheses development and empirical predictions

5.3.1. Window of opportunity

Timing an equity offer has its basic intuition on the information asymmetries between the SEO firm and the market. Insiders are better informed about the future

[39] Among others see Teoh et al. (1998a), Shivakumar (2000), Rangan (1998) for US SEO, Iqbal et al. (2009) for UK open offers and Yoon and Miller (2002) for Korean SEO.
[40] This information is extracted from the news reports used for the sample collection.

firm prospects and attempt to sell (relatively) overvalued stock (as implied in Akerlof, 1970; Myers and Majluf, 1984; Hertzel and Smith, 1993; Wu and Wang, 2005). The management is overoptimistic about private information it possess which is not incorporated to the market prices (yet). The miss-pricing is revealed to the market over time, which leads to long-run post-offer underperformance.

Timing is examined and reported in various ways. Evidence suggests that the managers or sellers choose to sell over-valued stock when a preceding event sends signals that change the level of asymmetric information between the firm and the market. The asymmetric information is reduced, leading to lower adverse selection costs. In other words, there is time-varying asymmetric information (Korajcyk et al., 1992). In that way, the firm avoids larger market reactions at the announcement as the real firm value is disclosed gradually (Korajcyk et al., 1991; Dierkens, 1991). As an example, equity offering announcements follow increased disclosure activities (Lang and Lundholm, 2000), follow information releases related to earnings (Korajczyk et al., 1991) and dividend announcements (Loderer and Maurer, 1992).

Other evidence that support the timing hypothesis documents significant growth or over-performance prior the offer which deteriorates afterwards. More specifically, it is argued that SEO take place at a suitable time of the firm business cycle. A significant relationship of the SEO timing and the business cycle is reported (Choe et al., 1993). Likewise, evidence reports increased firm abnormal performance preceding the offer (Lucas and McDonald, 1990; Loughran and Ritter, 1997; Spiess and Affleck-Graves, 1995; Iqbal et al., 2009), high SEO activity prior the offer (Bayless and Chaplinsky, 1996) and/or increased insider trading (Lee, 1997; Clarke et al., 2004). The increased performance, high activity and insider trading prior the offer are followed by post-offer underperformance relative to several benchmarks few years later (Hertzel et al., 2002; Kang et al., 1999). This implies that the management identified a temporary window of opportunity to sell overvalued stock. Investors overweight the past-stock performance at the expense of the future performance and overreact at the announcement (Hertzel et al., 2002).

Loughran and Ritter (1997) report reversal not only returns but also in earnings for US SEO. They suggest investors are over-optimistic as they expect continuation of

the over-performance. Teoh et al (1998) and Iqbal et al. (2009) report similar consistency between earnings and returns for US and UK public offers and open offers, respectively. On the other hand, Hertzel et al. (2002) reports that the operating performance is constantly negative for US private placings. Regardless of this, they suggest that investors expect earnings to follow the returns pre-offer upwards trend after the placing. For this reason, the market overreacts at the announcement. Thus, even with poor operating performance, investors might be over-optimistic due to the stock growing trends prior the offer. This provides the management incentives to time the offer when the stock is overvalued. On that basis, the first hypothesis examines whether the offer takes place when the stock over-performs.

Nonetheless, investors participating into UK equity offerings are mainly existing rather than new investors (Armitage, 2010). It is thus plausible to argue that if investors overreact, it is not because the management deliberately sold overvalued stock as it is implied by the conventional timing hypothesis. Contrary, it should be due to shareholder over-optimism that the firm policies will lead to improved performance. The study specifically investigates over-optimism hypothesizing that accounting measures beyond earnings such as cash-flows, sales, leverage, debt changes, capital expenditure and R&D facilitate the firm to signal high growth. Adjusting for over-optimism, the first hypothesis assumes that the stock over-performance is associated with growth indicated in the firm financial statements beyond earnings. This growth is expected to reverse during the long-run and be negatively related to the long-run abnormal returns following the offer.

H5.1a: *Primary offers indicate stock over-performance and accounting growth prior the offer which create over-optimism about the future firm performance*

Regarding the secondary placings, evidence also suggests that secondary offerings take place at a time when the stock is overvalued. Marquardt and Wiedman (1998) suggest that sellers in insider trading have incentives to sell the stock when information asymmetries are low: lower levels of asymmetric information help to increase stock liquidity and have fewer costs for the potential buyers. Lower costs could benefit the sellers as the transaction could take place with higher offer price. Likewise, Lee (1997) examines the post-offer performance of firms when top

executives document insider trading prior an SEO. As the firms severely underperform few years later when insiders sell, he concludes that sellers deliberately sell overvalued stock. Clarke et al. (2004) also examines secondary equity issues and suggests that the sellers identify a window of opportunity to sell overvalued stock. The events are timed when SEO activity is high (hot vs. cold periods) and followed by underperformance.

These findings oppose other US findings that report improvement in post-offer performance of block holdings, suggesting post-purchase managerial activities and over-performance (e.g. Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Phillips).

The UK secondary offerings used by this study consist of sales of holdings that are large enough to be announced at the news reports of the LSE. They do not consist of insider trading. However they are associated with announcements that large shareholders decide to sell portion of their holding for various reasons, such as disagreements with the management, expiration of a sale restriction period and personal reasons. They are initiated by the seller rather than the buyer. Thus the second hypothesis is that the sellers will pursue a 'good time' to sell the stock, consistent with the traditional timing hypotheses.

H5.1b: *The sellers of secondary placings identify a window of opportunity to sell overvalued stock.*

Following prior literature, the study assesses the long-run (stock and operating) abnormal performance for the ±3years surrounding the offers. It is expected that the stock performance will peak at the offer time, irrespective of the earnings path.

Beyond stock performance, accounting ratios might also suggest timing. The chapter tests whether over-optimism is pronounced because accounting measures such as earnings, cash-flows, sales and R&D expenditures signal growth. Similar arguments are implied for IPO underperformance which is more pronounced when analysts forecast high growth (Rajan and Servaes, 1997). Loughran and Ritter (1997) also document sales and leverage growth prior SEO in the US. Accounting trends of leverage and debt might also signal needs to raise equity to fund potential investment

opportunities. Overall, if accounting measures are significantly far from zero and significantly related to post-offer underperformance, it would imply that investors are over-optimistic about the future firm value, expecting increase in firm performance. This holds irrespective of the seller being aware of the over-valuation or not.

5.3.2. Earnings management

A different explanation for the reported AR pattern is that, investors might miss-price the stock due to earnings management (e.g. Teoh et al., 1998; Rangan, 1998; Shivakumar, 2000; Kim and Park, 2005; Yoon and Miller, 2002; Iqbal et al., 2009). Evidence suggests that manipulating earnings upwards could signal higher firm quality with lower risk and better future opportunities. This might boost the market prices and help the firm achieve more successful placings. Contrary, downward earnings management could provide tax benefits and/or avoidance of dividend distributions.41 Therefore, motivations to manage earnings could vary. Earnings management is observed in time periods that firms have specific target goals.

Specifically, when SEO firms aggressively manage earnings, they achieve inflated offer prices (Kim and Park, 2005). Teoh et al. (1998) advocate that earnings management predicts the post-offer underperformance in earnings and returns for SEO firms, while Rangan (1998) document significant earnings management the quarters around US equity offerings. Although firms cannot manipulate earnings for long periods, earnings true value would not be revealed immediately after the offer. The earnings reverse during the two quarters following the event (when the earnings management is revealed) and the manipulation could justify the post-offer underperformance. Contrary, Shivakumar (2000) advocate due to the existence asymmetric information, the market expects issuing firms to manipulate earnings. The market cannot distinguish between manipulators and non-manipulators and reacts as if all firms engage earnings management and thus, SEO firms manage earnings to meet the market anticipations. Yoon and Miller (2002) and Iqbal et al. (2009) also report significant earnings management the year prior the Korean SEO and British open offers, respectively.

[41] Bagnoli and Watts (2000) and Dechow and Skinner (2000) report significant associations between management discretion-incentives and firm performance.

Assuming that primary and secondary placings indicate operating performance prior the offer which reverses afterwards (as prior evidence on SEO argue), earnings management would be equally plausible. The earnings management hypothesis assumes that investors fail to recognize the manipulation and miss-value the offered stock. Over the time, the market realises its mistake and corrects. This hypothesis predicts significant earnings management towards a specific direction the year prior the announcement, which can explain the post-offer abnormal performance.

Given that investors in primary placings are mainly existing shareholders (Armitage, 2010), supportive evidence for earnings management would imply information asymmetries between the firm and agency costs. Regarding the secondary placings, earnings management is 'nested' with the timing hypothesis. The management would not manage its accounting items simply because of specific investor's desire to sell. Contrary, a shareholder that has access to information or he/she is informed about the firm financial situation identifies a window of opportunity to sell the stock. The earnings management hypothesis is distinguished into 5.2a and 5.2b, for primary and secondary placings, respectively.

H5.2: *Investors of UK (a) primary and (b) secondary placings are misled as the management opportunistically manages earnings the year prior the offer*

The earnings management hypothesis assumes that investors fail to recognize the manipulation and, miss-value the offered stock. Thus, performance turns negative few years later. The study examines earnings management signs by decomposing accruals based on time and managerial discretion (see Teoh et al., 1998a; b).[42]

According to earnings management, the discretionary current accruals (*DCAC*) the year prior the offer will be significantly far from zero and, will indicate significantly relationship with post-offer *AR*. The study argues that the accrual sings could be either positive or negative, depending on the management specific target. If *DCAC* is significantly positive, it would imply aggressive earnings management. It would thus be expected to be negatively related to the long-run post-offer *AR* (Teoh et al.,

[42] Accruals involve non-cash accounting amounts such as revenue recognition, provisions and depreciation. Non-discretionary accruals are normal accounting adjustments, necessary due to industry and/or firm-specific conditions. Contrary, discretionary are accruals not dictated by firm conditions but consist of accounts that are subject to managerial discretion.

1998a), and vice versa. Long-term discretionary accruals (*LDAC*) also suggest earnings management, while they are also likely to imply agency problems.[43] In case that non-discretionary accruals are significantly far from zero, specific adjustments necessary for the firm operations would be implied. According to Iqbal et al. (2009), significant relation of non-discretionary accruals prior the offer with the post-offer *AR* would support the timing hypothesis.

5.4. Research design and methodological details

5.4.1. Stock abnormal performance

5.4.1.1. Buy-and-hold abnormal [BHAR]

With regards to the stock long-run performance, the study assesses the long-run abnormal returns for ±36 months surrounding the offers. It initially follows a buy-and-hold *AR* approach (*BHAR*) with a single firm-matching approach. This approach reports less biased results with fewer misspecifications on their tests statistics (Barber and Lyon, 1997). BHAR are defined as follows:

$$BHAR_{j,t,T} = \frac{1}{N}\left\{\left[\prod_{t=\tau}^{T}(1+R_{j,t})-1\right]-\left[\prod_{t=\tau}^{T}(1+E(R_{ji,t}))-1\right]\right\} \qquad \text{Eq. 5:1}$$

$BHAR_{j,t,T}$ is the buy-and-hold abnormal return of the placing firm j for a period of ±36 months around the placing. t represents the months within the period tested T and, τ is the start of event window: the 1st day of the month after the announcement or the 36th month prior the event. R_t is the monthly return on the security j (capital gains and dividends) scaled by the market price. $E(R_{ji,t})$ is the expected return defined as the return of a single non-placing matching firm i, over the same period.

To identify the benchmark firms i, all UK companies listed in the LSE are potential matches (available into Datastream Database (DS)). Firms involved into the placing during the years tested are excluded (Jegadeesh, 2000), as well as those belonging to financial sectors (that are usually riskier stocks with high betas). Three benchmark

[43] *DLAC* mainly reflect non-cash expenses associate with fixed assets, such as depreciation and amortization. Hence, significant *DLAC* would imply over or under-investment problems.

firms are chosen, i.e. 1) based on their market value of equity (MV), 2) MV and industry and, 3) MV and book-to-market ratio (BTM).

More specifically, for the MV benchmark, the chosen control firm *i* is the one with the closest to the event-firm MV (DS item MV). The enlarged MV for the primary placings is used, ensuring the new proceeds inclusion (Loughran and Ritter, 1995). For MV and industry control, the chosen benchmark is the non-placing firm with the closest to the event firm MV adding the restriction that both companies participate in the same industry, within the nine main industry sectors (INDM2). For the size and BTM benchmark, the control firm is the one with the closest BTM, restricted to firms with MV within ±30% of that of the placing firm. BTM is defined as in Liu (1999), i.e. book value of equity (equity capital and reserves (305 DS item) minus total intangibles (344 DS item)) divided by the firm MV as at the fiscal year end prior the event. The fiscal year end (FYE) of each firm is used to adjust the fiscal year at which the event belongs. The announcement day is compared with the FYE day within the event calendar year. If the announcement day is before the FYE day, the event is considered as part of the current fiscal year. Otherwise, the event is considered to belong to the next fiscal year.

5.4.1.2. Calendar-time abnormal returns [CTAR]

Fama (1998) and Mitchell and Stafford (2000) argue that BHAR may not adequately account for potential cross-sectional dependence in returns. To address this possibility a calendar-time portfolio approach is also applied. The Fama and French (1993, 1995) three-factor and Carhart (1997) four-factor models are used (hereafter FF-3factor and Carhart-4factor model, respectively). The excess return (over the risk-free rate) of an event portfolio p is regressed against the FF-3factor and Carhart-4factor models, respectively:

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t} \qquad \text{Eq. 5:2}$$

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + p_p PRIYR_t + e_{p,t} \qquad \text{Eq. 5:3}$$

$R_{p,t}$ is the average monthly return on an event portfolio p over the month t. The event-portfolio p is a portfolio formed in order to include the returns of all firms that had been involved to the offering the past 36 months. It is rebalanced every calendar

month. Following inter alia Hertzel et al. (2002), Mitchell and Stafford (2000), the event portfolio is required to include at least 10 firms, to avoid heavy effect of heteroskedastic residuals. The significance of the coefficients is also corrected using the White (1980) test, for the covariance matrix of the regression coefficients.

$R_{M,t}$ is the average return of all firms listed in the LSE at the calendar month t (excluding the firms involved to the event and those belonging into the financial services sectors). $R_{f,t}$ is the risk free rate defined as the 1-month UK Treasury Bill. It is given in annualized percentage form, which needs to be divided by 100 and de-annualized to get the monthly risk-free rate $(R_{f,t} = (1 + \frac{UK.Tbill_{1month}}{100})^{1/12} - 1)$. b_p is the beta of the event-portfolio p, whereas the intercept a_p represents the average abnormal return *(AR)* for the T period tested. A positive intercept would indicate over-performance suggesting the event-portfolio p has performed better than the pricing model, and vice versa.

SMB factor is the value portfolio, measured as the difference between the average returns of the 'small' minus 'big' portfolios, over each month in the period tested. *HML* factor is a growth portfolio, measured as the difference between the returns of 'high' minus 'low' BTM portfolios. SMB and HML are estimated similar to the original six Fama and French (1993) portfolios.[44] *PRIYR* is the Carhart (1997) momentum factor which controls for the positive correlation between *AR* in each period. The pre-event momentum accounts for the timing possibility. *PRIYR* is a 'winners' minus 'losers' portfolio. It takes short position on the stocks that had the highest 30% 11-month returns (lagged 1 month), and long-position on the stocks with the lowest 30% 11-month returns. All portfolios are rebalanced every calendar year to estimate the monthly returns within the 36-month window tested.

[44] At the 1st of July of every calendar year, the population of the companies is sorted in ascending order based on their median MV of equity (price*shares outstanding) into small and big stocks. They are then individually sorted according to their BTM as at the previous year end ($BV_{FY,t-1}/MV_{31/12/t-1}$). They are allocated into low, median and high BTM stocks, having the original cut-off points of 30%, 40%, 30%. The stocks are then allocated to the six portfolios (S/L, S/M, S/H, B/L, B/M, B/H). SMB is the average monthly return of the 3 small minus the 3 big portfolios {(S/L+S/M+S/H)/3-(B/L+B/M+B/H)/3}, whilst HML is the monthly return difference between the 2 high minus the 2 low BTM portfolios {(S/H+B/H)/2-(S/L+B/L)/2}. The portfolios are rebalanced every 12 months. See Michou et al. (2009, Table 5) for other studies that use this classification for the UK market.

Value-weighted portfolios are chosen, as equal-weighted portfolios are sensitive to the firm size and, they are biased towards the performance of small firms (see also Mitchell and Stafford, 2000). In addition, *CTAR* with equal weights ignores the frequency of the events within a month and might not be able to appropriately capture post-offer abnormal performance when the management time the offer at particular periods (see sections 3.4.2 and 3.4.4). As this involves one of the main interests of this chapter, value weighting is preferred.

5.4.1.3. Controls for several biases

As long-run *AR* are subject to various biases (see section 3.4), this sub-section explains the controls taken for more robust inferences. First, recently listed companies are reported to indicate very low *AR* few years after their listing (Ritter, 1991; Loughran and Ritter, 2000; Ritter and Welch, 2002; Brav and Gompers, 1997). This makes new listed firms inappropriate benchmarks, as they will cause upwards bias for the private placements *AR*. To avoid this 'new listing bias', matching companies are required to be listed for the same period before as the event firm or for at least two years before the event whichever is earlier.

Second, matching firms *i*, are likely to disappear/delist before the end of the third year. Thus, data for the period tested disappear through time as well, which will create rebalancing bias. The matching procedure during the tested period should be replicated, to get available data to compute the *BHAR* for the rest of the period. To avoid rebalancing bias, matching firms are required to be listed for three years or at less if the event firm delists before the three-year period tested, whichever is later.

Regarding the delisted returns, they are replaced with the return of a corresponding reference portfolio based on size and BTM, assuming reinvestment at the control portfolio. If for any reason a size and BTM portfolio cannot be chosen, event-delisted returns are replaced with the average (equal or value weighted) return of an industry portfolio. The delisted returns of the control firms that combine the portfolios are purged, similar to Kothari and Warner (1997), Ritter (1991) and others, after the delisted month. As a robustness test, the analysis is replicated by removing the delisted event and corresponding control returns similar to Kothari and Warner

(1997), Ritter (1991) and others, after the delisted month. Results are similar, however with fewer observations (see Table 6.3).

Furthermore, 21% of the placings involve companies that have previously conducted equity offering (primary or secondary) in a period less than three years. As this return overlapping is probably one of the most severe forms of cross-correlation dependence in *AR* (Lyon et al., 1999), previous researchers exclude firms with multiple placings, even when results are reported to be essentially identical to the full sample (see Spiess and Affleck-Graves, 1995). The study follows the Spiess and Affleck-Graves (1995) suggestion (to avoid reducing the observations). As a robustness test, return overlapping controls are also taken. The unit of investigation is each placing, not each firm. Therefore, only one placing from the same company *j* is investigated in each calendar month. When/if the event company *j* gets involved to another placing before the end of the three-year period, the new announcement is considered as a new placing and removed. The results with the alternative treatments can be found in Table 6.3.

Finally, one of the main problems of *BHAR* is the assumption of being independent and normally distributed. Nonetheless, this assumption fails to hold at long horizons, as they are reported to be right skewed and cross-sectional dependent. Barber and Lyon (1997) suggest the single matching-firm approach release *BHAR* from severe skewness and normality biases. Lyon et al. (1999) also suggest that *BHAR* can provide valid inferences when reference portfolios are carefully constructed (free of new listing and survivor biases) and thus, conventional t-tests yield well-specified test statistics (ibid, p.192). Based on this, conventional t-statistic and non-parametric (Wilcoxon) tests are estimated for statistical inference. For robust inferences, the skewness adjusted t-statistic is also employed (Lyon et al., 1999; see Eq. 3:10). Regarding the *CTAR*, it automatically accounts for the portfolio variance. By forming calendar portfolios the cross-sectional dependence of event *AR* is eliminated. Therefore, the distribution is closer to the normal distribution which allows for classical statistical inference (Mitchell and Stafford, 2000).

5.4.2. Operating abnormal performance, growth trends and needs for funds

Similar to the stock performance, operating abnormal performance is examined for ±3 years surrounding the offers. It additionally observes the paths of cash-flows, sales, leverage, debt change, capital expenditures and R&D, always in comparison with a corresponding benchmark. Precisely, the operating performance and accounting proxies are compared to a single non-event firm with similar characteristics (Loughran and Ritter, 1997). The single-control approach is advocated to overcome the mean-reversion tendency of the accounting items (Barber and Lyon, 1996). As a robustness test, average industry benchmarks are also used similar to Teoh et al. (1998b) and Bethel et al. (1998).

It is common that the chosen benchmark firm to the one with the closest operating performance scaled by the book value of assets. As measure of operating performance, previous researchers such as Loughran and Ritter (1997) and Hertzel et al. (2002) use the income before depreciation plus the Interest Income. The interest income is added to control for the possibility that primary equity issuers place funds temporarily into interest bearing instruments, prior investing in operating assets. However, the interest income is not available on DS for several companies of this study. Thus, a measure of *ROA* (return-on-assets) similar to Bethel et al. (1998) is adopted, which equals the *EBITDA/Net Assets*. *EBITDA* is the pre-tax income, adding back the interest expense of debt and depreciation, depletion and amortization and subtracting interest capitalized (WC18198). *Net Assets* is defined as the difference between total assets (WC02999) and total liabilities (WC03351).

Each event firm is matched with a non-event firm that participates in the same industry sector (INDM2) and has the closest EBITDA/Net Assets ratio within a total asset restriction of 25%-200% as at the event fiscal year. The similar but bigger asset size captures the inclusion of the placing proceeds (Loughran and Ritter, 1997). If no matching company meets these criteria, the industry requirement is waived and the assets requirement is adjusted to allow the non-event firm to have ±10% asset size of the event-firm (Loughran and Ritter, 1997). If still there is no matching, the event ratios are compared with the average industry ratios. Four sets of accounting measures are examined.

1.Earnings based ratios: Operating performance is measured via earnings (e.g. Loughran and Ritter, 1997; Franks et al., 2001), defined as the net income before extraordinary items, discontinues operations and preference dividends (WC01551). It is deflated by assets and sales, resulting to return on assets (ROA) and return on sales (ROS). The former ratio has the ability to measure productivity; when scaling by assets, the performance is measured as percentage of firm investments into operating and non-operating assets. When scaling by sales, the performance is presented as percentage of firm revenues, which does not directly measure productivity. However, the ratio is more appropriated matched, as both (earnings and sales) come from the income statement (Barber and Lyon, 1996). The ROS indirectly accounts for the sales trend.[45]

2. Cash-Flow based ratios: Cash-based measures are appropriate in cases where management might have incentives to manipulate operating items to report better operating performance (Barber and Lyon, 1996). Additionally, cash flow ratios capture accounting liquidity and the need to raise equity. Evidence suggests that the negative post-SEO long-run *AR* is related to increased free-cash flow problems following the event (Lee, 1997; McLaughlin et al., 1996; Jung et al., 1996) and/or earnings management (e.g. Teoh et al., 1998; Iqbal et al., 2009). Wu and Wang (2005) also suggests that increased financial slack (internal funds) aggravates over-performance. Operating cash flows (WC04860) is scaled by both, total assets and sales (*CFA* and *CFS*, respectively).

3. Growth ratios: Growth ratios might indicate future firm potentials and expectations for value improvements. Following Lang et al. (2006) turnover ratios are used to measure growth in operations such as sales on assets (*SALES*) and percentage of sales change (*SGTH*). Furthermore, capital expenditure and *R&D* could reveal attempts to change firm policies or future plans/strategies. It could then imply potential capital investments and future growth. Additionally, it is likely that the placing proceeds cover capital expenditures and *R&D* expenses, suggesting the

[45] Variations of operating measures used by the literature are several accounting items such as return on assets (ROA), return on sales (ROS), return on market value of assets, return-on-equity (ROE), Tobin's-Q, profit margins, market-to-book (MTB), earnings per share (EPS) depending on the research questions. For more details please see Healy and Palepu (1990), Barber and Lyon (1996), Loughran and Ritter (1997), Hertzel et al. (2002), Bethel et al. (1998), Megginson et al. (1994), Jain and Kini (1994), Hanson and Song (2003), and others.

purpose of a private placing. Following Hertzel et al. (2002) and Loughran and Ritter (1997) a similar ratio *ACTV* is estimated, where the sum of capital expenditures (WC04601) and *R&D* expenses (WC01201) is scaled by the total assets.

4. Leverage and debt characteristics: Finally, the capital structure of the company might conceal financial needs to raise equity (Franks et al., 2001). Debt levels might also indicate the incentives to sell equity. It is well documented that firms will prefer debt to fund a positive NPV project. They will choose equity if leverage is already high to the extent that the firm can no longer issue riskless debt (the pecking order model; Myers, 1984). Alternatively, regardless of the debt level, a negative NPV project that would not add value to the firm will be funded by equity (Jung et al., 1996) (as the present value of the new debt will exit the present value of the project output). Therefore, observing the debt levels might reveal different incentives including the possibility that managers seek to maximize their own wealth. Additionally, firms with high debt or changes in leverage may manage earnings to avoid debt covenants (Defond and Jiambalvo, 1991). To investigate these issues, two proxies are used: debt-to-equity ratio (LEVR) and change in debt (ΔDEBT%). LEVR is the total debt (long-term and short-term debt; WC03251 and WC03051) to book-value of equity (DS 305). ΔDEBT% is its percentage change.

5.4.3. Earnings management

To examine the earnings management hypothesis, accruals are decomposed on time and management choice, as in Teoh et al. (1998b). Total accruals (TAC) is the difference between net income and operating cash flows

$$TAC_t = NI_t - OCF \qquad \text{Eq. 5:4}$$

TAC_t are decomposed based on time into current and long-term accruals, and based on managerial discretion into discretionary and non-discretionary. Current accruals (CAC) are adjustments in the working capital accounts (in short-term assets and liabilities). As examples of such adjustments, consider the conservative/aggressive recognition of revenues and/or expenses, provision for bad and doubtful debts and inventory valuation. Contrary, long-term accruals (LAC) are adjustments in accounts that involve fixed assets and long-term liabilities. Such amounts could be altered by

revaluation of reserves, depreciation methods, deferred taxation, realization of unusual gains/losses.

Current accruals (CAC) is the change in noncash current assets minus the change in operating current liabilities, while LAC are simply the difference between TAC and CAC:

$$LAC_t = TAC_t - CAC_t = TAC_t - [\Delta(CA_t - Cash_t) - \Delta(CL_t - STD_t)] \qquad \text{Eq. 5:4}$$

ΔCA_t is the change in current assets (WC02201) as at the fiscal year t; ΔCL_t is the change in current liabilities (WC03101); $\Delta Cash_t$ the change in cash and equivalents (WC02001); ΔSTD_t the change in current debt included in current liabilities (WC03051) and Dep_t the depreciation and amortization expense (WC01151). In sequence, CAC and LAC are decomposed into discretionary and non-discretionary. Therefore, four groups for accruals are used: discretionary current accruals (DCAC), non-discretionary current accruals (NDCAC), discretionary long-term accruals (DLAC) and non-discretionary long-term accruals (NDLAC).

To discriminate between discretionary and non-discretionary accruals, the cross-sectional modification of Jones (1991) is adopted, where current accruals are a linear function of the change in sales. To estimate the NDCAC for the event firm j (as at the fiscal year t), all firms in the same industry (INDM2) as the equity offering firm are used, but excluding the offering firm itself. The industry cross-sectional current accruals i $(CAC_{i,t})$ are regressed over the industry change in sales $(\Delta Sales_{i,t})$ for the fiscal year t. All regression variables (including the regression intercept) are deflated by the previous year total assets $(TA_{i,t})$ to reduce heteroskedasticity.

$$\frac{CAC_{i,t}}{TA_{i,t-1}} = a_0\left(\frac{1}{TA_{i,t-1}}\right) + a_1\left(\frac{\Delta Sales_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \qquad \text{Eq. 5:5}$$

The estimated coefficients $\hat{a}_0, \hat{a}_1$ constitute an 'industry benchmark' in the sense that they capture the industry loadings. They are used to estimate the non-discretionary current accruals of the equity firm j at year t, $\left(\frac{NDCAC_{j,t}}{TA_{j,t-1}}\right)$, by replacing the $\hat{a}_0, \hat{a}_1$ in Eq. 5:6, modified as suggested by Dechow et al. (1995):

$$\frac{NDCAC_{j,t}}{TA_{j,t-1}} = \hat{a}_0\left(\frac{1}{TA_{j,t-1}}\right) + \hat{a}_1\left(\frac{\Delta Sales_{j,t} - \Delta \text{Re}ic._{j,t}}{TA_{j,t-1}}\right) \qquad \text{Eq. 5:6}$$

$\Delta Sales_{j,t}$ is the corresponding sales change of the placing firm *j*, at year *t*. $\Delta \text{Re}ic_{j,t}$ is its change in accounts receivable. $\Delta \text{Re}ic_{j,t}$ allows for manipulation of credit sales by the equity offering firm to document high revenues prior the offer. Thus, $NDCAC_{j,t}$ capture the expected (estimated) *CAC* based on the industry standards. The difference between the actual event-firm $CAC_{j,t}$ and the estimated $NDCAC_{j,t}$ (as estimated in equations 5.6 and 5.7 respectively) is the discretionary current accruals $DCAC_{j,t}$ (all scaled by $TA_{j,t-1}$) for the year *t*:

$$DCAC_{j,t} = CAC_{j,t} - NDCAC_{j,t} \qquad \text{Eq. 5:7}$$

Discretionary and non-discretionary long-term accruals $(DLAC_{j,t}, NDLAC_{j,t})$ are measured in similar way. The differences are the addition of the gross property plant and equipment $(GPPE_t)$ as an independent variable (which accounts for the long-run accruals such as depreciation) and, the use of total accruals (TAC_t) rather than CAC_t as the dependent variable.

$$\frac{TAC_{i,t}}{TA_{i,t-1}} = b_0\left(\frac{1}{TA_{i,t-1}}\right) + b_1\left(\frac{\Delta Sales_{i,t}}{TA_{i,t-1}}\right) + b_2\left(\frac{GPPE_{i,t}}{TA_{i,t-1}}\right) + \varepsilon_{i,t} \qquad \text{Eq. 5:8}$$

The estimated non-discretionary total accruals of the event firm *j* $\left(\frac{NDTAC_{j,t}}{TA_{j,t-1}}\right)$ derive from the replacement of the estimated regression coefficients $\hat{b}_0, \hat{b}_1, \hat{b}_2$ in the modified Eq. 5:9:

$$\frac{NDTAC_{j,t}}{TA_{j,t-1}} = \hat{b}_0\left(\frac{1}{TA_{j,t-1}}\right) + \hat{b}_1\left(\frac{\Delta Sales_{j,t} - \Delta \text{Re}ic_{j,t}}{TA_{j,t-1}}\right) + \hat{b}_2\left(\frac{GPPE_{j,t}}{TA_{j,t-1}}\right) \qquad \text{Eq. 5:9}$$

The difference between total $(TAC_{j,t})$ and non-discretionary total accruals $(NDTAC_{j,t})$ is the discretionary total accruals $(DTAC_{j,t})$. Hence, the discretionary long-term accruals $(DLAC_{j,t})$ and non-discretionary long-term accruals $(NDLAC_{j,t})$ are easily estimated, as being the difference between the total and current discretionary and non-discretionary current accruals.

$$DLAC_{j,t} = DTAC_{j,t} - DCAC_{j,t} \quad \text{Eq. 5:10}$$

$$NDLAC_{j,t} = NDTAC_{j,t} - NDCAC_{j,t} \quad \text{Eq. 5:11}$$

As the earnings management hypothesis predicts significant discretionary accruals the year prior the offer, this procedure is repeated for all event firms, for the years (-1, +1) around the event.

5.5. Sample characteristics

This chapter uses the two sets of non pre-emptive equity offerings publicly announced during the period 01/1998-06/2006 (as in Chapter 4). Table 5.1 presents some descriptive statistics, after distinguishing the placings based on whether the relative offer size exceeds the 5% of the share capital (panels B and C respectively).

5.5.1. Private placements

The primary placings below the 5% cut-off point place approximately 3% of the firm share capital, while the conventional placing firms (at least 5% of the share capital) offer about 20% - 28% (few cases are subject to reorganisations, which cause large deviation in the shares placed; see section 4.5).

Regarding the placings below the 5% cut-off, they indicate a mean (median) market value of 5385 (387) millions, contrary to the 239 (24) millions of the conventional placing type. The fact that firms placing smaller portions of their capital are such large firms suggests lower asymmetric information compared to the conventional SEO placing types and contradicts the traditional view that firms placing shares are very small stocks. In fact, several small placings below the 5% of their capital take place at London Stock Exchange. Nevertheless, little information is provided with regards to their characteristics and implications. Likewise, small offers involve older firms, listed for approximately 11 (7) years. This is significantly higher from the age of the conventional placings that are younger, listed for about 7 (3.5) years. The discount offered by these smaller placings is however about half, 7% (4%) vs. 12% (8%). All the differences are statistically significant at the 5% and 1% levels, suggesting lower asymmetric information.

Although not tabulated in Table 5.1, these small placements (in relative offered size) often follow other announcements, e.g. to acquire another firm or other big investment plans. This fact is in line with the view that investment opportunities might drive the placings or signal growth. It is also consistent with the view that they raise equity to fund their investment opportunities. They might also impose different incentives to manage earnings.

Table 5.1: Descriptive statistics

Gross proceeds represent the size of the placing in actual amounts, in millions of GBP (shares placed * placing price). MV is the firm market value, defined as the price multiplied by the shares outstanding (DataStream Item MV). age is the years since the corporation listing. The gross proceeds as percentage of the firm market value reflects the placing value and the number of the shares placed as percentage of the share capital reflects the placing size.

	Mean	Median	St.Dev	Mean	Median	St.Dev
Panel A: Descriptive statistics - full samples						
	Primary placings (N=230)			*Secondary placings (N=123)*		
Firm MV (£millions)	1492	34	9748.1	5323.6	814.2	22165
Firm age (years)	7.97	3.83	9.68	12.24	6.67	12.91
Gross Proceeds (£millions)	73.01	6.95	374.4	185	59	408.8
Gross Proceeds/MV	0.60	0.12	5.86	0.20	0.07	0.70
Shares Placed /Sh.Cap.	0.21	0.15	0.20	0.12	0.08	0.12
Discount	0.11***	0.07***	0.18	0.04***	0.03***	0.10
Panel B: Placings at least 5% of the share capital						
	Primary placings (N=174)			*Secondary placings (N=87)*		
Firm MV (£millions)	238.9	23.51	844.4	1411.7	522.3	3154.2
Firm age (years)	6.94	3.5	8.91	10.11	4.42	12.06
Gross Proceeds (£millions)	55.8	6.7	332.0	149.4	57.7	309.2
Gross Proceeds/MV	0.79	0.18	6.73	0.27	0.11	0.82
Shares Placed /Sh.Cap.	0.27	0.20	0.20	0.16	0.13	0.12
Discount	0.12***	0.08***	0.20	0.05***	0.03***	0.09
Panel C: Placings below the 5% of the share capital						
	Primary placings (N=56)			*Secondary placings (N=36)*		
Firm MV (£millions)	5385.4	386.7	19313.5	12347.2	2909.1	36017.8
Firm age (years)	11.16	7.00	11.42	17.08	12.46	13.71
Gross Proceeds (£millions)	126.44	7.10	482.5	272.98	65.7	580.2
Gross Proceeds/MV	0.03	0.03	0.02	0.028	0.022	0.021
Shares Placed /Sh.Cap.	0.03	0.04	0.02	0.023	0.019	0.014
Discount	0.07***	0.04***	0.14	0.04**	0.03***	0.12
Panel D: Sub-sample differences						
Firm MV (£millions)	-5146.5*	-363.2***	-18469.1	-10935.4*	-2387***	-32863.5
Firm age (years)	-4.2***	-3.5***	-2.52	-6.98*	-8.04***	-1.66
Gross Proceeds (£millions)	-70.64	-0.40	-150.50	-123.58	-8.00	-270.96
Gross Proceeds/MV	0.76	0.14***	6.71	0.24***	0.09***	0.80
Shares Placed /Sh.Cap.	0.24***	0.17***	0.21	0.14***	0.11***	0.10
Discount	0.05**	0.04**	0.06	0.01	0	-0.02

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

5.5.2. Blocks of listed shares

Secondary placings involve existing blocks of shares sold, initiated by one or more existing shareholders. Recall that secondary placings involve mainly larger firms in comparison with the primary sample (see section 4.5.2). Additionally, they are listed for more years and offered at about half discount. On that basis, as they are subject to lower asymmetric information, the long-run abnormal performance of the firms involved is likely to be closer to zero. This lays on the assumption that the stock is already assessed by the market (as implied by Lee, 1997).

Comparing the placings based on the relative offer size, the small offerings below the 5% cut-off point are about 3% of the corporation shares outstanding. Contrary, the bigger offers (of at least 5%) involve approximately 27% (11%) of the firm. Similar to the primary placings, the firms with smaller relative offer size are mainly the biggest ones. They indicate mean (median) market value of 12 (3) billions, contrary to 1.4 (0.5) billions of the larger placings. Likewise, they are listed for approximately 17 (12) years, contrary to the 10 (4) years of stocks with larger relative offer size.

As the differences between the firm characteristics based on the relative offered size are significant, it becomes apparent that the smaller placings involve firms with even lower asymmetric information. The incentives or reasons to sell larger portions of the firms are possibly stronger when the offering is above the 5%. Regardless, the two sub-samples are priced similarly, at a discount of about 3%-5%.

5.6. Findings and discussion

5.6.1. Long-horizon abnormal stock performance

According to the timing and over-optimism hypotheses, the event stock performance will peak at the offer time and deteriorate afterwards, irrespective of the earnings path. Figure 5.1 and Figure 5.2 graph the *BHAR* paths on annual basis, for primary and secondary placings respectively. As the figures clearly indicate, the performance of the offered firms significantly increases the year prior the offer and deteriorates the year after, consistent with the over-optimism/timing hypothesis.

Figure 5.1: Stock abnormal performance surrounding primary placings

The graph presents annual *BHAR* of the primary placings. *BHAR* are estimated as described in Table 5.2, using the three benchmarks (size, size and industry, size and BTM).

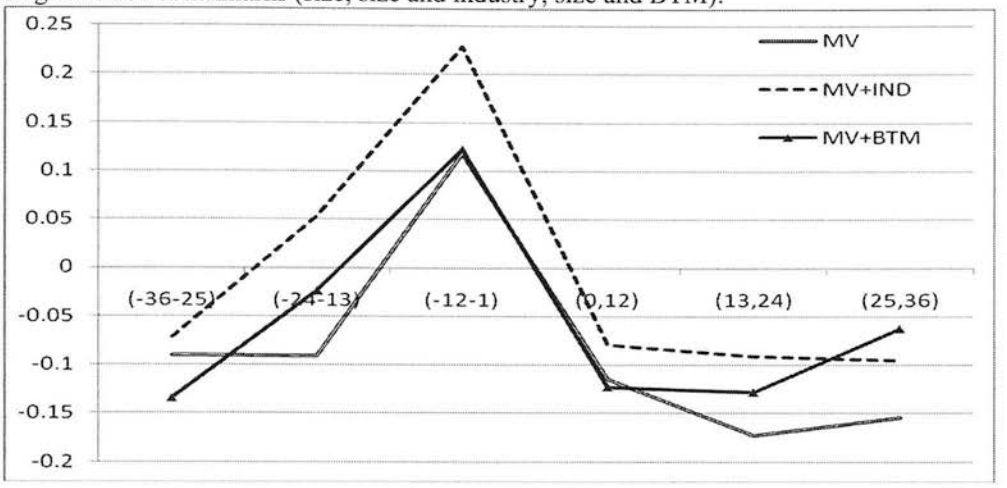
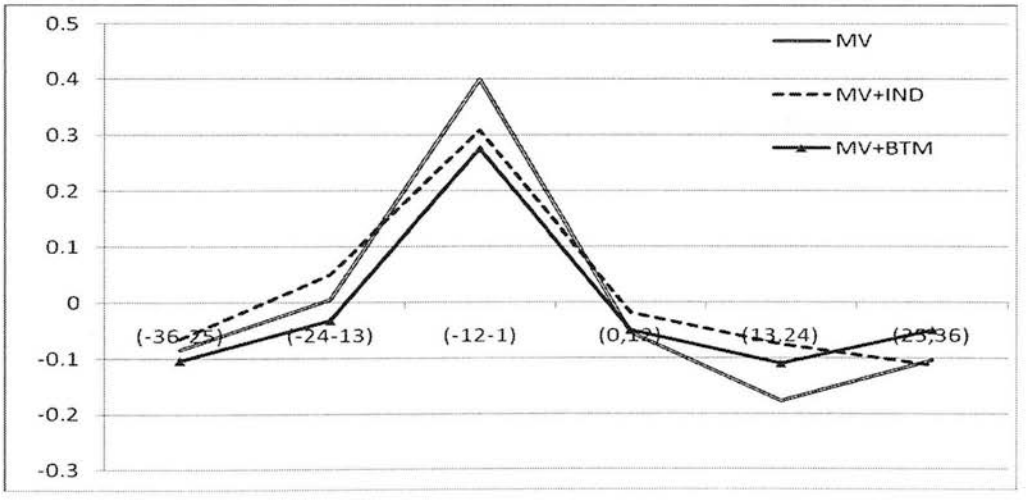


Figure 5.2: Stock abnormal performance surrounding secondary placements

The graph presents annual *BHAR* of the secondary placings. Three non-event matching firms are used as benchmarks, chosen based on similar size, size and industry, size and BTM characteristics. *BHAR* are estimated as described in Table 5.2.



For simplicity, Table 5.2 presents the *AR* for the year prior the offer t=-1 and for three years following the event.

5.6.1.1. Primary placings

According to Table 5.2 the mean (median) *BHAR* of primary placings for the year prior the offer under each of the three different benchmark firms chosen (i.e. based on the event market value, market value and industry, and market value and book-to-market) is about +13% (+0.3%), + 23% (+10%) and +13% (9%) respectively (see panel A). The *BHAR* are significantly positive under all statistical tests, i.e. the

conventional t-test, skewness adjusted t-test (Lyon et al., 1999) and Wilcoxon z-value. Regarding the *CTAR* (panel B), the past-offer performance appears normal, irrespective of the benchmark (FF-3factor or Carhart-4factor model). The average monthly *AR* during the 12 months before the offer is positive, approximately by 0.4% and 0.2%. This translates to 5% and 2% over the 12 months tested $[(1+intercept)^{12}-1]$, respectively. However it is not significantly different from zero. Given the significant strong *BHAR* but the insignificant positive *CTAR*, someone could argue that *CTAR* might not be completely able to detect abnormal performance, as the intercepts are assumed to be constant (but samples cluster by calendar time or industry), yielding misspecified test statistics (Lyon et al, 1999; see section 3.4.2).

Nonetheles, the positive (or normal) performance the year prior the offer turns significantly negative three years after. The mean (median) *BHAR* under each of the three different benchmark *MV, MV+Ind*, and *MV+BTM* is -41% (-16%), -26% (-12%) and -30.2% (-18%), respectively. The *BHAR* is highly significant under all statistical tests applied. Likewise, *CTAR* lead to similar conclusions (panel B). The primary placing firms underperform on average by -2.8% for every month during the 36 month period tested under the FF-3factor and Carhart-4factor models. This is translated to -63% loss over the total period tested after being compounded at the same rate of return (the intercept) for 36 months $[(1+intercept)^{36}-1]$. The intercept is statistically significant at the 5% level.

As a conclusion, primary placings overperform their benchmarks or indicate normal performance the year prior the offer. Nevertheless, they significantly underperform afterwards. This pattern is inconsistent with Ho (2005) who reports little evidence for post-offer underperformance following UK placings. It is however in line with international evidence on private placements (Hertzel et al., 2002; Barclay et al., 2007; Kang et al., 1997) and support the over-optimism hypothesis *(H5.1)*.

Table 5.2: Long-horizon abnormal returns

Panel A presents the buy-and-hold *AR* (*BHAR*), for a period of ±3 years around the event. They are assessed on a monthly basis for the months (-35, -1) and (0, +36) around the announcement. *BHAR* on each event firm *j*, equals the difference between its BHR_j and the *BHR* of a benchmark non-event firm $E(BHR_i)$, over the same period of time. Benchmark firms are chosen based on their market value of equity, market value and industry and, market value and BTM value: $BHAR_{j,t,T} = \left[\prod_{t=\tau}^{T}(1+R_{j,t})-1\right] - \left[\prod_{t=\tau}^{T}(1+E(R_{i,t})-1\right]$. R_t is the monthly stock return. It equals the monthly price return adjusted for dividend payments granted within the month *t*, scaled by the market price P_t. P_t is the adjusted market (closing) price as at the 1st day of each month included in the event window (DS item *P)*. Panel B present the value-weighted calendar-time *AR* using the FF-3factor model (Fama and French,1993) $\{R_{j/p,t} - R_{f,t} = a_{j/p} + b_{j/p}(R_{M,t} - R_{f,t}) + s_{j/p,t}SMB + h_{j/p,t}HML + e_t\}$ and Carhart-4factor model (Carhart, 1997) $\{R_{j/p,t} - R_{f,t} = a_{j/p} + b_{j/p}(R_{M,t} - R_{f,t}) + s_{j/p,t}SMB + h_{j/p,t}HML + p_{j/p,t}PRIYR + e_t\}$, respectively. $R_{j/p,} - R_f$ is the event excess return , regressed against the two models. $R_{M,t}$ is the market return at the calendar month *t*, $b_{j/p}$ is the beta of the even–portfolio *p*. *p* includes the stocks that have been involved to the private placing in the previous *t* months tested. The intercept $\alpha_{j/p}$ represents the average *AR* for the period tested . *SMB* factor is the value portfolio (average returns of the 'small' minus 'big' portfolios), *HML* factor is a growth portfolio ('high' minus 'low' growth portfolios) and *PRIYR* is the Carhart (1997) momentum factor defined as the difference between the 'winners' minus 'losers'. Following Hertzel et al. (2002), the implied *BHAR* is the intercept buy-and-hold return from the holding period tested, i.e $[(1+AR)^t-1]$. To control for severe heterocedasticity each event portfolio includes at least 10 event-firm returns.

	PRIMARY PLACINGS						SECONDARY PLACINGS					
Months around the announcement	*(-12,-1)*	*(0,+36)*	*(-12,-1)*	*(0,+36)*	*(-12,-1)*	*(0,+36)*	*(-12,-1)*	*(0,+36)*	*(-12,-1)*	*(0,+36)*	*(-12,-1)*	*(0,+36)*
Panel A: Full Sample												
	BHAR (MV)		*BHAR (MV+Ind)*		*BHAR (MV+BTM)*		*MV*		*MV+Ind*		*MV+BTM*	
Obsv	225	229	222	228	223	228	123	124	120	123	123	124
Mean	0.118	-0.407	0.228	-0.258	0.130	-0.302	0.400	-0.329	0.308	-0.149	0.266	-0.188
Median	0.003	-0.156	0.100	-0.123	0.090	-0.179	0.097	-0.230	0.121	-0.119	0.042	-0.124
[convensional t-test]	[1.766]*	[-4.136]***	[3.790]***	[-3.820]***	[2.018]**	[-3.903]***	[4.377]***	[-2.00]**	[3.679]***	[-1.904]*	[2.986]***	[-1.872]*
[skewness adj. t-test]	[1.741]*	[-5.911]***	[4.303]***	[-4.175]***	[2.105]**	[-4.137]***	[5.488]***	[-2.283]**	[4.178]***	[-1.920]*	[3.263]***	[-2.242]**
[Wilcoxon z-value]	[1.291]	[-4.632]***	[3.014]***	[-4.207]***	[1.362]***	[-3.844]***	[3.269]***	[-3.155]***	[3.022]***	[-2.002]**	[2.256]**	[-2.127]**
	FF -3 factor		*Carhart - 4 factor*				*FF -3 factor*		*Carhart - 4 factor*			
Panel B: Calendar-time abnormal returns (Value Weighted)												
Months	123	113	123	113			111	105	111	106		
R^2	0.115	0.434	0.116	0.435			0.235	0.462	0.235	0.534		
Intercept	0.004	-0.028	0.002	-0.027			0.006	-0.017	0.006	-0.020		
Implied BHAR	0.045	-0.646	0.021	-0.633			0.073	-0.451	0.078	-0.522		
[intercept t-statistic]	[1.00]	[-2.34]**	[0.30]	[-2.31]**			[1.64]*	[-3.07]***	[0.369]	[-3.65]***		

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively.

5.6.1.2. Secondary placings

As far as the secondary placings is concerned, the results are similar. The mean (median) *BHAR* for the year prior the offer under each of the three different benchmarks *MV, MV+Ind*, and *MV+BTM* is 41% (9.7%), 31% (12%) and 26.6% (4.2%), respectively. The three statistical tests suggest significance at the 1% and 5% levels. Regarding the *CTAR*, both FF-3factor and Carhart-4factor models document over-performance during the months (-12-1) prior the event, of approximately 0.6% per month. This translates to approximately 7.3% over the year prior the offer, assuming re-investment at the intercept for 12 months $[(1+intercept)^{12}-1]$. This over-performance is statistically significant under the FF-3factor model, at the 10% level.

The performance prior the event is followed by significantly strong under-performance. The *BHAR* are significantly negative under the three different benchmarks. Specifically, the mean (median) *BHAR* under the *MV, MV+Ind*, and *MV+BTM* benchmarks are -33% (-23%), -15% (-12%) and -19% (-12.4%), respectively. Likewise, the *CTAR* indicates negative post-placing performance. The monthly *AR* is -1.7% and -2% under the FF-3factor and Carhart-4factor models, respectively (panel B). This translates to -45% and -52% holding period *AR*, assuming reinvestment at the intercept rate for 36 months. It is statistically significant at the 1% level.

These findings do not support the literature regarding secondary placings and value improvements (Barclay and Holderness, 1991; Bethel et al., 1998). Contrary, the findings are in line with Lee (1997) who report underperformance when top executives sell before an SEO. They are consistent with the view that the sellers identify a window of opportunity to sell overvalued stock (Lee, 1997; Bayless and Chaplinsky, 1996). Hence, the stock performance of secondary offerings gives support to the timing hypothesis (H5.1b).

5.6.2. Operating performance & trend of accounting items

Accounting ratios might also suggest overvaluation. Based on the predictions of the corresponding hypothesis, accounting measures are to indicate significant growth prior the offer. This would imply that investors are over-optimistic about the future firm value at the time of the offer, expecting increase in firm performance. Table 5.3 examines the relevant possibility.

5.6.2.1. Primary placings

Panel A presents the findings for the primary placings. The ROA is significantly negative at the year t=-2 prior the offer, however it is normal at the year t=-1. In fact, both ROA and ROS are normal the year prior the offer, the event year and the following year (-1, +1). This is inconsistent with the stock performance which documents significant growth the years before, mainly the year prior the placing. However, the ROA becomes negative the years +2 and +3 following the placing, consistent with the negative stock underperformance. Therefore, the operating abnormal performance turns negative after the offer. These paths differ from Hertzel et al. (2002) that document significantly negative ROA during all years surrounding US private placings. Despite of this, the ROA (and ROS) paths give support to the view that the market overvalues the stock in comparison with its operating performance prior the offer.

In addition, the cash flow based performance (CFA and CFS) follow similar past-offer performance. CFA is significantly negative two years before the placing (t=-2), while both CFA and CFS are normal at t=-1. Interestingly, CFA becomes significantly negative during all the years afterwards, i.e. from the event year to three years later (0, +3). Therefore, this suggests that primary issuers face free cash-flow problems (Lee, 1997; McLaughlin et al., 1996; Jung et al., 1996).

The free cash-flow interpretation is also consistent with the debt growth. The ΔDEBT is significantly higher from the benchmark firms by approximately 1% the year prior the offer t=-1 and increases to 14% and 18% during the years 0, +1, +2. This implies need for the placing funds. It might have been difficult for the firm to raise debt without increasing the firm's cost of debt (and cost of capital). This is

suggested by the normal leverage documented by the last column of the table. This interpretation is in line with the pecking order model about choices between equity and debt (e.g. Myers, 1984; Myers and Majluf, 1984).

Consistently, the sales turnover is significantly negative in all years surrounding the offer. SALES is about -16.5% lower from the corresponding benchmark the years t=-3, -1, 0 and about -30% in t=-2. Nonetheless, this gap from the benchmark firms is reduced to -7% after the equity placing indicating improvement in sales. Indeed, the sales growth (SGTH) is significantly higher for the year prior the offer, the offer year and the year after (-1, +1) by 12%, 8% and 14% respectively.

Overall, it appears that operating performance is normal prior the offer but deteriorates afterwards. In addition, the firms indicate liquidity needs. While the leverage is normal, the debt and sales growth significantly increases from the year prior the equity issue and onwards. These amounts might signal growth efforts that raise expectations for the future performance improvements, leading investors to over-optimistic reactions at the announcement. Figure 5.3 plots the time-series of these significant accounting measures.

Figure 5.3: Trend of accounting items for primary placings

The graph presents the operating performance measures *ROA* and *CFA* for the primary placings. It also presents growth measures such as *SGTH, TURNV, DEBT* and *ACTV* as defined in Table 5.3.

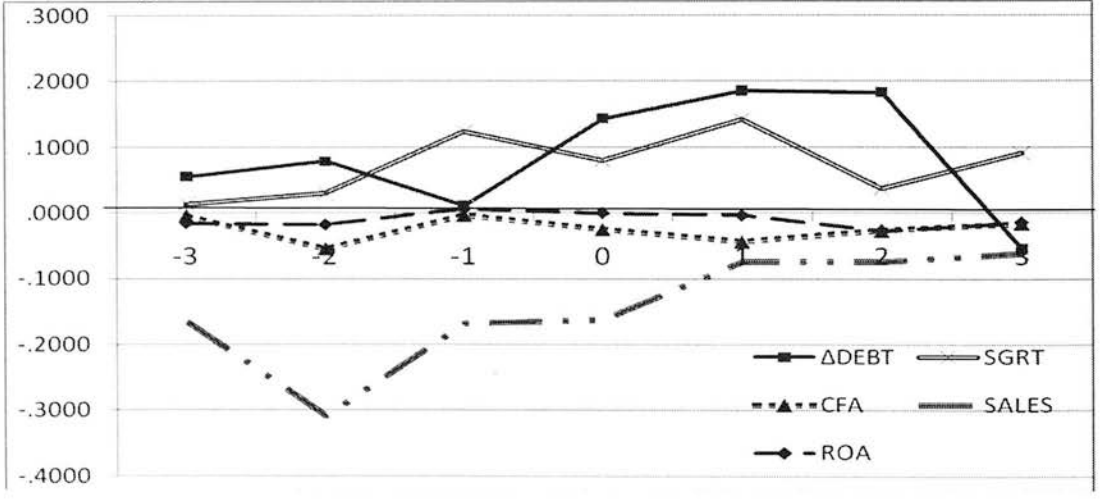


Table 5.3: Operating abnormal performance and other accounting information

The table presents abnormal accounting ratios for the years ±3 around the event, i.e. the difference between the event firm ratio minus the benchmark ratio. Benchmark is a chosen non-event firm that participates in the same industry sector (DataStream INDM2) and has the closest *EBITDA/Net Assets* ratio, within the total asset size restriction of 25% - 200% as the fiscal year end prior the event. If no matching company in the appropriate industry meets these criteria, the industry requirement is waived and the assets requirement is adjusted to allow the non-event firm to have asset size within 90% - 110% of the event-firm assets. If still there is no matching, the event firm ratios are compared with the average industry ratios. ROA_t and ROS_t are the Return-On-Assets and Return-On-Sales, defined as the Net Income before extraordinary items, discontinues operations and Preference Dividends (WC01551) scaled by the firm total assets (A_t=WC02999) and Sales (S_t=WC 01001), respectively. *CFA* and *CFS* are the operating cash flows (OCF_t =WC04860) scaled by the total assets and sales, respectively. *SALES* is the sales of year scaled by total assets and *SGTH* the percentage change in sales. *ACTV* measures the capital expenditures (WC04601) plus research and development expenses (WC01201), scaled by the total assets. *LEVR* is the total debt (Long+Short term debt; WC03251+WC03051) as a percentage of the book value of equity (equity capital and reserves). $\Delta DEBT$ is the percentage change in total debt. All values are winzorized at the 1st and 99th percentiles. Wilcoxon test examine the null hypothesis of zero abnormal ratio medians.

		Earnings		Cash-Flows		Growth			Debt	
FY relative to the offer		ROA	ROS	CFA	CFS	SALES	SGTH	ACTV	ΔDEBT	LEVR
Panel A: Primary placings, full samples (Event - Benchmark)										
-3	N	88	90	169	154	189	160	89	150	190
	Median	-0.016	0.010	-0.004	-0.002	-0.165***	0.014	-0.003	0.055	0.000
-2	N	117	116	194	186	210	186	115	181	209
	Median	-0.018***	0.003	-0.054***	0.027	-0.308***	0.029	-0.013	0.078	0.000
-1	N	134	134	198	184	217	188	139	186	214
	Median	0.007	0.037	-0.003	0.023	-0.168***	0.123***	-0.007	0.011*	0.000
0	N	150	148	202	195	214	197	148	189	211
	Median	0.000	0.009	-0.025**	0.000	-0.163***	0.08**	-0.01*	0.143**	0.000
1	N	136	134	201	190	212	193	139	185	214
	Median	-0.004	0.008	-0.044**	-0.022	-0.074***	0.142**	-0.002	0.185***	0.012
2	N	120	118	202	191	207	192	121	189	212
	Median	-0.027***	-0.029**	-0.023*	-0.023*	-0.074***	0.037	-0.005	0.183***	0.000
3	N	102	100	167	149	177	155	99	138	188
	Median	-0.014**	0.016	-0.016**	-0.004	-0.062**	0.09**	0.004	-0.054	0.000

FY relative to the offer		Earnings		Cash-Flows		Growth			Debt	
		ROA	ROS	CFA	CFS	SALES	SGTH	ACTV	ΔDEBT	LEVR
Panel B: Secondary placings (Event - Benchmark)										
-3	N	64	62	90	85	96	87	61	86	97
	Median	0.012	0.005	-0.003	0.038	-0.022	-0.001	-0.014	0.045	-0.045
-2	N	74	75	103	98	112	102	82	98	108
	Median	0.004	0.026	0.018	0.052***	-0.077**	0.004	-0.016	-0.079	0.064
-1	N	84	84	108	105	117	108	90	101	114
	Median	0.002	0.045***	0.012	0.073***	-0.08*	0.023	-0.003	-0.064	-0.004
0	N	86	88	115	110	118	112	82	112	115
	Median	0.007	0.015	0.031	0.018	-0.108*	0.048	-0.001	0.005	0.007
1	N	77	79	108	99	110	103	74	93	108
	Median	0.001	0.016	-0.017	0.021	-0.064	0.016	0.009	0.021	0.000
2	N	68	70	107	102	106	103	67	105	110
	Median	0.009	0.013	-0.001	0.004	-0.047	0.047	0.006	0.039	-0.022
3	N	55	57	83	82	84	82	53	73	88
	Median	0.015	0.047	0.022	0.029	-0.043	-0.003	0.015	-0.087**	-0.164

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

5.6.2.2. Secondary placings

Regarding the secondary offerings (panel B), the results are different. ROA is not significant in any of the years tested, while ROS is significantly higher from the benchmark firms by 5% the year prior the sale. The operating cash flows over sales (CFS) is also significantly higher during the two years prior the offer t=-1 and t=-2 by 5% and 7%, respectively. At first glance, the high ROS and CFS suggest growth prior the offer, consistent with the stock performance. However, in reality, the higher ROS (*EBITDA/Sales*) suggest smaller denominator, i.e. sales. Indeed, the sales turnover is significantly negative the years t=-2, t=-1 and t=0 by -8%, -8% and -11% respectively. In other words, these ratios suggest increased returns and cash-flows on sales, while in reality the sales are limited. Apparently, such trends indicate reduced sales growth. These accounting trends are possibly justified and consistent with the news reports associated with the offers, which state that a few sellers disagree with the management and choose to exit their investment.

The remaining accounting ratios are not significantly far from their corresponding matching firms. Apparently, the shareholders initiated the equity sale observe this

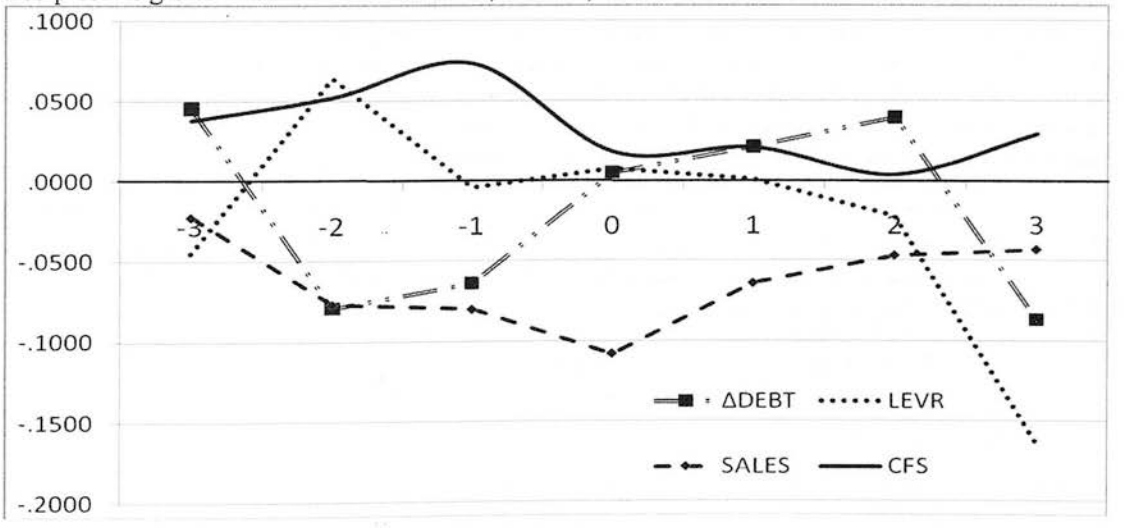
pattern and sell the stock when its ROS and CFS peak. Therefore, given the high stock performance prior the offer, the stock seems to be temporary over-priced at the announcement.

Figure 5.4 plots the time-series of these three measures for the secondary placings (ROS, CFS, SALES). In addition, Figure 5.4 additionally plots the leverage path (LEVR). Although it is not statistically different from the corresponding matching firms, its path indicates large variability from year to year. Interestingly, LEVR path after the sale is quite consistent with that of debt growth (ΔDEBT). The sales turnover (SALES) also indicates variability, however consistently negative. Taken all together, it appears that the firms involved do not document stability. Contrary, someone could even argue about uncertainty and low quality.

As a conclusion, considering the increased *AR* prior the offer, it seems that the sellers do identify a window of opportunity to sell overvalued stock. This is consistent with the timing hypothesis and the view that sellers identify a window of opportunity to sell overvalued stock (H5.1b).

Figure 5.4: Trend of accounting items for secondary placings

The graph presents the operating performance measures *ROA* and *CFA* for the secondary placings. It also presents growth measures such as *SGTH, TURNV, DEBT* and *ACTV* as defined in Table 5.3.



5.6.3. Accrual decomposition

Thus far, the findings indicate that primary placing firms are growing prior the offer, not only in terms of stock performance but also in terms of sales and debt. Contrary, secondary placing firms indicate low operating performance in contrast to the stock performance prior the offer. While both equity offers significantly underperform the years following the offer (which implies that the stock was overvalued at the announcement), earnings management might also "help" in misleading investors.

Table 5.4 examines the earnings management hypothesis. It decomposes accruals based on time (short and long) and managerial discretion (discretionary and non-discretionary) (see Teoh et al., 1998, Iqbal et al., 2009). Recal that if the earnings management hypothesis is valid, discretionary current accruals (DCAC) the year prior the offer will be significantly far from zero and, will indicate significant relationship with post-offer *AR*. Discretionary long-term accruals (LDAC) also suggest earnings management, while they are also likely to imply over/under-investment problems. Contrary, significant relation between non-discretionary accruals with the post-offer AR would support the timing hypothesis.

Table 5.4: Accrual decomposition

The table presents the accrual components, decomposed based on time and managerial discretion: discretionary current accruals *(DCAC)* and non-discretionary *(NDCAC)*, discretionary long-term accruals *(DLAC)* and non-discretionary *(NDLAC)*. Current accruals *(CAC)* equal the change in noncash current assets minus the change in operating current liabilities. To discriminate between discretionary and non-discretionary accruals, the cross-sectional modified Jones (1991) model is adopted where the current accruals are a linear function of the change in sales. It is modified as in Dechow et al. (1995).

		NDCAC		DCAC		NDLAC		DLAC	
FY	N	Levels	Bench. Adjusted	Levels	Bench. Adjusted	Levels	Bench. Adjusted	Levels	Bench. Adjusted
Panel A: Primary placings									
-2	158	0.002*	0.004*	-0.014	-0.011	0.028***	-0.041**	0.044***	0.081***
-1	179	0.000	-0.001	-0.012	-0.030	0.020***	-0.069***	0.012**	0.069***
0	190	-0.002	0.001	0.012	0.006	0.029***	-0.026**	-0.011	0.033*
1	175	0.003	0.007*	0.003	-0.002	0.016**	-0.040***	0.002*	0.022
2	147	0.004***	0.003*	-0.011*	-0.014	0.023***	-0.060***	0.013**	0.061***
Panel B: Secondary placings									
-2	85	-0.001	-0.004	0.001	-0.005	-0.002	-0.029***	-0.042**	0.017
-1	95	0.000	-0.001	-0.012*	-0.013	-0.001	-0.029***	-0.032**	0.040**
0	95	-0.001	-0.003	0.008	0.013	0.000	-0.021***	-0.045*	0.039
1	89	0.000	-0.002	-0.006	-0.015	-0.003**	-0.015***	-0.031	0.021
2	68	0.001	-0.005	-0.006	0.013	0.001	-0.018***	-0.052**	0.011

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

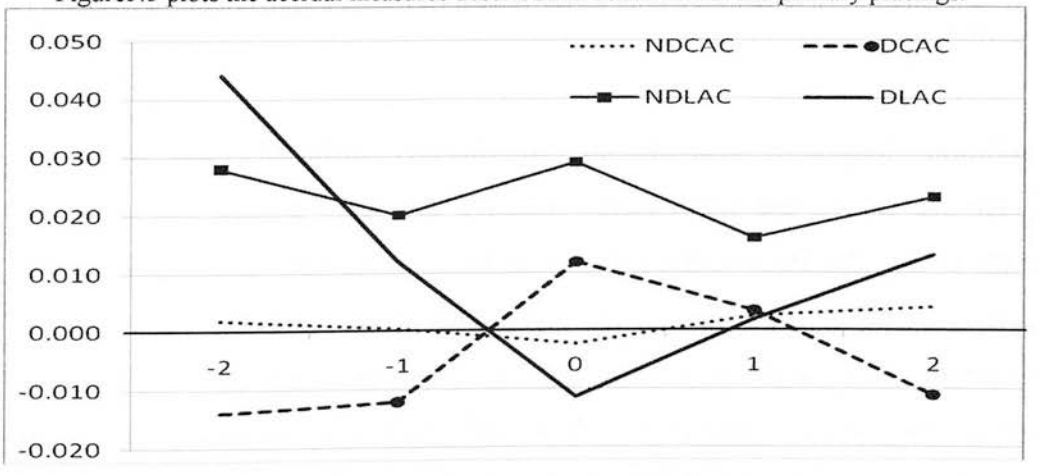
5.6.3.1. *Primary placings*

According to Table 5.4, the DCAC for the primary placings increases during the years prior the offer, however it is not statistically significant. This also holds for DCAC at the event year (see panel A). This contradicts the view that firms mainly use current accruals to manage earnings (Teoh et al., 1998; Iqbal et al., 2009). NDCAC are also insignificant. NDCAC are in fact close to zero for the years tested. Thus, current accruals do not seem to drive the abnormal performance or to inflate earnings of UK primary placings.

Contrary, long-term accruals are statistically significant. NDLAC are significantly positive during the three years -1, 0, +1 around the placing by approximately 2%. This implies lower levels of depreciation in comparison to the industry averages (see Figure 5.5 that plots the accrual measures described in Table 5.4). This might confirm the underinvestment problems of private placing firms (Hertzel and Smith, 1993). Likewise, DLAC are also significantly positive for the years around the offer. DLAC is also significantly higher from operating-performance matched firms the year prior the offer (benchmark adjusted as the Table 5.3 benchmarks).[46] Therefore, long-term accruals appear of higher ability to affect firm performance than current accruals. This contradicts to conventional view that firms manage earnings via current accruals (Teoh et al., 1998).

Figure 5.5: Median accruals for the primary placings

Figure5.5 plots the accrual measures described in Table 5.4 for the primary placings.



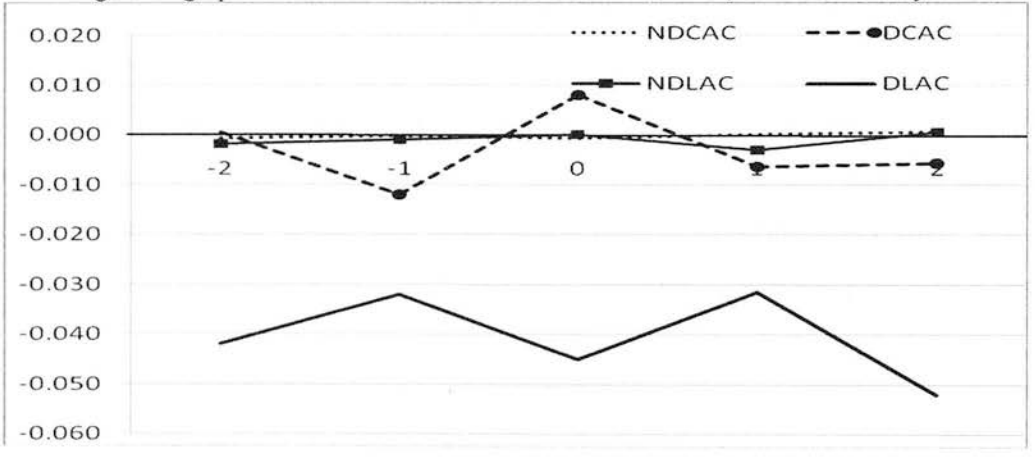
[46] Interestingly, operating performance benchmark adjusted NDLAC (as in Table 5.3) are significantly lower from the corresponding benchmark firms, suggesting higher fixed asset investments.

5.6.3.2. *Secondary placings*

Examining the accruals of firms involved into secondary placings, the results are different from the primary placings. DCAC is significantly negative the year prior the offer by -1.2%. This suggests conservative accounting policies and manipulative earnings adjustments via current accruals, such as stock revaluation and reduced credit sales. Downward earnings management and conservative accounting policies might aim tax avoidance or reduced dividend distributions to shareholders. This is also consistent with the lower sales reported in Table 5.3, as well as the earnings management hypothesis (H5.2b). Interestingly, NDCAC also become significantly lower the year prior the offer, while DCAC increases. Figure 5.6 that graphs the accrual paths indicate the DCAC 'jump' clearly. This is in line with the earnings management hypothesis.

Figure 5.6: Median accruals for the secondary placings

Figure5.6 graphs the accrual measures described in Table 5.4, for the secondary offers.



In addition, long-term accruals are significantly different from the industry expectations. DLAC are significantly negative the years around and immediately prior the event. This finding gives support to the earnings management hypothesis. It suggests that the firms involved into secondary offerings have higher long-term investments. This might also imply agency problems such as investments into negative NPV projects (Jung et al., 1996). Such interpretation could justify the news reports about disagreement of the sellers with the management and their desire to sell. It is further examined in section 5.6.5.2.

Finally, NDLAC seem normal in comparison with the industry averages. However they are significantly lower when they are adjusted based on the operating performance prior the offer. This increased depreciation component gives support to the timing hypotheses and the view that the firms over-invest. Overall, the findings suggest timing, which implications about downwards earnings management and agency costs are apparent.

5.6.4. Relations between performance, accruals and accounting growth

5.6.4.1. Aggressive vs. conservative manipulators

This section presents univariate analysis between the accruals, stock and accounting abnormal performance. Beyond the *BHAR* estimated in Table 5.2, the analysis additionally use market adjusted holding period returns over a three-year period following the placings. The returns are estimated relative to the event month zero, with the window starting four months after the previous FYE or the issue month, whichever is later (similar to Teoh et al., 1998a; Iqbal et al., 2009). The four months lag is to allow investors the time to get the available information from the financial statements. The offering firms are grouped into 'aggressive manipulators' (the firms that have DCA*C* and DLAC levels above the fourth quartile of the whole distribution) and to 'conservative manipulators' (below the first quartile).

- *Primary placings*

Primary placing DCAC aggressive manipulators indicate significant mean (median) underperformance based on the market adjusted BHAR of -49% (-57%). However, the remaining benchmarks suggest lower underperformance which is marginally significant. Contrary, the DCAC conservative manipulators indicate significant underperformance under all benchmarks. *BHAR* varies from -48% (-13%) to -72% (-54%), depending on the benchmark used. The difference between the post-offer underperformance of aggressive and conservative manipulators is statistically significant at the 10%. It is t herefore similar to Table 5.4. This finding is inconsistent with the view that aggressive manipulators perform worse (Teoh et al., 1998; Iqbal et al., 2009). UK pure placing firms do not aggressively manipulate

earnings to the extent that this causes post-offer underperformance. Contrary, conservative DCAC manipulators have lower post-offer underperformance.

In addition, firms the aggressively manage long-term accruals perform significantly worse that conservative DLAC manipulators. As firms with the highest DLAC are those with the less depreciation and amortization expenses, this is consistent with the view that primary placing firms do face significant under-investment problems (Hertzel and Smith, 1993).

Table 5.5: Aggressive vs. Conservative manipulators

The table displays the long-run performance of the placing firms, after categorise them into aggresive and conservative manipulators. Conservative are those firms whome their $DCAC_{-1}$ or $DLAC_{-1}$ belongs to the first quartily of their distributions, while conservative, those whome their $DCAC_{-1}$ or $DLAC_{-1}$ belongs to the fourth quartily. *BHAR (MV, MV+IND, MV+BTM)* is the buy-and-hold abnormal return measured as defined in Table 5.2. *BHAR (MKT.Adj)* is the market adjusted holding period returns, over the three-year period following the placing. The returns are estimated relative to the event month 0, either four months after the previous fiscal year end of the issue month, whichever is later.

	BHAR (MKT.Adj)	BHAR (MV)	BHAR (MV+IND)	BHAR (MV+BTM	BHAR (MKT.Adj)	BHAR (MV)	BHAR (MV+IND)	BHAR (MV+BTM)
	PRIMARY PLACINGS				SECONDARY PLACINGS			
Panel A: DCAC Aggressive								
N	58	58	58	58	15	15	15	15
Mean	-0.488***	-0.244*	-0.149	-0.256*	-0.534**	-0.609**	-0.533*	-0.705**
Median	-0.571***	-0.075	-0.101	-0.181*	-0.754**	-0.486***	-0.239*	-0.321**
Panel B: DCAC Conservative								
N	57	57	57	57	27	27	27	27
Mean	-0.578***	-0.721***	-0.484***	-0.668***	-0.199	-0.385	-0.040	-0.064
Median	-0.634***	-0.54***	-0.126***	-0.377***	-0.287*	-0.400	-0.046	-0.034
Panel C: DLAC Aggressive								
N	56	56	56	56	14	14	14	14
Mean	-0.739***	-0.897**	-0.282***	-0.455***	-0.44**	-0.331	-0.237	-0.413
Median	-0.696***	-0.629***	-0.091**	-0.189**	-0.602*	-0.528	-0.274*	-0.686
Panel D: DLAC Conservative								
N	57	57	57	57	62	62	62	62
Mean	-0.105	-0.204	-0.205	-0.053	-0.109**	-0.100	-0.097	-0.053
Median	-0.268	-0.049003	-0.105*	-0.009	-0.138	-0.182	-0.063	-0.004

*, **, *** indicate statistical significance at the 1%, 5% and 10% levels, respectively

➢ *Secondary offerings*

Regarding the secondary offers, the *BHAR* are negative (market adjusted, *MV, MV+Ind, MV+BTM*) only for the DCAC aggressive manipulators. When *BHAR* are market adjusted DLAC aggressive manipulators also indicate significant underperformance. However, the remaining sub-samples indicate mainly normal performance.

This supports the view that firms involved into secondary offerings aggressively manage earnings the year prior the offer, which significantly lead to post-offer underperformance. This supports the earnings management hypothesis (H5.2b).

5.6.4.2. Correlation coefficients

In sequence, Table 5.6 presents Spearman correlation coefficients between the various measures as at the year prior the placings and market adjusted three-year holding period *AR*, $MktAdjR_{+3}$. The past-offer performance $PERFO_{past}$ is also estimated relative to the event month zero, with the window starting four months after the previous FYE or the issue month, whichever is later. It captures the market adjusted returns over the 12-month period preceding the event and it is used as proxy for the timing hypothesis.

➢*Primary placings*

Regarding the primary offers, it is interesting that the long-terms accruals (discretionary and non-discretionary) are negatively correlated to the past-offer *AR* ($PERFO_{past}$), earnings (ROA, ROS) and cash-flow (CFA, CFS) performance the year prior the offer. Specifically, NDLAC indicate negative correlation coefficients of -0.134, -0.366, -0.298 and -0.226 with the $PERFO_{past}$, ROA, CFA, ROS and CFS respectively. Similarly, $DLCAC_{-1}$ are negatively correlated with $PERFO_{past}$, ROA_{-1}, CFA, ROS and CFS by -0.232, -0.55, -0.575, -0.413 and -0.546 respectively. These coefficients are statistically significant at the 5% and 1% levels and suggest that the higher long-term accruals do not signal expectations for value improvements. This supports the view that the firms face underinvestment problems.

Contrary, the debt and sales growth the year prior the offer (SGTH, ΔLEVR) are positively correlated with ROS. They indicate significant coefficients of 0.115 and 0.127 respectively. Likewise, the stock past-offer performance $PERFO_{past}$ is positively correlated with the past-offer accounting performance ROA, CFA, CFS. These suggest that the accounting growth ratios are able to signal expectations for value improvements, consistent with the over-optimism hypothesis (H5.1a).

Table 5.6: Spearman correlation coefficients

The table presents Spearman correlation coefficients. $MktAdjR_{+3}$ is the market adjusted buy-and-hold return over the three years following the placing. $PERFO_{(past)}$ is the holding period market adjusted returns for year prior the event. $\Delta LEVR$ and $\Delta ACTV$ represent the change of the variables $LEVR$ and $ACTV$ defined in Table 4.3, for the years -2 and -1 prior the placing. All the remaining variables are defined as explained in Tables 5.3 and 5.4.

	$MktAdjR_{+3}$	$DCAC_{-1}$	$NDCAC_{-1}$	$NDLAC_{-1}$	$DLAC_{-1}$	$SGTH_{-1}$	$\Delta ACTV_{-1}$	$\Delta DEBT\%_{-1}$	$\Delta LEVR_{-1}$	$PERFO_{past}$	ROA_{-1}	CFA_{-1}	ROS_{-1}	CFS_{-1}
Panel A: Primary placings														
$MktAdjR_{+3}$	1													
$DCAC_{-1}$	-0.008	1												
$NDCAC_{-1}$	-0.081	-0.28***	1											
$NDLAC_{-1}$	-0.139**	0.013	-0.071	1										
$DLAC_{-1}$	-0.376***	-0.018	0.011	-0.134**	1									
$SGTH_{-1}$	0.006	0.056	0.122*	-0.153**	0.032	1								
$\Delta ACTV_{-1}$	-0.125*	-0.139**	0.062	0.053	0.081	-0.143**	1							
$\Delta DEBT\%_{-1}$	0.135**	0.031	-0.056	-0.052	0.041	0.148**	-0.045	1						
$\Delta LEVR_{-1}$	-0.094	0.159**	-0.010	0.044	-0.040	-0.156**	0.076	0.007	1					
$PERFO_{past}$	0.348***	-0.084	0.058	-0.134**	-0.232***	0.074	-0.143**	-0.033	-0.014	1				
ROA_{-1}	0.373***	0.019	0.018	-0.366***	-0.551***	0.016	-0.072	-0.025	-0.046	0.259***	1			
CFA_{-1}	0.423***	0.252***	-0.023	-0.219***	-0.575***	-0.065	-0.019	-0.051	-0.099	0.267***	0.775***	1		
ROS_{-1}	0.331***	0.047	-0.018	-0.298***	-0.413***	-0.091	-0.061	0.115*	0.1270*	0.078	0.646***	0.512***	1	
CFS_{-1}	0.427***	-0.236***	-0.042	-0.226***	-0.546***	-0.042	-0.001	-0.024	-0.1161*	0.233***	0.72***	0.964***	0.505***	1
Panel B: Secondary placings														
$MktAdjR_{+3}$	1													
$DCAC_{-1}$	-0.070	1												
$NDCAC_{-1}$	0.127	-0.236***	1											
$NDLAC_{-1}$	-0.062	0.038	-0.1659*	1										
$DLAC_{-1}$	-0.178**	0.195**	-0.145	-0.409***	1									
$SGTH_{-1}$	0.010	0.011	0.117	-0.073	-0.065	1								
$\Delta ACTV_{-1}$	0.106	0.020	0.144	-0.056	0.041	0.148	1							
$\Delta DEBT\%_{-1}$	0.024	0.134	0.083	-0.036	-0.001	0.097	0.008	1						
$\Delta LEVR_{-1}$	-0.010	0.092	0.000	-0.179**	0.184**	-0.017	0.223**	0.043	1					
$PERFO_{past}$	0.113	-0.146	0.092	0.029	-0.139	0.006	0.069	0.003	-0.130	1				
ROA_{-1}	0.237***	-0.21**	0.109	-0.165*	-0.582***	0.115	-0.066	0.019	-0.078	0.059	1			
CFA_{-1}	0.184***	-0.569***	0.048	-0.119	-0.505***	0.086	-0.079	-0.113	-0.157*	0.168*	0.739***	1		
ROS_{-1}	0.131	-0.169*	0.069	-0.055	-0.31***	-0.035	0.028	0.115	-0.027	-0.074	0.48***	0.358***	1	
CFS_{-1}	0.293***	-0.508***	0.1888*	-0.142	-0.48***	0.219*	-0.109	0.001	-0.133	0.134	0.688***	0.843***	0.354***	1

***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively

Nonetheless, the remaining accounting growth ratios do not indicate significant correlation coefficient with the past accounting performance. Therefore, the correlation coefficients suggest that the stock and operating past-offer performance is mainly driven by accruals (discretionary and non-discretionary).

➢*Secondary placings*

As far as the secondary offers, mainly the discretionary accruals (current and long-term) indicate significantly negative correlation coefficients with the past-offer earnings and cash-flow based performance. Specifically, the correlation coefficient of DCAC with the ROA, CFA, ROS and CFS is -0.21, -0.569, -0.169 and -0.508 respectively. Similarly, the coefficient of DLAC is -0.582, 0.505, -0.31 and -0.48. The correlations are significant mainly at the 5% and 1% levels and suggest conservative accounting manipulation consistent with the findings of Table 5.4. Accruals do not enhance over-optimism about the stock performance prior the offer.

Regarding the accounting growth ratios, they do not seem to be correlated with the past-offer stock or operating performance. Only the leverage growth (LEVR) correlates with the CFA by -0.157. This correlation is marginally significant at the 10%. Finally, the past-offer stock performance is positively correlated only with the past-offer CFA and not with the remaining operating performance measures. Therefore, the correlations coefficients suggest that the accounting ratios of secondary firms are not able to signal expectations.

Contrary, discretionary accruals do have negative relation. Although this is consistent with the earnings management hypothesis, accruals cannot explain the past-offer stock overperformance. It seems that investors over-pay for the stock, without real justification that derives from the firm financial situation or accrual measurements.

5.6.5. Predicting the post-offer stock abnormal performance

Finally, Table 5.7 explains the post-offer underperformance for the two equity offering types. It presents multivariat OLS cross-sectional regression analysis, with dependent variable the market-adjusted holding period return, over the three-years

following the announcement. The models control for the size and BTM effects by including the natural logarithm of MV (ln(MV)) and the firm BTM ratio as additional explanatory variables. The ln(MV) and BTM are also estimated with a lag of four months after the previous FYE or the issue month, whichever is later. Main explanatory variables are the growth of the) various accounting and accrual measures the year prior the offer.

Table 5.7: OLS cross-sectional regressions

The table presents White (1980) corrected coefficients with dependent variable is the market adjusted holding period returns, over the three-year period following the placing. The returns are estimated relative to the event month 0, either four months after the previous fiscal year end of the issue month, whichever is later. $PERFO_{(past)}$ is the holding period market adjusted returns for year prior the event. The $D_{OffSIZE>=5\%}$ is a binary variable that takes 1 when the relative offered size is below the conventional 5% cut-off of the share capital and zero otherwise. The rest variables are defined as explained in Tables 5.1-5.4. Observations beyond the ±2 regression standard errors are omitted to avoid the impact of outliers. A 10 VIF value is required as multicolinearity test.

	PRIMARY PLACINGS		SECONDARY PLACINGS	
Model:	1	2	3	4
Depended var, sample	3yBHAR, Full sample	3yBHAR, At least 5% of sh.cap	3yBHAR, Full sample	3yBHAR, At least 5%
	coeff. p-value	coeff. p-value	coeff. p-value	coeff. p-value
Intercept	-1.053 (0.00)***	-1.337 (0.00)***	0.313 (0.358)	0.617 (0.262)
$NDCAC_{-1}$	-0.245 (0.581)	-0.247 (0.603)	-2.376 (0.05)**	-2.375 (0.048)**
$DCAC_{-1}$	-0.041 (0.843)	-0.073 (0.74)	-1.039 (0.068)*	-1.086 (0.063)*
$NDLAC_{-1}$	-0.132 (0.121)	-0.109 (0.225)	-0.666 (0.000)***	-0.850 (0.000)***
$DLAC_{-1}$	-0.259 (0.001)***	-0.237 (0.004)***	-0.739 (0.000)***	-0.709 (0.011)**
$SGTH_{-1}$	-0.050 (0.030)**	-0.054 (0.084)*	0.066 (0.523)	0.139 (0.237)
$\Delta ACTV_{-1}$	0.000 (0.636)	0.000 (0.636)	0.000 (0.352)	0.000 (0.591)
$\Delta DEBT\%_{-1}$	0.040 (0.074)*	0.046 (0.063)*	0.012 (0.748)	0.016 (0.644)
$\Delta LEVR_{-1}$	0.006 (0.551)	0.004 (0.716)	0.001 (0.628)	0.001 (0.68)
$PERFO_{past}$	0.030 (0.472)	0.010 (0.835)	0.085 (0.246)	-0.008 (0.923)
DISCOUNT	-0.017 (0.792)	0.090 (0.508)	0.082 (0.285)	0.321 (0.598)
$D_{OfSIZE>=5\%}$	-0.210 (0.038)**		-0.111 (0.321)	
ln (MV)	*yes*	*yes*	*yes*	*yes*
BTM	*yes*	*yes*	*yes*	*yes*
Industry dummies	*yes*	*yes*	*yes*	*yes*
Year dummies	*yes*	*yes*	*yes*	*yes*
Obs	*220*	*166*	*117*	*80*
Adj.R^2	*0.207*	*0.155*	*0.323*	*0.394*
F-test	*5.4****	3.53***	2.83***	2.77***

***, **, * indicate statistical significance at the 1%, 5% and 10% levels, respectively

5.6.5.1. Primary placings

Regarding the primary placings, Panel A suggests that the long-run post-offer performance is mainly driven by the DLAC (see models 1 and 2). It indicates a

negative coefficient of -0.259 and -0.237 respectively, statistically significant at the 1% level. This supports the earnings management hypothesis (H5.2a). It is also consistent with the view that primary placing firms face underinvestment problems (Hertzel and Smith, 1993). Recall that DLAC are significantly positive (see Table 5.4), suggesting reduced depreciation component and other long-term accruals. Therefore, the negative DLAC coefficient implies that the underinvestment reduces the firm value.

In addition, the models also support the over-optimism hypothesis. The sales growth (SGTH) has a significantly negative coefficient of -0.05**. Recall that SGTH is significantly higher than their corresponding benchmark the year prior the offer (see Table 5.3). The coefficient suggests that the sales growth eventually reduces the firm performance, irrespective of the signals sent at the announcement. Contrary, the coefficient ΔDEBT is significantly positive (0.04*), indicating that the market is likely to expect firms to use debt to fund an investment opportunity rather than issue equity (e.g. Myers, 1984).

Finally, controlling for the smaller relative offer size, it does not affect the results. Model 2 adds a binary variable $D_{OfSize>=5\%}$ that takes 1 for the offers above the 5% cut-off point and zero otherwise. The coefficient of the variable is significantly negative (-0.21**), suggesting that larger placings (in relative offer size) indicate significantly lower returns. This is plausible, considering that firms involved into smaller placings in relative offered size are large stocks with low asymmetric information. Therefore, they will indicate larger returns. Beyond this, the results are not sensitive to the $D_{OfSize>=5\%}$ inclusion (see model 2 that excludes all placings below the 5% cut-off point).

5.6.5.2. Secondary placings

Regarding the secondary placements, the results also suggest timing and earnings management. All accrual measures (discretionary and non-discretionary) have significantly negative coefficients (models 3 and 4).

Specifically, NDCAC and NDLAC document negative coefficients of -2.38 and -0.67, statistically significant at the 5% and 1% levels (see model 3). Both coefficients support the timing hypothesis and the view that the shareholders knowingly sell overvalued stock (Lee, 1997; Clarke et al., 2004). At the same time, the coefficients of DCAC and DLAC are also negative by -1.039 and -0.739, statistically significant at the 10% and 1% levels. Recall that DLAC is significantly negative the year prior the offer, which suggests increased depreciation components and over-investment. Therefore, both short and long-term discretionary accrual measures boost the post-event *AR*. Hereby firms are likely to invest into negative NPV projects that do not add value to the firm, suggesting agency costs (Jung et al., 1996). These coefficients favour the earnings management hypothesis.

Controlling for placings with small relative offer size does affect the results. Model 3 includes a binary variable to distinguish the placings of below and above the 5% cut-off point however the variable is not statistically significant. This suggests similar performance paths for both sub-samples. Excluding the small placings does not affect the conclusions either (see model 4). Finally, the accounting variables do not affect the post-offer abnormal performance at all, suggesting that investors do not consider the reduced sales as sign for overvaluation. As a conclusion, the results for the secondary placements imply that the sellers have abilities to sell when the stock is overvalued, while the firm manages the earnings the year before consistent with both timing and earnings management hypotheses.

5.7. Sensitivity tests

The results indicate significant reversal in stock performance, while operating performance appears normal. Stock performance is consistent with the empirical evidence (see Barclay et al., 2007; Hertzel et al., 2002; Kang et al., 1999) and it is robust to alternative controls and treatments (see section 5.4.1.3).

Regarding the operating performance, Hertzel et al. (2002) report significant negative abnormal *ROA* in all ±3 around a private placing and higher capital and *R&D* expenditure. Nevertheless, given the similar results between Teoh et al. (1998a) and Iqbal et al. (2009) for US and UK SEO, respectively, one would assume

that US and UK markets might report similar findings for private placements as well. Regarding the secondary placings, results are also inconsistent with the post-overperformance (Bethel et al., 1998; Barclay and Holderness, 1991), but look similar to insider trading. To control for this, the analysis is replicated by using the corresponding industry mean for each event firm, as performance benchmark. Industry benchmark is similar to Teoh et al. (1998a; b), Iqbal et al. (2009), Loughran and Ritter (1997) and Hertzel et al. (2002). The results are similar (not shown for brevity). Hereby the operating performance of primary placing firms does not follow the stock path, regardless of the benchmark. Contrary, the sales and debt growth do, which also controls for 'real earnings management' (e.g. Roychowdhury, 2006).

Additionally, several outlier treatments are used, such us winzorizing the distributions at the 1st and 99th percentiles on cross-sectional level for each fiscal year tested (-3, +3), cross-section winzorization without annual discrimination (to control for false elimination of any abnormal performance in a given year) and, raw medians without winzorization. Results remain qualitatively similar.

Finally, although not directly examined by this study, primary placing firms might have incentives to report "stable" earnings in order to be able to sell equity to institutional investors and fund managers (who are the main buyers; see section 4.6.1.3). These investor categories avoid investing into firms with volatile earnings (Michelson et al., 2000). Smoothing implies managerial incentives to reduce earnings volatility in order to signal higher quality (contrary to the traditional earnings management that accrual accounts are manipulated towards specific direction). It is "the process of manipulating the time profile of earnings reports to make the reported income stream less variable" (Fudenberg and Tirole, 1995, p.75).[47] Smoothing policies could be pronounced if different paths between earnings and cash-flow based ratios are reported (Lang et al., 2006). Therefore, the fact that primary placing firms report negative cash-flow based performance for the event year and the year after, but normal earnings-based (see Table 5.3) could be attributed to management's

[47] Ronen and Sadan (1981) define earnings smoothing as the managerial attempt to signal information to financial users. See also Beattie et al. (1994), Michelson et al. (1995, 2000), Oliverio and Newman (1997), Nagy and Neal (2001).

'earnings smoothing strategy' (which could be seen as another form of earnings management).

5.8. Summary and conclusions

This chapter focuses in explaining the long-run performance following non pre-emptive placements of equity, using primary and secondary UK offerings. It contributes by providing new evidence about the two equity offering types. It also examines the timing (Hertzel et al., 2002; Loughran and Ritter, 1997) and earnings management hypotheses (Teoh et al., 1998; Rangan, 1998) after taking into consideration the UK settings.

Specifically, the literature implies that the management identifies a window of opportunity to sell equity and times the offer when the stock is overvalued. The placing takes place when other events change the level of asymmetric information such as earnings and dividend announcements (Korajczyk et al., 1991; Loderer and Maurer, 1992; Lucas and McDonald, 1990), when performance peaks (Loughran and Ritter, 1997; Iqbal et al., 2009; Hertzel et al., 2002) when there is high event activity (Bayless and Chaplinsky, 1996) or insider trading (Lee, 1997). Nevertheless, the long-run post-offer performance deteriorates. Contrary, evidence about secondary offerings suggests overperformance following the event, as new, active and/or corporate investors participate (Bethel et al., 1998; Allen and Phillips, 2000; Barclay and Holderness, 1991). Overperformance is also document for private placings when active investors participate (Wruck and Wu, 2009; Krishnamurthy et al., 2005).

Similar UK evidence is sparse for both equity offering types. Additionally, the fact that investors in the UK are mainly existing shareholders rather than new ones (Armitage, 2010) provides additional interest as the performance paths and implications might differ. For this reason, this study assumes that primary placing investors are over-optimistic about the firm value, rather than knowingly sell over-valued stock. Hence, accounting characteristics beyond earnings might indicate how (and if) any over-optimistic behaviour prior the offer is justified. Accounting growth might signal growth and/or value improvements prior the event, facilitating the offer timing. Knowingly sales of over-valued stock is however plausible for the secondary

placings. Both hypotheses (timing and earnings management) imply that investors do not understand the real implications of the placing.

A few important findings emerge, as described in Table 5.8. The findings for the primary placings support the view that investors are over-optimistic about the stock value (H5.1a). The firms indicate significant stock over-performance the year prior the offer, which deteriorates afterwards. Contrary, the operating performance does not comply with the market valuations but, it is mainly normal the year prior the offer. This suggests overvaluation at the announcement. At the same time, the firms indicate increased sales and debt growth before the offer which deteriorate afterwards. Thus, sales and debt growth indicate similar path to the stock abnormal performance. These facilitate firms to time the offer by signalling growth. OLS analysis confirms this interpretation, as the sales growth measures can explain the long-run post-*AR*.

The findings also support the view that the firms have underinvestment problems (Hertzel and Smith, 1993). This is reflected by increased DLAC prior the offer. The increased DLAC documents significantly negative relationship to the post-offer *AR*, which also supports the earnings management hypothesis (H5.2a). Contrary, current accruals are not managed, which does not comply with the view that firms use current accruals to mislead investors. Overall, it seems that investors do not understand that the stock is overvalued or that the implied growth is temporary. They are over-optimistic about the future firm value.

As far as the secondary placings, the firms indicate similar stock performance: over-performance prior the offer which deteriorates afterwards. This is consistent with the premise of the timing hypothesis. Sellers do have timing ability to sell stock when it market overvalued. This contradicts the predominant US evidence on value improvements following transactions of existing block of shares (Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Philips, 2000). Contrary, the findings are in line with prior US findings about insider trading (Lee, 1997; Clarke et al., 2004; Marquardt and Wiedman, 1998).

In addition, the operating performance of secondary offering firms is mainly normal. Interestingly, the sales are significantly lower than the corresponding benchmarks. Consistely, the analysis detects significant downwards earnings management the year before the offer. Downwards earnings management might target tax avoidance or reduced dividend allocations. At the same time, the findings imply overinvestment problems that eventually reduce firm value. Hereby, considering that secondary placings constitute transactions with blocks of listed shares initiated by existing shareholders, the findings suggest that the sellers take advantage of information they possess about the firm financial situation and, sell the stock at the best convenient time. Such findings are new for the extant literature.

Table 5.8: Summary of main findings of chapter five

The first column presents the hypothesis tested, the second the relevant expectations and the third whether the results support a specific hypothesis with regards to the two offering types. *AR* is the abnormal returns. *DCAC* is the discretionary current accruals, *NDCAC* the non-discretionary current accruals, *DLAC* the discretionary long-term accruals and *NDLAC* the non-discretionary long-term accruals. The accruals are defined in Table 5.4. *ROA* and *CFA* are the return-on-assets and operating cash-flows on assets, respectively.

Hypothesis	Prediction	Consistent results	
		Primary	Secondary
H5.1. Over-optimism / Timing	(+) *AR* prior the event	√	√
	(-) *AR* afterwards	√	√
	Significant relation between *NDCAC* or *NDLAC* & post-offer *AR*	×	√
	Accounting growth	√	×
	Significant relationship between accounting measures & post-offer *AR*.	√	×
H5.2. Earnings management	Significant *DCAC* the year before the event	×	√ (-)
	Significant relation between *DCAC* & post-offer *AR*	×	√ (-)
	Significant DLAC	√ (+)	√ (+)
	Significant relation between *DLAC* & post-offer *AR*	√ (-)	√ (-)
Additional Accounting Information	ROA	*Mainly normal, (-) after*	*Normal*
	CFA	*Normal before, (-) after*	*Normal*
	Sales growth	(+)	*Normal*
	Sales turnover	(-) at t=0	(-)
	CapEx+R&D	*Normal*	*Normal*
	Debt growth	(+)	*Normal*
	Leverage	*Normal*	*Normal*

Chapter 6 : The Puzzling Reversal of Private Placement Abnormal Returns

6.1. Introduction

This chapter examines the puzzling reversal of abnormal returns following a private placing. It focuses on the fourth research objective (*Obj.4*) of the study and answers the third, fourth and fifth research questions (Q3, Q4 and Q5). Hence, beyond the reversal, it also examines whether the inclusion of illiquidity as a risk factor facilitates in assessing expected returns. This is the second part of the third research objective *(Obj.3)*.

The chapter is structured as follows. Section 6.2 provides the motivation and the main contributions of this chapter. Section 6.3 emphasizes on the relevant literature and develops the testable hypotheses. Section 6.4 describes the event study approaches applied and explains several adjustments in *AR* and risk factors that this study formulates. Section 6.5 describes the sample and descriptive statistics. Section 6.6 presents the empirical findings and discusses the results, whilst the last section 6.7 concludes.

6.2. Motivation and main contributions of the chapter

This chapter is motivated by a pattern that implies systematic mispricing and market inefficiency. Precisely, private placements are reported to cause positive market reactions at the announcement.[48] These positive reactions are attributed to expectations for value improvements as the firm is likely to signal undervaluation (Hertzel and Smith, 1993), or active investors are expected to improve firm value after joining the firm (Wruck, 1989; Wruck and Wu, 2009). Nevertheless, the firm abnormal performance turns negative few years later (see Hertzel et al., 2002; Barclay et al., 2007; Sheehan and Swisher, 1998 for US; Kang et al., 1999 for Japan).

[48] See Hertzel and Smith (1993), Wruck (1989), Barclay et al. (2007) for US; Kang and Stulz (1996), Kato and Schallheim (1993) for Japan and Wu et al. (2005) for Hong-Kong.

The most common explanation of this *AR* reversal is that investors are over-optimistic when the private placement is announced (Hertzel et al., 2002). They have high expectations about the firm value and react positively. However, as the expectations are not fulfilled, *AR* reverse. This pattern implies systematic miss-valuations of the placing stock. Are private placing investors so naïve and do not learn from the past? This is the primary question of this chapter.

The fact that the sign of *AR* changes over time, raises the question whether the announcement reactions are able to capture the impact of corporate decisions on shareholder wealth (Loughran and Ritter, 1995). The long-horizon abnormal underperformance and the overreaction interpretation imply a window of opportunity for the firms to sell equity. Supportive arguments suggest the management times the offer to take advantage of favourable market conditions (Bayless and Chaplinsky, 1996). Alternatively, other arguments advocate that firms take advantage of temporary firm growth (Chapter 5), sell shares when the stock is overvalued (Lee, 1997; Lee and Masullis, 2009; Clarke et al., 2004; Loughran and Ritter, 1997; Chapter 5), sell stock after having manipulated earnings (Teoh et al., 1998; Rangan, 1998; Iqbal et al., 2009; Yoon and Miller, 2002) and/or, 'hype' the stock by increasing their disclosure activities (Lang and Lundholm, 2000). Such arguments imply the stock is systematically miss-priced but investors do not realize the miss-valuation ex-ante the offer. SEO are overpriced (Pontiff and Schill, 2002), but the market realizes the overvaluation with a delay.[49]

These interpretations imply that few individuals who are aware of this pattern can systematically 'beat the market' and yield higher profits. This fact casts strong doubts on market efficiency. Nevertheless, Malkiel (2003) observes that when an anomaly that provides systematic and significantly higher adjusted returns to specific investors comes into light (e.g. the January effect, seasonalities), its effect becomes lower as more and more investors try to explore these arbitrage opportunities and,

[49] Several studies suggest over or under-reactions to SEO and IPO, e.g. Lougrhan and Ritter (1995) examines US IPO and advocates for an under reaction argument (announcement AR are negative and become more negative afterwards). See also other studies that report over- and/or under-reaction to corporate events such as Lakonishok and Ritter (1992); Antweiler and Frank (2006); Ikenbery et al. (1995); Conrad and Kaul (1993).

they eventually vanish. This fact provides additional motivation to examine further this *AR* reversal, questioning the robustness of this pattern after becoming known.

This study contributes to the extant literature by investigating this reversal in depth. It first follows the suggestion of Fama (1998) that 'anomalies' should be received with scepticism and out-of-sample cross-confirmations (Fama, 1991; 1998). More specifically, evidence on the private placement *AR* reversal are mainly documented for the US market and Japan. Little evidence for the reversal is also implied for Norwegian private placings (Eckbo and Norli, 2004). The current study explores the puzzle by following out-of-sample tests with recent UK private placements, for which evidence is in elementary stage. Hereby, although the current study does not directly examine market efficiency, it contributes to the Efficient Market Hypothesis (Fama, 1970; 1991).

Beyond the new market, the study mainly contributes by examining several alternative explanations on why private placement *AR* are likely to reverse. First, arguments exist against the ability of the long-run *AR* methods to estimate the variation of expected returns. Brav and Gompers (1997), Mitchell and Stafford (2000) and others advocate that the several 'event anomalies' that strongly reject the efficient market hypothesis, actually reflect misspecifications of the models of expected performance.[50] This raises the question whether the reported performance attributed to the event, or the deficiencies of the event-study approach. As the chapter focuses on the *AR* paths, the need for robust inferences is fundamental.

This chapter assesses short- and long-horizon *AR* for periods around the announcement, issue day and up to three years following the event. It applies several traditional long-run *AR* methods (e.g. Lyon et al., 1999; Mitchell and Stafford, 2000; Fama, 1998), while it makes a step beyond the conventional methodologies and measures liquidity-adjusted *AR* (Liu, 2006). Additionally, by applying a liquidity asset-pricing model (Liu, 2006) the study adds to the event-study literature, as well as considers liquidity cost as a risk factor. This test complies with the findings of Eckbo et al. (2000) and Eckbo and Norli (2005) who argue that the conventional models fail to capture for the liquidity exposure of issuing firms. Further, the study

[50] See the Chapter 3 for further details.

contributes by borrowing arguments from related areas of corporate finance (i.e. IPO and dividend areas) as well as by testing possibilities previously examined for other SEO types (e.g. other information at the announcement and investor speculative activities).

Precisely, Schultz (2003) examines the underperformance of IPO and argues for a 'pseudo-timing' hypothesis that firms sell shares when prices of other firms participating to the event are high. The fact that performance peaks at the offer is a fact observed ex-post and not ex-ante. The managers being able to time the offer (see section 6.3.3). Second, the private placing announcement reduces the asymmetric information (Hertzel and Smith, 1993) and it is likely to improve the stock liquidity (Leuz and Varrecchia, 2000). If however the benchmark model cannot adjust for relative risk changes, the reported *AR* will be downward biased, as event returns will be compared with higher expected returns (e.g. Eckbo et al., 2000). The study contributes by testing the contemporaneous changes in the risk factor loadings following the event and, whether the reported *AR* are subject to matching technique faults.

A different hypothesis builds upon the evidence that SEO firms release other kind of information along the announcement (Korajczyk et al., 1991; Antweiler and Frank, 2004). Thus, the isolation of the private placing information from other information is difficult. This hypothesis argues that the *AR* reversal is subject to the overall information environment around the announcement. Hereby, part of the reported *AR* might reflect the performance of other events. Finally, the study tests the possibility that the temporary increases in share prices derive from speculative activities of specific investors (e.g. Kim and Shin, 2004). As in the UK the placing price is set before the announcement and remains fixed until the issue day, investors may aim to buy the share at the offered price directly from the firm and, sell it at higher price immediately after the issue. Such possibility would imply incentives to manipulate the price upwards. Thus, the announcement *AR* might be illusionary.

Overall, this study adds to the body of knowledge regarding private placements of equity and provides insights in understanding this particular puzzle. It also

contributes to the market efficiency literature, to the long-run *AR* methods and expected cost of equity methodology.

6.3. Hypotheses development and empirical predictions

6.3.1. *AR* reversal and overreaction

In a private placing, the management agrees to place shares privately with specific investors after direct negotiations between the parties involved. The private investors need to 'acquire' the necessary information about the firm, ex-ante the agreement. On that basis, the certification hypothesis (Hertzel and Smith, 1993) suggests that the private placement announcement signals 'good news', that the firm is likely to be undervalued (it is not a 'lemon'; c.f. Akerlof, 1970). This causes positive announcement *AR*. Since the market was not aware about the true firm value prior the investigation of the private investors, it is plausible to state that the firms are mainly stocks with high asymmetric information (Wu, 2004; Chemmanur and Fulghieri, 1999).

Without doubts, the firm announcement to place equity privately changes the existing level of information asymmetry between the firm and the market. This change affects investor willingness to trade large quantities of the stock, affecting the announcement *AR*. Nevertheless, unless an unanticipated event changes again the level of asymmetric information, it is unlikely that information alone can explain the reported reversal in *AR*. Based on the certification, if the market is efficient, long-horizon *AR* should have been nil as the market prices would adjust for the placing information after its public announcement.[51]

The fact that the sign of *AR* reverses over time does not 'fit' within the notion of the certification wisdom. Hertzel et al. (2002) argue that this inconsistency to market reactions is due to market overreaction at the announcement: the market expects firm

[51] Wruck (1989) provides a different explanation of the positive announcement reactions. She advocates that the market reacts positively due to the intentions of the new investors to monitor the incumbents and improve performance. Similarly, studies examining the post-purchase activities of investors, report positive or nil post-abnormal performance when the equity buyers are active investors, affiliated or corporations (Krishnamuthy et al., 2005; Wruck and Wu, 2009). Although this study does not examine this monitoring argument, the analysis controls for this possibility by using monitoring proxies into multivariate regression analysis.

value improvements and thus, announcement *AR* are positive. When expectations are not fulfilled the firm value declines. Hence, it implies systematic market reactions towards the wrong direction. Investors systematically make the same mistake and do not learn from the past.

Although the evidence on UK private placements is unclear, intuition suggest that *AR* reversal is valid. Pure private placements and placements with open offers underperform few years after the event (Chapter 5 and Ho (2005) respectively). At the same time, pre-emptive offers, placings accompanied by pre-emptive offer and accelerated book-build placings cause positive market reactions at the announcement (Armitage, 2010; Balachandran et al., 2009). Thus, the first hypothesis examines these arguments.

H6.1a: *AR following UK private placings are mean reverting*
H6.1b: *Investors overreact at the announcement*
H6.1c: *There is a momentum effect in AR*

The study examines the reversal (*H6.1a*) by assessing the short and long-run performance following UK private placements. It applies several methods and control for known problems for robust inferences (see section 5.4.1.3). Further, a simple test for the overreaction hypothesis (*H6.1b*) is a negative correlation between the announcement and long-run *AR* (Hertzel et al., 2002), while long-run *AR* are controlled for momentum strategies.

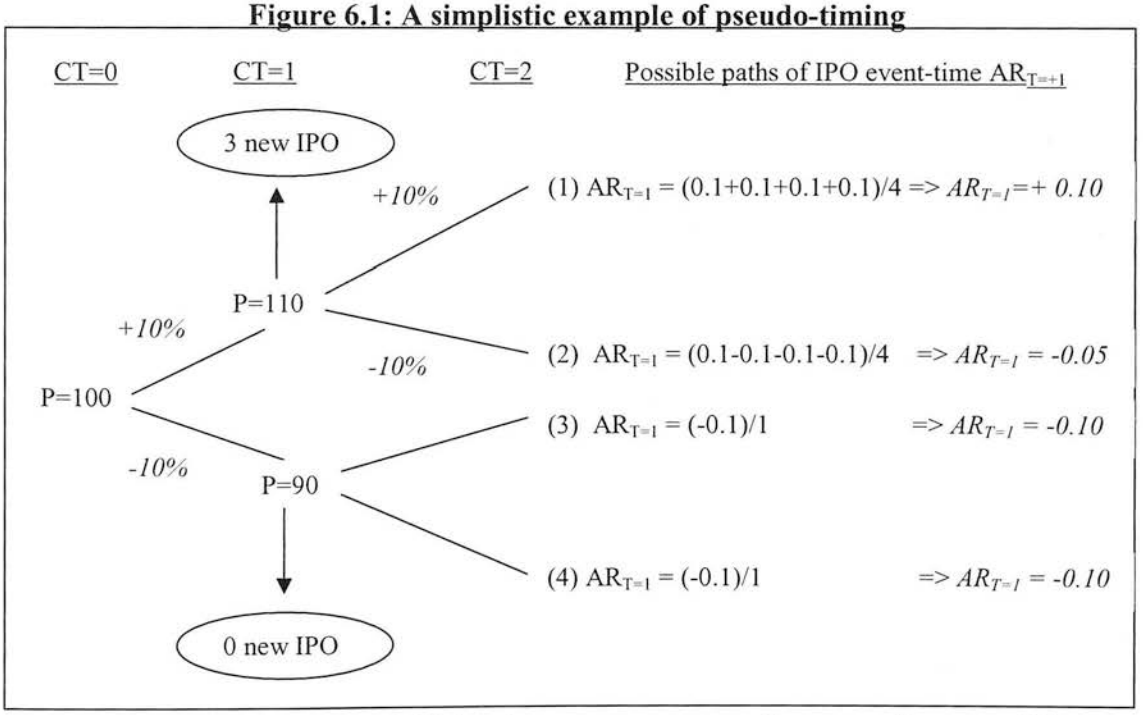
6.3.2. Pseudo-timing

Schultz (2003) provides an interpretation for the underperformance of IPO and SEO firms that could also explain the private placing *AR* pattern. He advocates that long-term *AR* are likely to be negative even when the market is efficient and the management does not have the ability to foresee that the stock value will decline. Firms go public because they can sell equity at high price similar to other firms, without timing ability: the higher the share price, the more likely they will issue. Not because firms attempt to sell overvalued stock at that particular time (as implied by

the known timing hypothesis). The fact that performance peaks around the offer is something observed ex-post.

A simple example indicated by Schultz (2003, p. 786) facilitates in understanding the premise of the pseudo-timing hypothesis. Let us make a few simplistic assumptions. First, all potential IPO firms earn the same returns as recent IPO firms and, their per-share value is the same. At calendar-time zero (CT=0) the IPO price is 100 and one IPO occurs. Second assumption, all IPO firms earn the market return plus an excess return of ±10. The possibility of *AR* goes up or down is 50% and it is unpredictable. Third assumption, if the IPO price exceeds 105, it attracts three private firms to go public. If the IPO price is between 95 and 105 it attracts one new IPO. If the IPO price falls to 95 or below, no IPO activity takes place. For simplicity, the example measures only the *AR* for the event-period T following each IPO, T=+1.

Figure 6.1: A simplistic example of pseudo-timing



As there are only two possibilities for excess returns, there are four possible IPO prices and *AR* paths until the CT=2, as shown in Figure 6.1. The first path is when the IPO price goes up for two subsequent periods (1). When the price becomes 110, three new IPO will take place. Hence, the three new IPO will take place *after* the price peaks, rather than deciding ex-ante. Each of the IPO firms yield +10% in their first event-period (T=+1). The mean event-time $AR_{T=1}$ for the one old and three new IPO will be +10%. The second path (2) shows the possibility that the price reaches

110 at CT=1, attracts again three new IPO ex-post, however the excess return in the subsequent year is negative. Thus, the mean event-time $AR_{T=1}$ for the one old and three new IPO will be -5%. The last two paths (3) and (4) indicate the possibility that negative *AR* occur at CT=1. When the IPO price is 90, no new IPO will occur and the mean event-time $AR_{T=1}$ will be -10% regardless of the subsequent *AR*.

Therefore, the example shows that when *AR* are measured in event-time (each event is weighted equally), there are 75% probabilities for negative mean $AR_{T=+1}$ even when the expected returns for each individual offer are zero. Contrary, calendar-time $AR_{CT=1}$ (each calendar-period is weighted equally) are zero. Apparently, from the possible four paths only one will happen.

The managers use the 'trigger prices to determine when to issue' (Schultz, 2003, p. 485) and the decision is taken ex-post. According to the pseudo-timing hypothesis, the reason of why firms will issue when the prices are high is not important. They might believe they can explore more growth opportunities, avoid large dilutional effects, or any other reason. Hence, it is often the case that offerings cluster in particular periods. Schultz (2003) suggests that the covariance between *AR* and the number of future offerings is positive (negative correlation between the number of ex-post issuing firms and *AR*). Using binomial tree simulations, Schultz (2003) argues that the probability for negative ex-post event-time *AR* exceeds 50%, even when expected returns ex-ante are zero. However, estimating calendar-time *AR*, the possibility to observe post-underperformance is eliminated.[52]

On that basis, pseudo-timing could explain the lower *CTAR* reported by prior studies examining IPO and SEO such as Loughran and Ritter (1995), Brav and Gompers (1997), Gompers and Lerner (2003). However, studies such as Dahlquist and De Jong (2008), Viswanathan and Wei (2008) and Ang et al. (2005) argue that pseudo-timing assumes stationary event process and could be a potential explanation for small samples. Hereby, selling new stock might has nothing to do with the management's ability to know ex-ante when the stock performance peaks, or to its ability to explore abnormal gains by selling overvalued stock.

[52] Exactly because *CTAR* weights hot and cold periods equally, Loughran and Ritter (2000) advocate against the *CTAR* approach. They doubt the ability *CTAR* approach to detect *AR* See further discussion on this in Chapter 3.

H6.2: The management does not have timing ability. Rather, the more the placing firms receive by selling the stock the more firms participate to the event.

A simple indicator for the pseudo-timing hypothesis is to observe whether the event clusters in specific time periods. Second, if the pseudo-timing hypothesis is valid, significant *CTAR* will disappear or become lower in comparison to the reported event-time *AR*.

6.3.3. Liquidity and risk-factor adjustments

This story addresses the puzzle from a different angle and doubts the power of the traditional asset pricing models to adjust for the placing implications. In particular, evidence suggests that firms conducting SEO are mainly illiquid stocks (Loderer et al., 1991; Barclay and Litzerberger, 1988). For that reason, uninformed investors are less willing to trade large quantities of stock. They undertake higher risks which are often associated with the cost of selling shares (or the cost of raising equity) and the level of asymmetric information (Diamond and Verrecchia, 1991). Hereby, due to difficulty in selling illiquid stock, the firms need to compensate investors with discount (Kyle, 1985; Altinkilic and Hansen, 2003; Corwin, 2003; Silber, 1991; Gao and Ritter, 2010).

In the same vein, Bowen et al. (2008) consider underpricing as the cost of raising equity (documenting lower underpricing for firms with lower asymmetric information). Marquart and Wiedman (1998) imply that the level of asymmetric information is positively related to the cost of capital. The required rate of return on equity should thus be an increasing factor of the level of asymmetric information. Indeed, the economic theory suggests that when the information asymmetry is reduced, the corresponding component of the cost of capital is also reduced (Diamond and Verrechia, 1991; Leuz and Varrecchia, 2000).

Considering that the private placement announcement reduces the level of asymmetric information between the firm and the market (Hertzel and Smith, 1993), reduction in the cost of equity is pronounced. This reduction should increase the

stock trading volume and stock liquidity (to reduce liquidity premium).[53] Consequently, the current stock prices are to rise (Diamond and Verrechia, 1991).

Nevertheless, the fact that *AR* become negative few years later, implies contemporaneous changes in liquidity and/or other risk factors, components of the cost of equity. Hence, it is plausible to argue that the expected rate of return is subject to changes over time.[54] Eckbo et al. (2000), Brav et al. (2000) and Eckbo and Norli (2005) suggest that SEO stocks become less risky after the offer, as the firms have less leverage. As a result, the expected return of the SEO firms is lower in comparison with a benchmark chosen based on pre-event firm characteristics. Additionally, Eckbo et al. (2000) document significant increase in stock volume turnover related to SEO, which is not reported by the corresponding benchmarks (even without including liquidity in their six-factor model). It can therefore be argued that, as the stock illiquidity is reduced, the expected returns should be reduced (Amihud and Mendelson, 1986). If the model used to measure long-run *AR* fails to adjust for changes in risk, the reported *AR* will be biased downward (as the event-*AR* will be compared with less liquid stocks with higher cost of equity).

H6.3: *The stock liquidity increases after the placing but the benchmark used to measure long-run AR does not properly account for this risk reduction*

This liquidity/risk adjustment hypothesis suggests that the stock becomes less risky in terms of liquidity after the placing, reducing their expected returns. Nevertheless, if the benchmark continues to consist of firms with higher risk, the estimated expected returns will be higher, resulting to negative *AR*. This is consistent with Eckbo et al. (2000) who report significantly lower risk loadings (lower exposure) following the SEO in comparison to benchmarks. They suggest that the matched-technique is 'by itself likely to generate abnormal performance' (ibid, p.272). Herby, the liquidity hypothesis can by divided into two sub-hypotheses as follows.

H6.3a: *Liquidity is a significant factor in AR*

[53] Similar arguments are argued by Diamond and Verrecchia (1991), Kothare (1997), Conrad and Conroy (1994).

[54] Such assumption is plausible even without arguing that the long-term change in cost-of-equity is completely driven by the event. Between the announcement and the end of a long-run event window for which AR is measured, several events take place that might change the cost of capital of the stock.

H6.3b: *There are model misspecification problems*

To test these arguments the study follows three steps. First, it examines the associations between firm-specific liquidity variables (namely the bid-ask spread and trading volume) with the *AR*. Positive (negative) relation to the spread (volume) would imply illiquidity premium at the announcement.

Second, as the hypothesis assumes failure of the pricing model to capture the appropriate risk factors, e.g. stock (il)liquidity, the changes in risk factor loadings following the placing are examined. Eckbo et al. (2000) suggest benchmark controls for leverage and liquidity risk factors, while Boechme and Sorescu (2002) propose tests of risk loadings changes in future long-horizon event studies. The current study directly investigates both of these propositions, i.e. changes in risk factor loadings following the placements and, the liquidity as a risk factor.

In particular, regarding the factor loading changes, this study follows an approach in a manner similar to Boehme and Sorescu (2002) and Grullon et al. (2001).[55] If the sample is over-populated with stocks that have changes in risk factors(before and after), expected rates of return will reverse. Thus, *AR* will reverse (Boehme and Sorescu, 2002). This hypothesis, predicts that if the stock becomes less risky after the event, the change in risk factor coefficients will become significantly negative.

Regarding the liquidity as a risk factor, the study applies a 'liquidity adjusted' capital asset pricing model (Liu, 2006). Similar to 'traditional' asset pricing models, liquidity-pricing models aim to identify factors that explain the market prices (and returns) via liquidity strategies, which are argued to explain and predict future returns in the same spirit as a traditional pricing model; e.g. Amihud (2002) measures the illiquidity-return relation over time, documenting positive relationship between ex-ante stock returns and expected aggregate illiquidity (*AR* reflect expected market illiquidity). This method facilitates in answering whether illiquidity as a risk factor explains the *AR* (beyond the traditional size and BTM risk factors). If so, the liquidity adjusted *AR* will be lower, while the illiquidity risk-factor might be able to

[55] Boehme and Sorescu (2002) and Grullon et al. (2001) examine the long-run *AR* following dividend initiations and resumptions and, increase in quarterly dividends, respectively.

explain better the *AR* patterns. This model also contributes to the on-going debate on the proper approach to estimate long-run *AR*.

6.3.4. Other information at the announcement

This hypothesis relates the *AR* reversal with agency issues. Previous studies report that SEO are followed by other events such as earnings announcements (Korajczyk et al., 1991), business cycles (Choe et al., 1990), dividend announcements (Loderer and Maurer, 1992), increased disclosure activities prior the offer (Lang and Lundholm, 1997), acquisitions (Agrawal et al., 1992; Rau and Vermaelen, 1998 for US, Gregory, 1997 for UK). Therefore, someone could argue that other events that take place around the equity offering might cause the reported *AR*, rather than private placement. In other words, this hypothesis (*H6.4*) predicts that pooling together the private placing samples without distinguishing based on other events announced around the placing, is what causes the reported reversal. Accordingly, the following hypothesis is tested.

H6.4: *Controlling for other events at the placing announcement time eliminates the reversal.*

Based on this possibility, a careful look at the news released around the private placing is taken, aiming to identify whether other events take place at the same time. Indeed, approximately 43% of the firms announce investment plans or the firm intention to expand by acquiring another company. These placements are categorized as offers associated with 'investment news'. Contrary, about 7% of the sample reports that the private placing funds are essential for the firm operating activities (implying relative distress), whilst few firms announce plans for reorganization and/or reconstruction. 36% of the firms state that the placing funds are to strengthen the firm financial situation, for working capital purposes and/or make the firm able to explore new opportunities, i.e. they do not specify the placing purpose. They just imply pure fund raising. Reorganization and pure fund raising are assumed to be associated with 'operating news', as the placing funds seem necessary for the firm to continue its operations. Several possibilities around these events might be valid.

Specifically, if the 'investment news' sub-sample involves investments into projects with positive NPV, the market will react positively consistent with the certification hypothesis (Hertzel and Smith, 1993). The prices should be adjusted during the long-run, reporting normal performance (*H6.4a*). However, an exclusive hypothesis that the firm invests into negative NPV projects is also valid (Wu and Wang, 2005). If the market interprets the offer as overinvestment signal, negative short and long-run *AR* are expected (*H6.4b*).

H6.4a: *The investment news sub-sample involves positive NPV projects that cause positive announcement AR.*

H6.4b: *The investment news sub-sample involves negative NPV projects that cause negative short and long-run AR.*

Likewise, the 'operating news' sub-sample also has two mutually exclusive hypotheses. If the market expects value improvements because of the firm's plans to reorganize itself or to take advantage of potential growth opportunities, positive announcement reactions are to be documented. The long-run *AR* will also be positive if future opportunities are taken (*H6.4c*). Contrary, if the market conceives the fund rising as typical procedure for the firm operations, no significant *AR* should be reported (*H6.4d*).

H6.4c: *Operating news signal future value improvements due to reorganization plans, thus positive short and long-run AR are expected.*

H6.4d: *Operating news conveys that the placing is a typical act for the firm to operate normally (i.e. no significant AR).*

Finally, if the market is unable to understand the relevant implications immediately, the reactions will be observed with a delay (*H6.4e*). In such case, long-run *AR* will reflect the placing implications and could be either positive or negative (however no reactions at the announcement). Hence, each sub-sample predicts different *AR* paths.

H6.4e: *The market is unable to understand immediately the placing implications regardless of the other news released.*

6.3.5. Price manipulation / speculation

Finally, the temporary price reversal might be associated with the speculative activities of specific investors. A manipulative possibility consistent with the private placement reversal is that, speculators hold long positions of the event stock. That is, they commit to buy the shares directly from the company at the discounted offered price (primary market) and sell the stock at the secondary market immediately after the issue at a higher price. Hence, they might have incentives to manipulate the market price *upwards* for a short period, consistent with the positive *AR*. Once the shares are issued, they can sell at a higher price, taking advantage of the positive market reactions.

H6.5: *Private placing investors drive the market price upwards until the issue day when they immediately sell at higher price.*

Considering that the UK placing investors are mainly institutional and professional investors (Armitage, 2010), this hypothesis is plausible. Investors should be able to trade large quantities of a specific stock and thus, able to affect the market prices. Thus, they will create a selling pressure for the stock immediately after the issue, which can cause *AR* to reverse.

6.4. Research design and methodological details

6.4.1. Market reactions around the announcement and issue day

The initial market reactions are measured following the so called index model (Lakonishok and Vermaelen, 1990). *AR* are defined as the difference between the returns of the event firm j $(R_{j,t})$ and the market $(R_{mkt,t})$, over the same day t, $AR_{j,t} = R_{j,t} - R_{mkt,t}$. The cumulative *AR* over the tested period $(CAR_{j,T})$ is:

$$CAR_{j,T} = \sum_{t=1}^{T} AR_{j,t} \qquad \text{Eq. 6:1}$$

T corresponds to the length of the event-window. The path of AR is examined over 3, 4 and 11-day windows of (-5, +5), (-3, -1), (-1, +1), (+1, +3) around the announcement and issue day. Longer windows are also examined, following the

Lease et al. (1991) suggestion that to capture the market reactions following a corporate event, one should examine longer windows. Results do not change.

In addition, selling additional shares at a price different than the market one involves a mechanical dilution that changes the market price of the stock (i.e. the price at the day after the event should be the weighted average price between the new and old shares; see section 4.4.1). To control for this mechanism, the AR are adjusted similar to Wruck (1989), Hertzel and Smith (1993), Hertzel et al. (2002):

$$CAR_{adj,j,T} = [1/(1-a)][CAR_{j,T}] + [a/(1-a)][(P_{mkt} - P_{pl})/P_{mkt}] \qquad \text{Eq. 6:2}$$

$CAR_{adj,j,T}$ is the price-adjusted $CAR_{j,T}$, a is the ratio of shares placed to shares outstanding after the placement, P_{mkt} is the market price at the day prior the event window and, P_{pl} is the offered price as stated at the placing prospectus/ news report.

Finally, according to the speculation hypothesis (*H5b*), the reversal takes place immediately after the issue day. Hence, the *AR* paths around both days, announcement and issue day, are important. Note that the time between the announcement and issue day is approximately 3 weeks to 1 month. This translates into 15-21 trading days. Although the announcement day is available for each placing in the sample, the relevant information about the issue day is available only for approximately 75% of the sample. However, even when the remaining 25% is excluded from the pertinent analysis, results remain qualitatively unchanged.

6.4.2. Long-horizon abnormal returns and model specification tests

While the five testable hypotheses (overreaction, pseudo-timing, liquidity/risk adjustments, other information and speculation) assume *AR* reverse during the long-run, a growing literature on how to measure long-run *AR* suggests that the reversal might be attributed to model misspecifications rather than the event (see Chapter 3). This raises the question on whether the *AR* reversal is attributable to the private placement or to the inability of the model to assess *AR* correctly. Thus, the need for several event-study applications and alternative methods for robust inferences is essential. This study applies various long-run approaches as follows.

6.4.2.1. Buy-and-hold abnormal returns [BHAR]

The first long-run event-study employed follows the suggestion of Barber and Lyon (1997) and estimate *BHAR* for three years after the offer. Three non-placing firms for each firm are chosen, having as criteria a similar 1) enlarged market value of equity (size), 2) size and industry and, 3) size and BTM. The null hypothesis of zero *BHAR* is examined under the conventional t-tests, skweness adjusted t-test (Lyon et al., 1999) and Wilcoxon non-parametric z-score values.

$$BHAR_{j,t,T} = \frac{1}{N}\left\{\left[\prod_{t=\tau}^{T}\left(1+R_{j,t}\right)-1\right]-\left[\prod_{t=\tau}^{T}\left(1+E(R_{i,t})\right)-1\right]\right\} \qquad \text{Eq. 6:3}$$

6.4.2.2. Calendar-time-abnormal returns [CTAR]

As *BHAR* may not adequately account for potential cross-sectional dependence in returns (among others see Fama, 1998; Mitchell and Stafford, 2000), *CTAR* are estimated, which are reported to overcome this problem in non-random samples. *CTAR* also serve the pseudo-timing hypothesis. The Fama and French (1995) three-factor and Carhart (1997) four-factor models are applied, after constructing equal and value-weighted calendar-time portfolios.

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{p,t} \qquad \text{Eq. 6:4}$$

$$R_{p,t} - R_{f,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + p_p PR1YR_t + e_{p,t} \qquad \text{Eq. 6:5}$$

The method of estimation of *BHAR, CTAR* and biases of long-horizon *AR* are as described in section 5.4.1.[56]

6.4.2.3. Pre-event momentum adjusted calendar-time AR [Adj.CTAR]

Given the sensitivity of *AR* on the methodology employed (see Chapter 3) and the evidence that placing firms overperform the years prior the offer (Loughran and Ritter, 1997; Hertzel et al., 2002; Chapter 5), highlight the need to control for pre-event momentum strategies. This is also consistent with the Fama and French (1996) argument that the regression intercept might be biased due to prior momentum strategies and, the Chan et al. (1996) finding that stocks with post-event abnormal

[56] The only difference is the removal of delisted event-returns after the delisting month, as an additional robustness test for the thesis. Results are qualitatively similar (see Table 5.2 and Table 6.3).

performance indicate pre-event abnormal momentum. Similar arguments are suggested by Lee and Swaminathan (2000) that test the effects of price momentum and trading volume combinations to post-event *AR*. Boechme and Sorescu (2002, p. 878) also state that 'failing to adjust for momentum may lead to misleading inferences)

To control for pre-event momentum, the *CTAR* are adjusted by creating a control calendar-time portfolio, where each event-firm is matched based on size and momentum in the spirit of Boehme and Sorescu (2002). The chosen non-event firm is the one with the closest momentum, restricted to firms with size limits equal to ±40% of the event firm. Momentum is defined as the pre-event holding period annual return. Such adjustment controls not only for the momentum strategies, but also for the possibility that placing firms time the offering when they overperform. The pre-event momentum adjusted *CTAR* (*adj.CTAR*) derive by regressing the return of a portfolio that shorts to event firms and long to matched ones, over the FF-3factor and Carhart-4factor models.

$$R_{p,t} - R_{control,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + e_{j,t} \quad \text{Eq. 6:6}$$

$$R_{p,t} - R_{control,t} = a_p + b_p(R_{M,t} - R_{f,t}) + s_p SMB_t + h_p HML_t + p_p PR1YR_t + e_{j,t} \quad \text{Eq. 6:7}$$

6.4.2.4. Pre-event momentum adjusted event-time AR

As calendar-time approach assumes the loadings are constant over the tested period, whereas they are actually time-varying (Loughran and Ritter, 2000) (the factors are rebalanced every month when firms enter and exit the calendar portfolios), the study accounts for potential time-variance bias, in manner similar to Loughran and Ritter (1995) and Boehme and Sorescu (2002). A time-series regression against the FF-3factor and Carhart-4factor models is run for each event firm, over the tested period (36 months following the event). The equal and value weighted cross-sectional mean intercept a_j represents the abnormal performance. The same procedure is replicated for each of the pre-event momentum control firms. The difference between the event and control mean intercepts reflects the adjusted *AR*. The null hypothesis is zero adjusted *AR*.

6.4.2.5. *Liquidity-adjusted abnormal returns [LQAR]*

The final approach takes a step beyond the conventional event-study methods. Given the evidence that liquidity pricing models have high predictive ability to forecast stock returns, the study applies a liquidity-asset pricing model. This could be considered as a complementary test for further robust inferences. If indeed liquidity risk explains the returns better in comparison with the traditional risk factor measurements and event-study approaches, nil (or fewer) long-run *AR* are expected. Hence, this approach contributes to the ongoing debate on the long-horizon event-study approaches. It also examines the liquidity hypothesis (*H6.3*) and directly investigates the arguments that the traditional asset-pricing models fail to capture for the reduction in liquidity exposure after an equity placing (Eckbo et al., 2000; Eckbo and Norli, 2005).

The Liu (2006) two-factor model is introduced [hereafter LQT-2factor model]. Liu (2006) advocates that when the market model is adjusted for liquidity, it accounts for the BTM that the FF-3factor model fails to. He also supports that the model captures more information on the cross-section variation of the expected returns and account for various dimensions of liquidity such as volume speed, transaction costs, volume quantity, as well as controls for firm characteristics such as size, BTM, distress, low price and past returns. The LQT-2factor model applied is as follows.

$$R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + q_j LIQ_t + e_{j,t} \qquad \text{Eq. 6:8}$$

LIQ is the liquidity factor, constructed in a manner similar to *SMB* and *HML*. Each month starting from July 1st, all firms are sorted in ascending order based on a liquidity proxy LM_{12}. $LM_{12} = (VO_{zero} + \frac{1/(turnover_{12m})}{Deflator}) * \frac{252}{NT}$, where VO_{zero} is the number of days with no trading over the previous 12 months. $turnover_{12m}$ is the sum of the daily volume turnover (the number of shares traded to the number of shares outstanding at the end of day *t* over the previous 12 months). It is scaled by a deflator chosen that $0 < \frac{1/(turnover_{12m})}{Deflator} < 1$.[57] The ratio $\frac{252}{NT}$ standardizes the number of trading days within a month. 252 is the average number of trading days within the 12-month

[57] Following Liu (2006), a deflator of 11,000 is used.

period (21 trading days used as average by the 12 months of the year). NT is the actual number of trading days over the prior 12 months.

The rationale of LM_{12} is as follows. By measuring the days with absence of trade over the previous 12 months, the measure emphasises on whether the stock has continues trading, delays or trading difficulties. It thus measures the speed dimension of liquidity and, controls for thin trading and/or locked-in risk. Contrary, the average volume turnover captures the quantity dimension of liquidity which ignores the fact that investors face higher liquidity risk if there is no trading. If a stock has zero volume on a particular day, the sum of volume turnover will not be affected. The turnover is unable to distinguish between frequent and infrequent trading days. Hereby, the LM_{12} measures the least liquid stocks based on the days with zero trading, but identifies the most liquid ones (among the trading days) based on the volume turnover. By standardizing with the number of trading days, the LM_{12} becomes comparable over time. Hence, LM_{12} could be seen as the 'turnover-adjusted number of zero daily volumes over the prior 252 trading days' (Liu, 2006, p. 632).

The LM_{12} is constructed for each individual firm listed in the LSE (excluding the event and financial stocks) at the end of each month for the years tested, using daily data. All firms are sorted from low to high LM_{12} on a monthly basis. As LM_{12} directly captures both, speed and quantity dimensions of liquidity, sorting the firms according to their LM_{12} is like having a dependent double sorting, i.e. with the zero daily trading (speed) and with the volume turnover (quantity). The LM_{12} is highly correlated with other liquidity measures that capture other liquidity dimensions, e.g. with that of Amihud (2002), Datar et al. (1998), Lee and Swaminathan (2000) and Amihud and Mendelson (1986).[58] Additionally, illiquid stocks are mainly small stocks with high BTM (capturing distress). On that basis, Liu (2006) argues that the LM_{12} is 'multi-dimensional'.

A mimicking factor portfolio LIQ that captures the liquidity premium is then constructed. Precisely, two portfolios that are rebalanced twice a year are formed

[58] Amihud (2002) uses a return-to-volume measure (price impact of liquidity), Datar et al. (1998) and Lee and Swaminathan (2000) use daily volume turnover measures (quantity) and Amihud and Mendelson (1986) use an average measure of daily bid-ask spread (transaction cost).

based on the LM_{12}. The difference between the returns of the firms belonging to the high illiquidity portfolio (above the 35% of LM_{12}) minus the returns of the firms in the low illiquidity portfolio (below 15% of LM_{12}) consists of the monthly risk factor *LIQ*.[59] The *LIQ* factor should be able to capture at least the same information as the previous models and it is comparable to the *SMB* and *HML* of the FF-3factor model. It also accounts for various risk measures. The LQT-2factor model is used as benchmark to estimate *CTAR*, momentum adjusted-*CTAR* and event-time *AR* similar to the FF-3factor and Carhart-4factor model applications.

6.4.3. Risk-factors and changes in the expected cost of equity

As all of the above *AR* methods estimate the benchmark returns based on pre-event firm characteristics, it is likely that the models ignore any post-event firm changes (*H6.3*). The study addresses the possibility that the methods used do not properly account for risk, by decomposing the cost-of-equity into pre-event and post-event periods (Boechme and Sorescu, 2002). For each event firm, a time-series regression is run over the FF-3factor, Carhart-4factor and LQT-2factor asset pricing models, for the period of ±36 months surrounding the announcement month. The pre- and post-announcement monthly returns are distinguished with the inclusion of a binary variable *D*, that takes one for the event month and onwards, and zero otherwise.

$$R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + s_j SMB_t + h_j HML_t + a_{\Delta j} D_t + b_{\Delta j} D_t * (R_{M,t} - R_{f,t}) + s_{\Delta j} D_t * SMB_t + h_{\Delta j} D_t * HML_t + e_{j,t} \quad \text{Eq. 6:9}$$

The coefficients $b_{\Delta j}, s_{\Delta j}, h_{\Delta j}$ gather the main interest of the analysis, as they capture the post-event change in the corresponding risk factor loadings. The cross-sectional mean coefficient of each of the three change coefficients $(b_{\Delta j}, s_{\Delta j}, h_{\Delta j})$ reflects the change in the risk loadings (the null hypothesis is zero cross-sectional mean). If the average $b_{\Delta j}, s_{\Delta j}, h_{\Delta j}$ are significantly far from zero, e.g. positive, it would suggest significant increase in the risk factor loadings after the event (and vice versa).

[59] According to Liu (2006, p. 650) the 15% to 35% breakpoints are more or less equivalent to 30% to 30% breakpoints used in the FF-3factor and Carhart-4factor models in terms of market value into the particular portfolios. He documents that the performance of the *LIQ* factor is not sensitive to different breakpoints. Indeed, the allocation of the firms within the *LIQ* portfolios in this study is roughly the same as in *SMB* and *HML*.

Assuming the asset-pricing model is able to capture the cross-sectional variation of the expected returns, these three estimated coefficients can be used to assess changes in the expected rate of return on equity. Each of the three cross-sectional mean coefficients $(b_{\Delta j}, s_{\Delta j}, h_{\Delta j})$, is multiplied by the mean monthly realization of the corresponding risk factor $[mean(R_M - R_f), mean(SMB), mean(HML)]$ during the years tested (1998-2005). The sum of the three products represents the monthly change in the required cost of equity, between the pre- and post-announcement periods.

When the coefficients $b_{\Delta j}, s_{\Delta j}, h_{\Delta j}$ for each event-firm (not the cross-sectional mean) are multiplied by the mean monthly corresponding factors $[mean(R_M - R_f), mean(SMB), mean(HML)]$ and then sum the three products for each firm, it provides a distribution of the monthly change in the cost of equity. The cross-sectional mean of the distribution is the same as using the cross-sectional mean loadings. It however allows for tests of statistical significance of the monthly risk changes and their relation to the post-offer *AR*.

The monthly risk changes are also examined under the Carhart-4factor and LQT-2factor models in similar manner. Hence, not only the changes in the size and *BTM* as risks factors are investigated, but also the change in momentum and illiquidity.

6.5. Sample

6.5.1. Sample collection

The sample consists of 230 UK placings announced during the years 1998–2005 (as in section 4.5.1). As this period and market have not been examined by prior literature, the study also investigates whether the 'anomaly' is not market specific. 'It is real if it is observed in different periods' (Fama, 1998, p.300).

Recall that the sample is collected after reading line-by-line the announced equity placements of LexisNexis news reports and satisfies the following selection criteria. (i) New shares are issued but the existing shareholders do not maintain pre-emptive rights to subscribe for the new shares on a pro-rata basis. (ii) Placings accompanied by pre-emptive offer or involve financial firms are excluded. (iii) All placements

involve ordinary shares. (iv) Firms are listed in the LSE or AIM, and are available into DataStream database. (v) The placing offered price, number of placing shares and the announcement day are available or assessable from other sources. The placing information is cross-confirmed using the announcement lists of Perfect Information database.

Table 6.1: Sample description

The table presents descriptive statistics of the private placing sample. The firm size is defined as the market price multiplied by the shares outstanding. It is the average market value during the three month period following the announcement, to ensure the new share issue inclusion. The proceeds represent the total gross proceeds collected from the private placing. It is defined as the placing price multiplied by the number of placing shares. The firm size and proceeds are in millions of sterling pounds. $AR_{pre\text{-}offer}$ is the holding-period return over the previous one year, based on a control non-event firm with similar size and industry. The *Discount* is a percentage of the market value, calculated as the difference between the prevailing market price as at the day t (t=0 is the announcement day) and the placing price (collected from the news report/prospectus), scaled by the market price. The discount and $AR_{pre\text{-}offer}$ are examined under the null hypothesis of zero mean and median. *OffSize* is the relative offered size defined as the number of shares placed as a percentage of the existing shares outstanding.

	Firm Size (millions)	Proceeds (millions)	OffSize	Discount	$AR_{pre\text{-}offer}$
Panel A: Full sample					
N	230	230	230	230	207
Mean	1309	73	0.22	0.10***	0.38***
Median	48	7	0.15	0.07***	0.16***
St.Dev	8085	374	0.22	0.18	1.44
Min	0.28	0.02	0.0002	-0.42	-2.90
Max	114381	4200	1.50	0.76	7.80
Panel B: Investment news					
N	99	99	99	99	88
Mean	2100	93	0.207	0.09***	0.38***
Median	81	12	0.157	0.06***	0.23***
St.Dev	11842	379	0.179	0.17	1.35
Min	0.72	0.14	0.002	-0.42	-2.90
Max	114381	3500	0.848	0.76	5.58
Panel C: Operating news					
N	98	98	98	98	90
Mean	484	63.8	0.258	0.13***	0.30**
Median	31	4.2	0.157	0.08***	0.06
St.Dev	2215	427	0.273	0.20	1.36
Min	0.28	0.02	0.002	-0.42	-2.45
Max	19729	4200	1.503	0.76	7.80
Panel D: Investment vs. Operating					
Mean	1616.4	29.2	-0.05	-0.04	0.08
Median	49.84***	7.8***	0.00	-0.02	0.17

***, **, * indicate statistical significance at 1%, 5% and 10% level respectively

6.5.2. Sample characteristics

Table 6.1 provides a brief descriptive of the sample (more details are provided in sections 4.5.2 and 5.5.1). The mean (median) size of firms participating to the private

placement is 1.3 (0.048) billions of sterling pounds, whist the gross proceeds collected is 73 (7) millions. The firms place approximately 22% (15%) of their enlarged share capital, at discount of about 10% (7%). The discount is statistically significant at the 1% level and consistent with the SEO empirical evidence (Hertzel and Smith, 1993; Wruck, 1989; Barclay et al., 2007). Firms tend to overperfom their benchmarks during the period prior a private placing (Hertzel et al., 2002). The placings document significant mean (median) *BHAR* for the year prior the offer of +38% (16%). This is again consistent with prior literature.

Given that one of the interests of this chapter is to investigate the impact of the information environment around the placing, Panels B and C distinguish the sample based on other information released at the announcement. They are classified to 'investment news' and 'operating news', as explained in section 6.3.4. Examining the characteristics of the firms participating into the two groups might indicate differences in their levels of asymmetric information and implications related to the event. Hence, they might help in explaining their *AR* paths.

The 'investment news' sub-sample documents mean (median) enlarged market value of 2.1 (0.081) billions, which is approximately 4.3 (2.6) times larger than that of the 'operating news' of 0.5 (0.031) billions. Similarly, the proceeds collected from the 'investment news' sample is approximately 1.5 (2.9) times more. This difference is reasonable considering the purpose of the placing and the use of the funds (and it is statistically significant at the 1% level). The firms belonging to the 'investment' news are larger, suggesting lower asymmetric information.

6.6. Findings and discussion

6.6.1. Evidence on abnormal performance

6.6.1.1. Announcement market reactions

Table 6.2 describes the market reactions around the announcement and issue day. Consistent with the empirical evidence, announcement *AR* are significantly positive. The mean (median) *CAR* for the full sample is +3.5% (+0.6%) for the 3-day window (-1, +1), statistically significant at the 5% level. Over the longer 11-day window (-5,

+5) the *CAR* becomes higher to 4.4%, significant at the 10%. Nonetheless, during the three days prior the announcement (-3, -1), the median *CAR* is significantly -0.06%. Although its economic value is small, it could imply sign of information leakage.

When the announcement reactions are adjusted for the mechanical dilution in the stock price due to the issuance shares at a price different than the market one, CAR_{adj} becomes higher. Mean (median) $CAR_{adj.}$ is +10.1% (+2.5%) and 9.5% (+1.3%) for the (-1, +1) and (-5, +5) windows respectively, significant at the 1% level. Regarding the (+1, +3) window, the adjusted reactions are also significantly positive of +7.9% (1.6%). Thus, the market reacts positively to the placement announcement, suggesting expectations for value improvements. This is consistent with the empirical evidence (Hertzel and Smith, 1993; Wruck, 1989; Wu et al., 2005).

➢ *Investment vs. Operating news*

Panels B and C distinguish the sample based on the information released along the placing announcement. Both sub-samples document significantly positive $CAR_{adj.}$ consistent with the view that the market expects value improvements and receive the news as 'good'. This implies that the investment sample involves positive NPV projects (*H6.4a*), for which value improvements are expected. Hereby, the hypothesis of negative NPV project and overinvestment (*H6.4b*) is rejected. Likewise, the 'operating news' sample signals expectations for improvements due to the reorganization plans of the firms (*H6.4c*). Therefore, the hypotheses of the fund raising being a typical procedure (*H6.4d*) and the market being unable to understand the placing implications (*H6.4.e*) are rejected.

Comparing the two groups of firms, the means $CAR_{adj.}$ for the 'investment news' sub-sample is lower in comparison to the 'operating news'. The $CAR_{adj.}$ for the 'operating news' sample reaches to 14.1% (3.1%) and 13.4% (3%), while the $CAR_{adj.}$ for the 'investment news' sample is 6% (1.7%) and 7.3% (2.6%) for the 3-day and 11-day windows, respectively.

Table 6.2: Market reactions around the announcement and issue day

The table presents the *AR* around the event. The cumulative abnormal returns are estimated as: $CAR_{j,T}=\sum_{t=1}^{T}AR_{j,t}$, where $CAR_{j,T}$ is the cumulative abnormal return over the tested period T tested. $AR_{j,t}$ is the abnormal return of the placing stock j, over the day t, calculated as the difference between the event return $R_{j,t}$ and the market return $R_{mkt,t}$ over the same day. $R_{mkt,t}=\ln(\frac{V_{mkt,t}}{V_{mkt,t-1}})$, where $\ln(V_{mkt})$ is the natural logarithm of the market value V_{mkt} over the index$_{(FTSEALL)}$, (DS item MV) on day t and t-1 respectively (t=0 corresponds to the announcement day). $R_{j,t}$ is estimated as $R_{j,t}=\frac{(P_{j,t}+Div_{j,t}-P_{j,t-1})}{P_{j,t-1}}$, where $P_{j,t}$ is the unadjusted market price for each day t ($P_{j,t-1}$ is its lag) as recorded on the day (DS item UP). 23 event-firms have the ex-dividend day close to the private placement announcement, within the (-5, +5) window. Therefore, $R_{j,t}$ are ex-dividend adjusted returns. $Div_{j,t}$ represents the unadjusted cash income dividend payment, based upon the dividend at the ex-dividend day (DS Item UDDE). To be consistent with the index return calculations, event returns are also assessed using the natural logarithms of the prices, $R_{j,t}=\ln(\frac{P_t+Div_t}{P_{t-1}})$, but results are qualitatively similar.

Adjusted *CAR* are defined as $CAR_{adj,j,T}=[1/(1-a)][CAR_{j,T}]+[a/(1-a)][(P_{mkt}-P_{pl})/P_{mkt}]$. Where, $CAR_{adj,j,T}$ is the discount adjusted cumulative abnormal return; $CAR_{j,T}$ is the announcement *AR*; a is the ratio of shares placed to shares outstanding after the placement; P_{mkt} is the market price of the event security j at the day prior the event window; and P_{pl} is the placement price as collected from the news report / prospectus. $CAR_{j,T}$ and $CAR_{adj,j,T}$ are examined under the null of zero means and medians. The test statistics and z-scores are presented in brackets.

	ANNOUNCEMENT DAY							*ISSUE DAY*			
	CAR				***adjsuted CAR***			***CAR***			
Window:	**(-5,+5)**	**(-3,-1)**	**(-1,+1)**	**(+1,+3)**	**(-5,+5)**	**(-1,+1)**	**(+1,+3)**	**(-5,+5)**	**(-3,-1)**	**(-1,+1)**	**(+1,+3)**
Panel A: Full sample											
N	230	230	230	230	230	230	230	171	171	171	171
Mean	0.044	-0.002	0.035	0.027	0.095	0.101	0.079	0.001	-0.004	-0.006	0.004
[t-test]	[1.914]*	[-0.355]	[1.895]**	[1.415]	[3.452]***	[3.742]***	[3.782]***	[0.105]	[-0.671]	[-0.963]	[0.756]
Median	-0.001	-0.006	0.006	-0.001	0.013	0.025	0.016	0.002	0.002	0.004	0.006
[z-value]	[-0.36]	[-2.453]**	[-1.350]	[-3.576]***	[-2.56]**	[-3.97]***	-3.838]***	[-0.160]	[-0.308]	[-0.409]	[-1.997]**
Panel B: Investment news											
N	99	99	99	99	99	99	99	73	73	73	73
Mean	0.004	0.004	0.018	-0.012	0.060	0.073	0.044	0.010	-0.004	0.011	0.015
[t-test]	[0.252]	[0.727]	[1.382]	[-1.778]*	[1.763]*	[3.011]***	[1.907]*	[0.88]	[-0.378]	[1.441]	[2.567]**
Median	0.005	-0.004	0.005	-0.002	0.017	0.026	0.018	0.000	0.002	0.005	0.009
[z-value]	[-0.115]	[-0.387]	[-1.197]	[-1.679]*	[-1.829]*	[-2.848]***	[-1.707]*	[-0.160]	[-0.308]	[-0.409]	[-1.997]**
Panel C: Operating news											
N	98	98	98	98	98	98	98	80	80	80	80
Mean	0.084	-0.001	0.041	0.058	0.141	0.134	0.113	-0.002	-0.002	-0.015	-0.010
[t-test]	[1.867]*	[-0.195]	[1.239]	[1.415]	[2.887]***	[2.54]**	[2.946]***	[-0.084]	[-0.378]	[-1.514]	[-1.177]
Median	0.004	-0.008	0.009	0.000	0.031	0.028	0.022	0.004	0.002	0.008	0.003
[z-value]	[-0.944]	[-1.972]**	[-0.735]	[-2.929]***	[-2.124]**	[-2.567]**	-3.308]***	[-0.451]	[-0.480]	[-0.067]	[-0.201]

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively.

Similar reactions are noted for the 3-day window following the announcement (+1, +3). The $CAR_{adj,}$ for the 'operating news' is 11.3% (2.2%), whilst for the 'investment

news' is only 4.4% (1.8%). These $CAR_{adj.}$ imply that the market might expect higher improvements for firms included in the 'operating news' sub-sample due to their reorganization plans. They might signal ability to explore potential opportunities and strength their financial position. However, the difference between the reactions of the two sub-samples is statistically significant only when means are examined, at the 5% and 1% levels. Their medians are not statistically far from zero. Whether any or both sub-samples document *AR* reversal during the long-run is tested in Table 6.3.

6.6.1.2. The speculative hypothesis and market reactions around the issue day

The speculation hypothesis predicts that the reversal takes place immediately after the issue of the new stock. Hence, significant negative *AR* immediately after the issue day should be reported. Nonetheless, the *CAR* are not far from zero. The market does not expect further value changes. Considering that the market is already informed about the placing approximately three weeks before the issue, the new information is incorporated into the market prices. Only the 'investment news' sub-sample documents significant *CAR* for the 3-day window following the issue (+1, +3), of +1.5% (0.09%). However, it is positive rather negative as the speculation hypothesis predicts.

As a robustness test, the study follows the Lease et al. (1991) suggestion and examines longer windows up to three months following the event. *AR* do not become significantly negative. The selling pressure is also examined by measuring bid and ask *AR* (Lease et al., 1991; Conrad and Conroy, 1994; Altinkilic and Hansen, 2007), however they also follow the same path as the reported *AR*.

Hereby, investors with long positions do not sell immediately after the issue to take advantage of the positive market reactions and yield higher *AR*. There is no selling pressure immediately after the issue that could cause reversal in *AR*. These findings reject the speculative hypothesis. Even if speculation does take place, it does not seem able cause *AR* to reverse.

6.6.1.3. Long-run abnormal performance

Table 6.3 presents the long-horizon performance three years following the placings. It controls for several biases associated with long-run *AR* and, addresses the model misspecification problem that long-horizon *AR* are sensitive to the methodology employed. The table additionally facilitates in examining the remaining hypotheses.

Precisely, the mean (median) *BHAR* varies from -15.2% (-14.5%) to -35% (-15%) depending on the benchmark used (Panel A). The size benchmark provides a -33% (-11%) *BHAR*. The conventional t-test, skewness adjusted t-test (Lyon et al., 1999) and Wilcoxon z-score suggest statistically significant underperformance at the 5% level. The size and industry matching documents *BHAR* of -15% significant at the 5% and10% levels. Having a size and BTM benchmark, the *BHAR* is -34.6% (-15%).

Underperformance is also reported when pre-event momentum adjusted *AR* are measured for each firm over the FF-3factor, Carhart-4factor and LQT-2factor models. Panel B displays the cross-section mean coefficients of the equal-weighted portfolio models. The FF-3factor model documents momentum adjusted *AR* of -8.1% over the three years following the event, statistically significant at the 1%. The Carhart-4factor model suggests deeper underperformance of -25.8%, however statistically insignificant. The LQT-2factor model reports lower *AR* equal to -4.8%, statistically significant at the 1% level. Likewise, the value-weighted firm-specific *AR* are also negative (panel C). The FF-3factor documents -6.7%, the Carhart-4factor -5.1% and the LQT 2-factor -7.2% *AR*, all statistically significant at the 1% level. Therefore, although the firm pre-event momentum adjusted regressions document smaller long-run *AR*, they are still negative and statistically significant.

Moreover, panels D and E display the intercept coefficients after constructing calendar-time event portfolios, regressed over the three asset-pricing models (FF-3factor, Carhar-4factor, LQT-2factor). Specifically, when the portfolios are equally weighted, the unadjusted intercept of the FF 3-factor model is -0.5% per month, which translates into -17% holding *AR* over the 36-month period tested, statistically significant at the 10% level. The Carhart-4factor documents insignificantly positive monthly *AR* of +0.7%. The LQT-2factor also suggests positive monthly *AR* of +1.1% statistically significant at the 1% level, which translates to +49% over the three years.

Table 6.3: Long-horizon abnormal performance

Panel A presents the buy-and-hold abnormal returns (*BHAR*), for a period of 3 years following the event, assessed on a monthly basis for the months (0, +36) after the event. *BHAR* on each event firm *j* is the difference between its BHR_j and the *BHR* of a benchmark non-event firm, over the same period of time: $BHAR_{j,\tau,T} = \left[\prod_{t=\tau}^{T}(1+R_{j,t})-1\right] - \left[\prod_{t=\tau}^{T}(1+E(R_{i,t})-1\right]$. R_t is the monthly stock return, which equals the monthly price (P_t-P_{t-1}) and dividend (Div_t) return, scaled by the market price (P_t). P_t is the adjusted market price as at the 1st day of each month included in the event window (DS item *P)*. Div_t represents dividend payments granted within the month *t* (DS item DY). Event firms are matched based on their market value of equity (MV), market value and industry (MV+Ind) and, market value and book-to-market (MV+BTM). The brackets include the conventional t-tests, skweness adjusted (Lyon et al., 1999) and Wilcoxon z-score values. Panels B and C present event-time *AR*. The return of each firm is run against the the Fama and French (1993, 1995) three-factor model [FF-3factor], the Carhart (1997) four-factor model [Carhart-4factor] and the Liu (2006) two-factor [LQT-2factor] asset pricing model. The portfolios are formed with equal and value weights, for period +36 following the event. The cross-sectional intercept of each model represents the average *AR* for the period tested for the event sample. Each event firm is matched with a control firm based on size and momentum. Momentum is defined as the pre-event holding period annual return. The difference between the event and momentum-control intercepts reflect the adjusted *AR*. The implied *AR*, is the monthly intercept translated to holding period return, $[(1+AR)^{36}-1]$.

Panels D and E present the calendar-time abnormal returns (*CTAR*) using the three, four and two-factor models. An event portfolio *p* is formed, including the stocks that have been involved to the private placing in the previous 36 months. The intercept α_p reflects the average monthly *AR*. To control for severe heterocedasticity at least 10 event-firm returns are required in each event portfolio. The adjusted *CTAR* derive by regressing the difference between the monthly event and momentum-control firm return, over the two, three and four factor models.

Panel A: Buy-and-hold abnormal returns (event-time BHAR)

	"Full sample"			*"Investment news"*			*"Operating news"*		
	MV	MV+Ind	MV+BTM	MV	MV+Ind	MV+BTM	MV	MV+Ind	MV+BTM
N	121	121	96	55	55	47	50	50	39
Mean	-0.327	-0.152	-0.346	-0.073	-0.210	-0.102	-0.571	-0.079	-0.765
Median	-0.107	-0.145	-0.150	-0.080	-0.185	-0.061	-0.221	-0.151	-0.440
[convensional t-test]	[-1.96]**	[-1.65]*	[-2.55]**	[-0.309]	[-1.122]	[-0.531]	[-1.888]*	[-0.362]	[-2.28]**
[skewness adj. t-test]	[-2.07]**	[-1.10]	[-0.67]	[-0.308]	[-1.106]	[-0.529]	[-1.898]*	[-0.371]	[-2.282]**
[Wilcoxon z-value]	[-2.146]**	[-2.428]**	[-1.645]*	[-0.327]	[-1.642]	[-.032]	[-2.109]**	[-1.688]*	[-2.051]**

Panel B: Equal weighted preevent momentum adjusted AR (event-time)

	FF-3factor	Carhart-4factor	LQT-2factor	FF-3factor	Carhart-4factor	LQT-2factor	FF-3factor	Carhart-4factor	LQT-2factor
N	186	186	186	76	76	76	82	82	82
Cross-sectional α	-0.002	-0.008	-0.001	-0.003	-0.006	-0.002	-0.002	-0.018	-0.001
[t-statistic]	[-3.906]***	[-1.442]	[-2.843]***	[-2.768]***	[-1.204]	[-2.106]*	[-1.886]*	[-1.576]	[0.868]
Implied 3-year AR	-0.081	-0.258	-0.048	-0.097	-0.193	-0.066	-0.060	-0.481	-0.019

Panel C: Value weighted preevent momentum adjusted AR (event-time)

N	186	186	186	76	76	76	82	82	82
Cross-sectional α	-0.002	-0.001	-0.002	-0.003	-0.002	-0.003	-0.001	0.000	-0.002
[t-statistic]	[-3.413]***	[-2.785]***	[-3.402]***	[-2.547]**	[-2.603]**	[-2.286]**	[-1.346]	[0.502]	[-1.83]*
Implied 3-year AR	-0.067	-0.051	-0.072	-0.101	-0.081	-0.090	-0.029	-0.013	-0.053

Panel D: Equal weighted calendar-time abnormal returns (CTAR_ew)						
	FF -3 factor		Carhart - 4 factor		LQT- 2 factor	
	Unadj.	*Adj.*	*Unadj.*	*Adj.*	*Unadj.*	*Adj.*
N Obs	114	115	114	119	112	113
R^2	0.879	0.331	0.879	0.269	0.848	0.122
Intercept (a)	-0.0052	-0.0074	0.0071	-0.0233	0.011	-0.0003
[t-statistic]	[-1.74]*	[0.59]	[0.32]	[1.08]	[3.93]***	[3.12]***
Implied 3-year AR	-0.171	-0.235	0.290	-0.572	0.490	-0.012
Panel E: Value weighted calendar-time abnormal returns (CTAR_vw)						
N Obs	113	111	113	111	110	113
R^2	0.418	0.106	0.414	0.120	0.338	0.031
Intercept (a)	-0.028	-0.018	-0.027	-0.014	0.005	-0.007
[t-statistic]	[-2.34]**	[1.13]	[-2.31]**	[-1.39]	[0.63]	[1.19]
Implied 3-year AR	-0.646	-0.476	-0.627	-0.394	0.218	-0.213

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

Nonetheless, weighting equally is biased towards the performance of small firms (Mitchell and Stafford, 2000), and *CTAR* with equal weights might not be able to appropriately capture post-abnormal performance when the management time the offer at particular periods (see sections 3.4.2 and 3.4.4). Hence, value-weighting should be more accurate. The unadjusted value-weighted *CTAR* for the FF-3factor and Carhart-4factor models are -2.8% and -2.7% per month, statistically significant at the 5% level. This translates to approximately -64% and -62% underperformance over the three years, respectively. Nevertheless, controlling for the liquidity risk factor, the *AR* reversal seems to disappear as the LQT-2factor indicates normal monthly *AR* of 0.5%.

In addition, when the models adjust for pre-event momentum the significant *CTAR* disappears completely. The traditional *CTAR* models (FF-3factor and Carhart-4factor) do not under-perform when they control for pre-event momentum. Note that the liquidity-adjusted *CTAR* do not support the reversal with or without pre-event momentum adjustments. Hereby, as the sings of *AR* are not always significantly negative it implies sensitivity to the method used.

6.6.1.4. *Discussion on the AR paths in relation to the predictions of the testable hypotheses*

➢ *The AR reversal in UK*

Recall that the announcement market reactions for the full sample are significantly positive (Table 6.2). As the conventional long-run *AR* measurements (e.g. *BHAR*, unadjusted *CTAR*) document significant *AR*, this is consistent with the private placing reversal puzzle.

➢ *Pseudo-timing*

The fact that the placings in this study cluster by time supports the pseudo-timing hypothesis. Specifically, approximately 57% of the sample takes place at years 2004 and 2005.[60] Second, according to the pseudo-timing hypothesis the post-offer underperformance should be observable mainly for event-time *AR* (Schultz, 2003). In a calendar-time form, long-run *AR* are to be lower. Indeed, the event-time *BHAR* (panel A) suggest deeper underperformance in comparison with the traditional unadjusted *CTAR*. Hertzel et al. (2002, Table II) also report lower *CTAR* in comparison with *BHAR*, following US private placements. This suggests that pseudo-timing could explain the reversal rather than overreaction. Thus, pseudo-timing could be an alternative interpretation of their findings.

When the event-time *AR* are adjusted for pre-event momentum, they become smaller than the traditional *CTAR* (see Table 6.3, panels B and C). However, they are still higher than the adjusted *CTAR* (see adjusted *CTAR*; Table 6.3, panels D and E). Only the LQT-2factor adjusted *CTAR* (equal weights) report small underperformance of -1.2% over the three-year period. However, this is again smaller than the adjusted event-time *AR* of -10% reported in panel B. Value weighting adjusted *CTAR* are statistically insignificant. These findings are consistent with the pseudo-timing hypothesis, while they are also consistent with the view that results are sensitive to the methodology and model misspecification problems.

[60] More specifically, 9% of the placings take place in 1998, 7% in 1999, 10% in 2000, 4% in 2001, 4% in 2002, 18% in 2003, 23.5% in 2004 and 23.5% in 2005.

➢ *Liquidity and (other) model misspecifications*

Deviating from the conventional models of long-run abnormal performance and controlling for the liquidity risk factor, Table 6.3 reports high ability of the liquidity-adjusted pricing model (Liu, 2006) to detect *AR*. The model reports the lowest *AR* in comparison with the other models employed (FF-3factor or Carhart-4factor). This is irrespective of the method used and whether *AR* are event-time *AR*, *CTAR* or *BHAR*.

In fact, value-weighted liquidity adjusted-*CTAR* are not statistically significant. When the equal-weighted liquidity adjusted-*CTAR* are adjusted for pre-event momentum, they report underperformance which has very small economic value over the three-year period (-1.2%). It could thus be argued that the reversal actually is eliminated (especially if macroeconomic or other factors suggested by prior studies (e.g. Eckbo et al., 2000; Lee and Masulis, 2009) are directly taken into account). The findings confirm the Eckbo et al. (2000) and Eckbo and Norli (2005) suggestion that liquidity is a significant factor in long-run *AR* following SEO.

Illiquidity by itself might not be able to completely explain the reversal as the model provides some significant *AR* in event-time form (see panels B and C). Nevertheless, the abnormal performance is less in comparison with the other two models. These results suggest that illiquidity and pricing models beyond the conventional ones should be used in long-run abnormal performance and are able to explain the variation in expected returns better.

➢ *Investment vs. operating news sub-samples*

Panels A, B and C of Table 6.3 classify the sample based on the additional information released along the announcement.[61] The *BHAR* for the 'investment news' sub-sample are negative but not statistically far from zero. Nevertheless, the pre-event momentum adjusted event-time *AR* document significant three-year underperformance of about -10% over the FF-3factor model (equal and value weighted), -8% over the Carhart-4factor (value weighted) and -7% to -9% over the

[61] The requirement of at least 10 firms into each monthly placing portfolio restricts further classification into 'investment' and 'operating' news when measuring *CTAR* following the private placements.

LQT-2factor model (equal and value weighted, respectively). Hence, the 'investment news' sub-sample appears to be subject to the puzzling reversal of *AR*.

Likewise, the 'operating news' sub-sample documents significantly negative *BHAR* based on the size and, size and BTM matched firms. It additionally displays marginally significant underperformance of -6% over the FF-3factor (equal weighted only) and LQT-2factor (value weighted only), at the 10% level.

While both sub-samples are likely to document *AR* reversal, the results are not clear. The *AR* are not always significantly negative, while the differences between the long-run *AR* of the two sub-samples are not significant. Rather, they depend on the benchmark model. This holds for both, investment and operating news sub-sample. This suggests again that the long-horizon *AR* are sensitive to the approach employed, while the other information released at the announcement does not seem able to explain the reversal.

6.6.2. Univariate analysis

6.6.2.1. Overreaction hypothesis

While the reversal and the existence of momentum effect are confirmed (*H6.1α* and *H6.1c*), to addresses the question of whether the market overreacts at the announcement (Hertzel et al., 2002), Table 6.4 examines the correlations between the short- and long-run *AR*.

The Spearman correlation coefficients between the announcement and long-run *AR* are small and mainly insignificant. The only significant negative correlations are between the adjusted *AR* for the 3-day window after the announcement (+1, +3) and the liquidity adjusted *AR*. The remaining correlation coefficients are statistically not far from zero. Normal correlations are also found when Pearson correlations coefficients are assessed, as well as correlations between the *AR* around the announcement and issue day (not shown).

This contradicts the view that the market overreacts as suggested by Hertzel et al. (2002). Hertzel et al. (2002) do document significantly negative correlations between

short and long-term returns following US private placements, however only when buy-and-hold returns are *not* adjusted for any risk factor. Announcement *CAR* and long-run *BHAR* are not significantly negatively correlated to their sample either. This implies the overreaction hypothesis might not hold, regardless the reversal of the *AR*.

Table 6.4: Correlations between short and long-run AR

The table presents Spearman correlation coefficients between short and long-horizon *AR*. *CAR* and CAR_{adj} are the cumulative abnormal returns measured as described in Table 6.2. The length of the *CAR* or CAR_{adj} window is noted in the parentheses. *BHAR*, FF-3factor, Carhart-4factor and LQT-2factor models are estimated as described in Table 6.3. P-values are in parentheses.

	BHAR (MV)	BHAR (MV+Ind)	BHAR (MV+BTM)	FF-3factor (ew)	Carhart-4factor (ew)	LQT-2factor (ew)	FF-3factor (vw)	Carhart-4factor (vw)	LQT-2factor (vw)
$CAR_{annc\,(-5,+5)}$	0.114	0.109	0.127	0.075	0.038	0.035	0.086	0.094	0.002
	(0.215)	(0.236)	(0.213)	(0.318)	(0.615)	(0.637)	(0.255)	(0.213)	(0.981)
$CAR_{annc(-3,-1)}$	0.116	0.099	0.123	0.026	0.01	0.048	0.029	0.066	0.048
	(0.206)	(0.281)	(0.227)	(0.73)	(0.894)	(0.527)	(0.697)	(0.38)	(0.524)
$CAR_{annc(-1,+1)}$	0.087	0.114	-0.013	0.094	0.037	-0.043	0.054	0.059	-0.019
	(0.342)	(0.212)	(0.903)	(0.212)	(0.62)	(0.566)	(0.47)	(0.431)	(0.8)
$CAR_{annc\,(+1,+3)}$	0.114	0.042	0.051	0.087	-0.018	0.094	-0.051	-0.008	-0.008
	(0.214)	(0.647)	(0.616)	(0.246)	(0.808)	(0.208)	(0.499)	(0.911)	(0.917)
$CAR_{adj,annc\ (-5,+5)}$	-0.078	0.048	-0.074	-0.107	-0.014	-0.115	-0.106	-0.064	-0.091
	(0.396)	(0.6)	(0.471)	(0.152)	(0.854)	(0.127)	(0.156)	(0.394)	(0.228)
$CAR_{adj,annc\,(-1,+1)}$	0.013	0.093	-0.16	-0.118	-0.059	-0.086	-0.108	-0.065	-0.097
	(0.885)	(0.312)	(0.115)	(0.116)	(0.435)	(0.251)	(0.151)	(0.386)	(0.195)
$CAR_{adj.annc\,(+1,+3)}$	0.05	0.115	0.088	-0.097	0.004	-0.153	-0.087	-0.08	-0.185
	(0.587)	(0.207)	(0.39)	(0.196)	(0.96)	(0.041)**	(0.247)	(0.285)	(0.013)**

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

6.6.2.2. Change in cost-of-equity and risk-factor loadings

The main findings thus far support the pseudo-timing (*H6.2*) and liquidity/risk adjustment (*H6.3*) hypotheses. The results strongly suggest that model misspecifications (*H6.3b*) significantly contribute to the reversal, as *AR* are sensitive to the approach used. This stresses out the need for deeper investigation on the adjustments in risk-factor loadings and improvements in long-run *AR* methods. Table 6.5 displays changes in the risk factors coefficients following the event.

- *Full sample*

Panel A displays the factor loadings over a long period of ±36 months surrounding the placing announcement. Consistent with the asset pricing literature, the *SMB*

factor coefficient (s_j) is positive and statistically significant for the models FF-3factor and Carhart-4factor. This confirms the positive relation of size with the expected cost of equity. Likewise, the coefficient of the illiquidity risk factor LQT (q_j) is also positive and statistically significant at the 1% level, which is in line with the view that liquidity has significant ability to predict abnormal performance. In addition, this is the first time that the model is tested for the UK market, which provides additional evidence.

Contrary, the coefficients of interest for the FF-3factor ($b_{\Delta j}, s_{\Delta j}, h_{\Delta j}$) and Carhart-4factor ($b_{\Delta j}, s_{\Delta j}, h_{\Delta j}, p_{\Delta j}$) that examine the change between the pre- and post-event periods do not report significant change in risk-factor loadings following the event. The models do not indicate significant change on the required rate of return. However, given that *AR* become significantly lower few years after the offer but the individual risk factors do not change implies the change in expected returns is driven by factors other than the beta, size, BTM or momentum that the traditional factor models capture.

Additionally, panel B displays the mean monthly realizations of the risk factors for the months around the announcement [$mean(R_M - R_f)$, $mean(SMB)$, $mean(HML)$, $mean(PR1YR)$]. They are significantly different from zero of about 0.7% for SMB, -0.2% for HML and +13% for PR1YR. Panel C estimates the average monthly change in the expected cost of equity. Similar to the change coefficients ($b_{\Delta j}, s_{\Delta j}, h_{\Delta j}, p_{\Delta j}$) any change in the expected rate of return is not significant. It equals to -0.7% and -2.85% for the FF-3factor and Carhart-4factor models respectively, but not significantly far from zero. This finding is inconsistent with the view that factors unrelated to the event cause change in the contemporaneous risk factors, which affect the firm required return on equity (Boechme and Sorescu, 2002). Contrary, the models do not seem to capture any risk change following the event.

Nevertheless, when the analysis involves the LQT-2factor model, the implications differ. Not only the risk-factor coefficients of the model are positive and statistically significant (b_j, q_j), but also the risk-factor change coefficients are negative and

Table 6.5: Risk factor loadings

The table presents the changes in risk factors, before and after the placement. A time-series regression is run for each event firm over the Fama and French (1993), Carhart (1997) and Liu (2006) asset pricing models (equal weighted), for the ±36 months surrounding the announcement month. FF-3factor is the $R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + s_j SMB + h_j HML + a_y D + b_y D_t * (R_{M,t} - R_{f,t}) + s_y D_t * SMB + h_y D_t * HML + e_{j,t}$, Carhart-4factor: $R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + s_j SMB + h_j HML + p_j PR1YR + a_y D + b_y D_t * (R_{M,t} - R_{f,t}) + s_y D_t * SMB + h_y D_t * HML + p_y D * PR1YR + e_{j,t}$, LQT-2factor: $R_{j,t} - R_{f,t} = a_j + b_j(R_{M,t} - R_{f,t}) + q_j LIQ + a_y D + b_y D_t * (R_{M,t} - R_{f,t}) + q_y D_t * LIQ + e_{j,t}$. $R_{p,t} - R_f$ is the portfolio excess return. $R_{M,t}$ is the market return at the month t, b_p is the beta of the event – portfolio. *SMB* is the value portfolio (average returns of the 'small' minus 'big' portfolios), *HML* is a growth portfolio ('high' minus 'low' growth) and *PRIYR* is a momentum factor ('winners' minus 'losers'). *LIQ* is the liquidity factor (high liquidity minus low liquidity portfolio returns). The pre- and post-announcement monthly returns are distinguished with the inclusion of a binary variable *D*, that takes one for the event month and onwards, and zero otherwise. The coefficients $b_{\Delta j}$,$s_{\Delta j}$,$h_{\Delta j}$,$p_{\Delta j}$, $q_{\Delta j}$ gather the main interest of the analysis, as they capture the post-event change in the corresponding risk factor loadings (the null hypothesis is zero cross-sectional mean). Each cross-sectional mean coefficient is multiplied with the mean monthly realization of the corresponding risk factor $[mean(R_M - R_f), mean(SMB), mean(HML), mean(PR1YR), mean(LIQ)]$ during the years tested. The sum of the three products is the monthly change in the required cost of equity, between the pre- and post-event periods. Test-statistics are in brackets.

	"Full sample"						*"Investment news"*						*"Operating news"*					
	FF 3-factor		Carhart 4-factor		LQT 2-factor		FF 3-factor		Carhart 4-factor		LQT 2-factor		FF 3-factor		Carhart 4-factor		LQT 2-factor	
Panel A: Cross-sectional average coefficients																		
N	187		187		187		76		76		76		83		83		83	
Average coefficients																		
b_j	1.326	[10.457]***	1.332	[9.795]***	1.619	[12.345]***	1.000	[6.029]***	1.558	[5.812]***	1.459	[6.800]***	1.284	[7.956]***	1.210	[7.859]***	1.744	[8.952]***
s_j	0.539	[2.027]**	0.528	[1.913]*			0.115	[0.709]	0.358	[1.065]*			1.144	[2.291]**	0.970	[2.021]***		
h_j	-0.330	[-1.564]	-0.274	[-1.147]			-0.300	[0.282]	0.250	[0.663]			-0.374	[-1.503]	-0.363	[-1.443]		
p_j			0.698	[0.809]					1.658	[0.857]								
q_j					0.589	[2.234]**					0.240	[0.500]					0.853	[2.237]**
Average change in coefficeints after the event																		
$b_{\Delta j}$	-0.159	[-0.992]	-0.159	[-0.937]	-0.345	[-2.033]**	-0.023	[-1.386]	-0.518	[-1.81]*	-0.395	[-1.566]	-0.020	[-0.085]	-0.035	-0.311	-0.384	[-1.562]
$s_{\Delta j}$	-0.431	[-1.394]	-0.432	[-1.221]			-0.050	[-0.261]	-0.065	[-0.118]			-0.914	[-1.712]*	0.109	[0.476]		
$h_{\Delta j}$	0.172	[0.602]	0.125	[0.369]			0.303	[0.563]	0.238	[0.392]			0.101	[0.291]	-0.934	[-1.693]*		
$p_{\Delta j}$			-0.172	[-0.178]					-1.650	[-0.784]					-0.007	[-0.017]		
$q_{\Delta j}$					-0.744	[-2.285]**					-0.431	[-0.748]			0.392	[0.413]	-0.884	[-1.834]*
Panel B: Intertemporal mean monthly realizations of the model factors																		
Rmkt - Rf	0.003	[0.517]	0.003	[0.517]	0.00256	[0.517]												
SMB	0.007	[2.700]***	0.007	[2.700]***														
HML	-0.020	[-4.349]***	-0.020	[-4.349]***														
PR1YR			0.130	[69.406]***														
LIQ					0.0049	[1.756]*												
Panel C: Average monthly change in the required rate of return around the event																		
	-0.007	[1.399]	-0.0285	[-0.227]	-0.0046	[-2.41]**	-0.0072	[-0.918]	-0.2213	[-0.814]	-0.003	[-0.926]	-0.0087	[-1.221]	0.0447	[0.361]	-0.0054	[-1.937]*

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

significant ($b_{\Delta j} = -0.345^{**}$, $q_{\Delta j} = -0.744^{**}$). Hence, the risk-factor loadings become significantly lower during the post-offer period.

This implies reduction in the liquidity risk which is not captured by the FF-3factor and Carhart-4factor models, consistent with the liquidity hypothesis. Moreover, the mean monthly realization of the corresponding risk factors for the months around the announcement [$mean\,(LM_{12})$] is 0.49%, statistically significant at the 10% level. Unlike the FF-3factor and Carhart-4factor models, the change-coefficient of LQT-2factor model documents reduction in the cost of equity by -0.46% per month, for the 36-month period following the event (significant at the 5% level).

The findings, thus, comply with the view that the issuers are exposed to less risk after the placing which decreases their expected returns relative to their benchmarks (Eckbo et al., 2000; Eckbo and Norli, 2005). This reduction probably derives from the fact that firms reduce the debt weight in their capital structure (deleverage) which makes them less risky. If the benchmark does not properly control for reduction in post-offer risk, the *AR* will be negatively biased.

- *Investment vs. operating news*

Recall that Table 6.3 reports mainly negative post-event long-run *AR* for the 'investment news' sub-sample, while the 'operating news' sample reports mainly normal post-performance over the three asset pricing models FF-3factor, Carhart-4factor and LQT-2factor (*BHAR* document opposite signs). The differences between the two samples are not statistically significant. However, replicating the above analysis for the two sub-samples supports the view that any differences in the reported *AR* is probably attributed to reduction in liquidity risk for the 'operating news' sample and, to sensitivity on the model used rather than other information. Hence, this section contributes further to the model misspecification hypothesis, as implied by Table 6.3.

Precisely, when the coefficients examine the change between the pre- and post-event periods ($b_{\Delta j}, s_{\Delta j}, h_{\Delta j}, p_{\Delta j}$), any change in risk-factor loadings is marginally significant. The Carhart-4factor model documents reduction in the stock beta for the 'investment

news' sample ($b_{\Delta j} = -0.518^*$), statistically significant at the 10% level. This is the only change the 'investment news' sub-sample reports.

The 'operating news' sample documents similar results in terms of being marginally significant. It however reports bigger changes. The FF-3factor model reports reduction in size risk factor ($s_{\Delta j} = -0.914^*$) and the Carhart-4factor reduction in the BTM risk factor loading ($h_{\Delta j} = -0.934^*$). The LQT-2factor model also documents significant reduction in the illiquidity risk factor following the event ($q_{\Delta j} = -0.884^*$). Interestingly, this sample also documents change in the required rate of return of -0.54% per month (see panel C), statistically significant at the 10%. This change is documented only under the LQT-2factor model, suggesting that the risk-factor loadings of the traditional asset pricing models cannot adjust for this risk change accurately.

The reduction in the expected rate of return documented by the LQT-2factor model strongly suggests that the liquidity component of the cost of equity has substantial impact on returns and cannot be captured by the traditional FF-3factor and Carhart-4factor models. Perhaps the size and BTM factors cannot capture the change in risk as they ignore transaction costs involved when attempting to explore an existing momentum.[62] Contrary, the liquidity-pricing model does capture these costs.

Employing the LQT-2factor model significantly contributes in understanding the *AR* pattern. Previous studies examining *AR* following private placements ignore changes in liquidity risks. Consequently, as the liquidity adjusted *AR* report the lowest underperformance (see Table 6.3), it appears that *only* the LQT-2factor model adjusts for liquidity risk changes that facilitates in explaining the apparent sensitivity observed in long-run *AR*.

6.6.3. Multivariate analysis

To fully explore the testable hypotheses, Table 6.6 regresses the short- and long-run *AR* over a set of explanatory variables that examine the reversal stories. The study uses variables that capture any miss-valuation, risk changes and firm timing ability (Hertzel

[62] See Malkiel (2003, p.62) which references to findings of Odean (1999) and Lesmond et al. (2004).

and Smith, 1993; Hertzel et al., 2002, Chapter 5) such as the discount offered, past performance and past *AR*-volatility. Other variables that have been widely used as asymmetric information proxies but also test the stock liquidity such as the trading volume and bid-ask spread (e.g. Wu, 2004; Corwin, 2003; Altinkilic and Hansen, 2003) are additionally used. Finally, controls for inelastic demand around the announcement (e.g. Loderer et al., 1991) and monitoring (e.g. Wruck, 1989; Wu and Wang, 2009) are essential. Appendix II describes the exact variable definitions.

As similar variables could also partly explain the discount (see Table 4.5), to control for multicolinearity a cut-off 10 of VIF test is used. The maximum VIF among the models is 7.06, suggesting no multicolinearity problems. Similar to Boechme and Sorescu (2002), Weighted Least Square (WLS) analysis is conducted, which controls for auto and/or cross-sectional dependence in *AR*. WLS compensates for violation of homoskedasticity. The *AR* are weighted with reciprocal of the residuals obtained from estimating the market model. Overall, the multivariate analysis confirms and controls for the several implications around the placings such as certification (Hertzel and Smith, 1993), liquidity and inelastic demand (Corwin, 2003; Loderer et al., 1991; Chapter 4) and monitoring (Wruck, 1989; Wruck and Wu, 2009). Controlling for the known implications helps in understanding the *AR* between the short and long-run periods. However, as the interest of the study is the reversal rather than the *AR* driving factors per se, these models mainly supplement the previous analysis.

6.6.3.1. Announcement AR explanations

Panel A presents the WLS coefficients with dependent variable the short-run *AR* around the announcement day. Model 1 documents significant negative coefficient for the offered discount of -0.637, statistically significant at the 1% level. This suggests miss-pricing (overvaluation) of the offered stock. A plausible question would be, why does the market react positively? Negative discount coefficient is also consistent with Balachandran et al. (2009, Table 9) for UK placements.

However, neither Balachandran et al. (2009) nor model 1 adjusts for the mechanical dilution in market prices attributable to the sale of stock at a price different than the market one (see section 0 for details and relevant prior literature). To control for this,

model 2 uses the adjusted discount that controls for this mechanical dilution (Eq.4:2). The negative discount coefficient becomes positive (+0.474), statistically significant at the 1% level. This supports the view that the discount signals certification (Hertzel and Smith, 1993) or monitoring (Wruck, 1989) costs.

To cover the possibility that active buyers join the firm and increase firm value (Wruck, 1989), the models uses two 'agency variables': an interaction term $\Delta concentr * D_{mgt\_turn}$ that implies intentions of the placing investors to be active and affect the firm performance. The second proxy is a binary variable that captures the possibility of strategic investors $(Str.Inv)$. $\Delta concentr * D_{mgt\_turn}$ appears positive and marginally significant at the 10% level. The coefficient however is 0.004, indicating very small economic value. Hence, there is not real monitoring expectation. This is consistent with prior evidence that post-purchase activity of SEO investors in the UK is limited (see Armitage, 2010 and Chapter 4).

In addition, the past-performance reports a significantly negative coefficient of -0.047, implying that the market does not interpret the higher past performance as a good sign. The market does not receive the private placing announcement as a signal of timing the offer when the stock is overvalued. Therefore, the model implies certification of the stock (Hertzel and Smith, 1993). The higher the discount the more positive the reactions, as the new investors have certified the stock.

In sequence, model 3 adjusts the *AR* for the mechanical dilution of offering shares at a price different than the market one (and removes the discount and relative offered size from the model). Model 3 indicates significant positive relationship between the CAR_{Adj} and bid-ask spread. The spread has a positive coefficient of 0.334, statistically significant at the 1% level. Given the positive CAR_{Adj} (Table 6.2, panel A), a positive relation to the bid-ask spread implies that investors require higher return for the liquidity premium. As the firms had high asymmetric information prior the offer (Wu, 2004), the announcement changes its information and risk levels.

Hence, the findings suggest that certification and information asymmetries drive the announcement *AR*. These results are robust to model modifications such as the inclusion of the discount and offered size as explanatory variables or exclusion of the

monitoring proxies (e.g. models 4 and 5). As a conclusion, the positive announcement market reactions are attributed to the reduction in information asymmetries between the firm and the market following the placing. The event causes reduction in the (liquidity) risk[63], while no significant evidence of monitoring can be reported. Hereby, the findings also provide behaviour finance interpretations, which are left for further research by Brav et al. (2000).

6.6.3.2. Long-horizon AR explanations

Panel B examines the effects of the control variables on long-horizon *AR*. Six models are run using the *AR* based on the three pricing models (i.e. FF-3factor, Carhart-4factor and LQT-2factor) as the dependent variable. Each model is run twice, to examine equal and value weighted *AR*. Overall, the models suggest that the reduction in the monthly rate of return due to lower liquidity risk (reported in Table 6.5) could explain the reversal.

More specifically, the models include an additional explanatory variable (compared to the announcement *AR* regressions) that capture the average monthly change in the expected cost of equity (as estimated in Table 6.5) for each model, i.e. *FF-Δmonth.risk*, *Carhart-Δmonth.risk* and *LQT-Δmonth.risk*. The three proxies capture the monthly changes in risk factor loadings of each model. Recall that section 6.6.2.2 (that describes the monthly changes in cost-of-equity due to changes in risk factor loadings) highlights that only the LQT-2factor model documents significant reduction in the liquidity risk as component of the cost of equity. The section suggested inability of the traditional pricing models to adjust for post-offer changes in liquidity risk. Panel B of Table 6.6 strengthens this view.

In particular, when *AR* derive from the LQT-2factor model, they indicate significant negative relationship with the corresponding monthly change in the expected cost of equity *LQT-Δmonth.risk* (models 10-11). The coefficient of *LQT-Δmonth.risk* is 0.06, statistically significant at the 5% and 10% levels. Nonetheless, with regards to the *AR*

[63] Although not tabulated, direct examination of the change in liquidity is also examined (measured as the average volume within a 250-trading day window before the announcement and 250-trading day window after). The mean (median) volume turnover significantly increases following the announcement. by 0.4% (0.2%). This is in line with the argument that liquidity is increased after the offer.

Table 6.6: Weighted Least Square regressions of short and long-run AR

The table presents the coefficients of WLS analysis. Observations are weighted by the reciprocal of the residuals obtained from estimating the market model (standardised *AR*). Panels A and B examine the effects of the various variables on the short- and long-run *AR*, respectively. Announcement and issue day *AR* are 3-day window (-1, +1) *AR*, as described as Table 6.2. The long-horizon *AR*, that is *BHAR*, *FF-3-factor*, *Carhart-4factor* and *LQT-2factor* are event time retunes as measured in panels A, B C of Table 6.3. Discount is the difference between the offer price and the market price the day prior the announcement, as a percentage of the market price. $AR_{pre\text{-}offer}$ is the abnormal holding return of the previous year. Volatility is the volatility of abnormal return for the months (-36, -1) prior the event. News is a binary variable that takes one for the 'investment' sample and zero for the 'operating' one. Spread is the bid-ask spread and TrVolm is the natural logarithm of the trading volume. *OffSize* is the relative offered size and Proceeds the natural logarithm of the gross proceeds. $\Delta concentr^{*}D_{mgt\_turn}$ is an interaction term between the change in concentration before and after the events (Δconcentr) and a binary variable (D_{mgt_tunv}) that takes 1 when managerial changes are reported within the ±4 months around the announcement. *Str.inv* is a binary variable that takes 1 when strategic investor participates, and zero otherwise. FF-Δmonth.risk, Carhart-Δmonth.risk, LQT-Δmonth.risk represent the average monthly change in the required rate of return under the FF-3factor, Carhart-4factor and LQT-2factor models, respectively, as in Table 6.5. To control for multicollenearity a 10 VIF cut-off point is used. P-values are in parentheses.

Model	Dependent Variable	Intercept	Discount	Adj.disc	$AR_{pre\text{-}offer}$	Volatility	News	Spread	Tr.Volm	OffSize	Proceeds	ΔConcent* D_{mgt}	Str.Inv	Obs	Adj. R^2	F
Panel A: Short-run market reactions																
1	$CAR_{annc(-1,+1)}$	0.438	-0.470		-0.020	-0.415	0.009	-0.531	0.003	0.294	-0.023			63	0.259	3.72***
		(0.038)**	(0.004)***		(0.242)	(0.072)*	(0.792)	(0.027)**	(0.809)	(0.008)***	(0.119)					
2	$CAR_{annc(-1,+1)}$	-0.119		0.474	-0.047	0.054	0.078	-0.447	0.006		0.002	0.004	-0.064	55	0.480	4.61***
		(0.612)		(0.000)***	(0.011)***	(0.801)	(0.048)**	(0.198)	(0.609)		(0.882)	(0.062)*	(0.125)			
3	$CAR_{adj.annc(-1,+1)}$	-0.372			-0.006	0.241	0.075	0.334	-0.003		0.018	-0.003	0.003	71	0.229	2.3**
		(0.052)*			(0.689)	(0.155)	(0.013)**	(0.016)**	(0.697)		(0.134)	(0.113)	(0.931)			
4	$CAR_{adj.annc(-1,+1)}$	-0.189			-0.015	0.025	0.054	0.354	-0.001		0.009			84	0.074	2.1*
		(0.267)			(0.139)	(0.843)	(0.070)*	(0.007)***	(0.923)		(0.386)					
5	$CAR_{adj.annc(-1,+1)}$	-0.294	0.475		-0.015	0.081	0.053	0.308	-0.010	-0.201	0.018			84	0.208	12.05
		(0.078)*	(0.000)***		(0.134)	(0.506)	(0.057)*	(0.014)**	(0.218)	(0.033)**	(0.087)*					(0.000)***

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

Panel B: Long-run abnormal performance

Model	*Dependent Variable*	*Intercept*	*Discount*	*AR pre-offer*	*Volatility*	News	*Spread*	*Tr.Volm*	*OffSize*	*Proceeds*	*FF-Δmonth risk*	*Carhart-Δmonth risk*	*LQT-Δmonth risk*	*Obs*	*Adj. R^2*	*F*
6	FF-3factor$_{(ew)}$	0.003	0.006	-0.001	-0.001	0.000	-0.008	0.000	-0.001	0.000	0.005			71	0.2616	2.4**
		(0.530)	(0.035)**	(0.211)	(0.788)	(0.574)	(0.023)**	(0.911)	(0.795)	(0.597)	(0.687)					
7	FF-3factor$_{(vw)}$	-0.001	0.000	-0.001	0.002	0.000	-0.014	-0.0004	0.001	0.000	0.007			75	0.222	3.35**
		(0.719)	(0.876)	(0.033)**	(0.358)	(0.729)	(0.005)***	(0.022)**	(0.654)	(0.421)	(0.274)					
8	Carhart-4factor$_{(ew)}$	0.510	-0.135	-0.006	-0.382	-0.046	-0.468	0.001	0.067	-0.025		0.007		57	0.4845	6.85***
		(0.003)***	(0.021)**	(0.684)	(0.000)***	(0.013)**	(0.004)***	(0.942)	(0.218)	(0.025)**		(0.532)				
9	Carhart-4factor$_{(vw)}$	-0.003	0.001	0.000	0.003	0.000	-0.013	-0.0004	0.000	0.000		0.001		75	0.2902	4.36***
		(0.516)	(0.444)	(0.529)	(0.168)	(0.802)	(0.007)***	(0.021)**	(0.841)	(0.306)		(0.102)				
10	LQT-2factor$_{(ew)}$	0.002	0.005	-0.002	-0.004	0.000	-0.008	-0.0001	-0.004	0.000			-0.060	71	0.1973	2.91***
		(0.627)	(0.092)*	(0.002)***	(0.311)	(0.703)	(0.015)**	(0.763)	(0.148)	(0.484)			(0.076)*			
11	LQT-2factor$_{(vw)}$	0.001	0.000	-0.001	-0.002	0.001	-0.018	0.000	0.003	0.000			-0.061	75	0.2742	4.11***
		(0.835)	(0.979)	(0.001)***	(0.699)	(0.525)	(0.006)***	(0.805)	(0.24)	(0.822)			(0.048)**			

***, **, * indicate statistical significance at 1%, 5% and 10% level, respectively

deriving from FF-3factor and Carhar-4factor models (models 6-9), they do not report significant coefficients for the corresponding monthly risk factor changes *FF-Δmonth.risk* and *Carhart-Δmonth.risk*. This holds regardless of the portfolios being equally or value weighted. This is also consistent with the Table 6.5 findings. Therefore, the multivariate results suggest that the (liquidity) risk reduction after the placement affects negatively the reported long-run *AR*, but only the LQT-2factor model can identify this relationship. It is consistent with the liquidity hypothesis and the view that liquidity risk is reduced after the event, however the conventional pricing models fail to adjust for the risk factor changes properly.

In line with this, the bid-ask spread coefficient becomes negative in all models (vary from -0.008 to -0.468), statistically significant at the 5% and 1% levels. That is, it reverses from the announcement *AR* regressions. This supports again the liquidity hypothesis, i.e. although the (liquidity) risk is reduced after the announcement, the traditional models cannot capture the change, driving downwards the reported *AR*. When the dependent variable derives from *BHAR*, results are qualitatively similar (not shown). *BHAR* additionally imply negative relationship of the 'investment news' sub-sample similar to the findings of Table 6.3.

Finally, the coefficient of past-performance $AR_{pre\text{-}offer}$ is negative and statistically significant at the 1% level. This holds for FF-3factor value weighted *AR* and LQT-2factor equal and value weighted *AR* (models 7, 10 and 11). Although the coefficient is closed to zero (i.e. -0.001 to -0.002) and suggests low economic value, it supports the timing hypothesis. It implies the possibility that firms place shares when they overperform. On the one hand, the significant relationship between the long-run *AR* with timing variables suggests strategic timing of the offer when the stock is overvalued (see also Table 5.7). On the other hand, given the lower *CTAR* and the little evidence for the pre-event momentum adjusted-*CTAR* documented by Table 6.3 might imply that the issue is a good investment ex-ante because of the general market conditions rather than timing ability of the management. Such interpretation would be in favour of the 'pseudo-timing' hypothesis (Schultz, 2003).

The results are consistent with prior evidence that examine the pseudo-timing hypothesis with the use of simulated datasets (Dahlquist and De Jong, 2008;

Viswanathan and Wei; 2008; Ang et al., 2006). These studies argue that pseudo-timing could partly explain the post- underperformance. It is however unlikely that pseudo-timing is able to explain the post-event underperformance. The current study is consistent with these arguments, as (pseudo) timing seems significant but with low economic value. Thus, the management does not seem to have timing ability, or ex-ante knowledge about the stock being overvalued as implied by the literature (e.g. Loughran and Ritter, 1997; Hertzel et al., 2002, Chapter 5), which rejects the overreaction hypothesis.

As a conclusion, the findings are consistent with the view that at the announcement the market reacts positively because of certification and liquidity premium. Regarding the long-run *AR*, the results strongly suggest that liquidity risk is reduced after the event (as liquidity is increased). However, the traditional models used to measure long-horizon *AR* do not adjust for the liquidity risk reduction. As a result, the expected benchmark returns are higher, causing negative bias to the reported *AR*. Finally, small impact of the (pseudo) timing hypothesis is also noticeable. These conclusions confirm the findings of Tables 6.2 – 6.4.

6.7. Summary and conclusions

This chapter attempts to explain why *AR* following private placements reverse. More specifically, private placements cause positive market reactions at the announcement (Hertzel and Smith, 1993; Wruck, 1989; Barclay et al., 2007), whereas they become negative few years later (Hertzel et al., 2002; Barclay et al., 2007; Kang et al., 1999). The common overreaction interpretation suggests that investors are over-optimist at the private placement announcement but, when their expectations are not fulfilled *AR* reverse (Hertzel et al., 2002). However, do private placing investors systematically react towards the wrong direction? There is no doubt that *AR* can be achieved. However the question is whether there is persistence to the *AR* reversal. This is the main research question this chapter, challenging the common overreaction hypothesis (Hertzel et al., 2002).

The study contributes by providing a thorough investigation on why *AR* are likely to reverse. While this study is the first that directly examines the overreaction hypothesis using UK placings, several additional competing stories that have not been tested by prior pertinent studies are investigated: the pseudo-timing hypothesis (Schultz, 2003), model misspecifications due to liquidity risk changes and inability of the model to adjust for risk changes (Eckbo et al., 2000; Eckbo and Norli, 2005), other information released along the private placing announcement (Korajczyk et al., 1991; Antweiler and Frank, 2004) and speculative activities of specific informed investors that take into consideration the UK settings.

The main findings of the chapter are gathered in Table 6.7. They suggest that when the long-run *AR* are assessed following the traditional long-horizon abnormal performance approaches, the puzzle is observed. Positive announcement reactions of about 10% are documented, which turn into significantly negative long-horizon *AR,* up to -35%. The reversal is consistent with alternative event-study approaches including the *BHAR* (Lyon et al., 1999), *CTAR* (Fama, 1998), pre-event momentum adjusted *AR* in event-time (Boechme and Sorescu, 2002).

However, the level of the long-horizon *AR* is very sensitive to the event-study method employed. Although the reversal is apparent following the above conventional approaches, liquidity-adjusted *AR* are lower. This suggests that liquidity is a significant risk factor in explaining *AR*. Likewise, when liquidity-adjusted calendar-time *AR* are estimated, the results do not support the reversal at all. Additionally, when the traditional long-run *AR* are adjusted for pre-event momentum (Boechme and Sorescu, 2002) the underperformance also becomes lower. These findings are line with the model misspecification hypothesis and the view that the reported long-horizon *AR* are attributed to model deficiencies rather than the event (Mitchell and Stafford, 2000; Brav and Gombers, 1997).

In fact, when *AR* are estimated in calendar-time, they are always closer to zero in comparison with event-time *AR* (irrespective of the pricing model used; FF-3factor, Carhart-4factor, LQT-2factor). This is consistent with the 'pseudo-timing' hypothesis (Shultz, 2003) which advocates that the offer has nothing to do with the management's ability sell overvalued stock or its ability to identify ex-ante when the firm

performance peaks. However, the findings document low economic value of the pseudo-timing hypothesis, consistent with the view that it is unlikely to be able to fully explain the post-event underperformance (Dahlquist and De Jong, 2008; Viswanathan and Wei; 2008; Ang et al., 2006). At the same time, the overreaction hypothesis does not seem to hold either, as the correlations between announcement and long-run *AR* are not significantly negative.

Furthermore, the analysis documents significant reduction in liquidity risk following the event, consistent with Eckbo et al. (2000), Brav and Gombers, (1997), Eckbo and Norli (2005). This reduction justifies the lower liquidity-adjusted *AR*. Interestingly, the FF-3factor and Carhart-4factor models do not report significant changes in risk factor loadings following the offer. Only when the analysis involves the LQT-2factor model the liquidity risk factor loadings and expected cost of equity are significantly reduced ater the placing. This suggests that the traditional asset-pricing models fail to adjust for liquidity risk changes. Therefore, since liquidity is increased, expected returns should be lower. Nevertheless, if the model is unable to adjust for the risk reduction, the *AR* will be negatively biased. Indeed, WLS analysis reports significant negative relationship between the post-offer *AR* and the average reduction in liquidity risk. This suggests inability of the models to completely control for liquidity risk changes. This is also consistent with the Eckbo et al. (2000, p.128) implication that issuers are more liquid in comparison with their non-issuer benchmarks.

Regarding the remaining hypotheses, the private placements are classified based on other information released at the announcement into 'investment news' and 'operating news'. They do not indicate significant differences in their *AR* paths, which rejects the hypothesis that other information can explain the reversal. Speculation cannot explain the reversal either, as *AR* do not reverse immediately after the issue day as the corresponding hypothesis predicts.

As a conclusion, the results contradict the overreaction hypothesis and mainly suggest model misspecification problems. Considering that the traditional factor models (Fama and French, 1993 and Carhart, 1997) fail to adjust for liquidity risk changes following the event, the *AR* reverse due to the failure to control for risk factors other than the conventional size and BTM. These findings are consistent with, and extent the work

of, Eckbo et al. (2000) and Eckbo and Norli (2005). It appears that using only the size and BTM as risk factors, the analysis ignores liquidity (and transaction costs), as well as fails to adjust for subsequent factor and cost-of-equity changes subsequent to the event. Therefore, the findings highlight the significance of choosing an approach that properly adjusts (to the extent it is possible) for liquidity risk changes.

Table 6.7: Summary of main findings of chapter six

The table outlines the main findings of this chapter with regards the *AR* reversal hypotheses. The first column presents the hypothesis tested, the second column the relevant expectations and the third whether the results support the specific hypothesis. The last column adds further information.

Hypothesis	Prediction	Consistent results	Further information
H6.1α. Reversal in the UK	Positive announcement *AR* Negative long-run *AR*	√ √	*Negative AR under the traditional event study models*
H6.1b. Overreaction	Negative correlation between short and long-horizon *AR*	×	
H6.2. Pseudo-timing	Only event-time *AR* are significantly negative Cluster in specific periods	? √	*CTAR are always lower than event-time AR* *Regression analysis also suggests little evidence*
H6.3α. Liquidity/ Risk factor changes	Changes in cost-of-equity Reduction in liquidity Inability of the benchmark to adjust for the risk changes	√ √ √	*Monthly change in the required cost of equity due to reduction in liquidity risk* *Change in liquidity risk is ignored by the FF-3factor and Carhart-4factor models*
H6.3b. Model misspecification	Different *AR* approach lead to different conclusions	√	*AR are sensitive to the methodology employed.* *When AR are adjusted for pre-event momentum and liquidity risk, the reversal disappears*
H6.4. Other information	Different *AR* patterns for the 'investment' and 'operating' news sub-samples	×	*Not clear long-run AR of the two sub-samples.* *Insignificant long-run AR differences*
H6.5. Speculation	Negative *AR after* the issue day	×	*Normal issue AR for the full sample & positive for 'investment news'*

Chapter 7 : Concluding Remarks - What do we learn from this study?

7.1. Introduction

This study investigates implications of non pre-emptive equity offerings. It focuses on two types of UK equity offerings. The first type involves placements of newly issued capital which is not offered first to the existing shareholders on a pro-rata basis (primary placings). The second type involves blocks of already listed shares, initiated by existing shareholders rather than the company (secondary placings).

Various reasons to investigate these two UK equity offering types exist. First, previous studies that investigate equity offerings by UK listed companies focus mainly on the pre-emptive offers such as right and open offers (e.g. Armitage, 2000; 2002; 2007; Levis, 1995; Ngatuni et al., 2007; Iqbal et al., 2007). Contrary, the evidence on pure placings is limited, while blocks of already listed stock have not been examined at all (to the best of my knowledge). In fact, very few studies investigate UK (private) placings. Few of them define placings similar to the US firm commitment offers (Slovin et al., 2000) and others use placements accompanied by open offers or right issues (Ho, 2005; Balachandran et al., 2009). Balachandran et al. (2009) and Armitage (2010) use pure non pre-emptive placements, investigating the choice among flotation methods and the identity of the parties involved, respectively. Barnes and Walker (2006) investigate the choice between right offers and placings. The current study explores new questions.

It also adds to the body of knowledge by additionally presenting evidence on secondary placements. It focuses on the offered price, the market reactions around the announcement and the long-horizon abnormal performance surrounding the two offering types. It attempts to explain the reported patterns, to identify differences between the two placing types and, to report whether the findings are consistent with the predominant US arguments and models. Overall, the study contributes by

providing new evidence on UK non pre-emptive equity offerings (primary and secondary) for which evidence is sparse. It also reinforces the view that US arguments are not always applicable in the UK (Slovin et al., 2000; Armitage, 2002).

This chapter is structured as follows. Section 7.2 summarizes the research objectives and testable hypotheses of the study. Section 7.3 highlights the main findings and contributions to the equity offerings literature. Section 7.4 emphasises the study contributions and implications to the broader finance areas, theory and methods. Finally, section 7.5 discusses limitations of the study and opportunities for further research.

7.2. Summary of research objectives and testable hypotheses

7.2.1. Objective 1: The discount or premium explanations

The first research objective of the study *(Obj.1)* is to identify the main determinants of the discount or premium for the two UK offering types tested. It is well documented that the SEO discount constitutes one of the most substantial costs for the firms raising equity (Armitage, 2002; Hansen, 1986, Eckbo and Masulis, 2007). In addition, large heterogeneity between the investor valuations in the UK is observed (Armitage, 2010). This evidence raises the need to understand the relevant implications of UK placings better. Moreover, evidence on the pricing techniques of UK secondary placings sparse, which provides an additional motivation to investigate this issue.

To meet this objective, four hypotheses are tested. First, the offered discount reflects certification costs due to asymmetric information between the firm and the market (Hertzel and Smith, 1993; Altinkilic and Hansen, 2003; see section 4.3.1). Second, the discount reflects monitoring expenses occurred by investors aiming to act as external monitor factors and improve firm performance (Wruck, 1989; Wruck and Wu, 2009; see section 4.3.2). Third, the discount reflects liquidity costs/risks. Evidence on liquidity and inelastic demand involves mainly other types of SEO (Corwin, 2003; Altinkilic and Hansen, 2003; Loderer et al., 1991; Silber, 1991; Maynes and Pandes, 2008; see section 4.3.3) and has not been examined by prior studies as an explanation for the discount of the two types of non pre-emptive offers.

Finally, the fourth hypothesis focuses on the offered premium. The premium reflects agency problems. Investors do not have incentives to pay more than the market price, unless they pursue private benefits (Barclay and Holderness, 1989; see section 4.3.4).

7.2.2. Objective 2: Good timing and/or earnings management

The second objective of the study *(Obj.2)* is to assess the stock and operating long-run abnormal performance for the years surrounding the non pre-emptive equity offerings and, explain the relevant implications (for which evidence is in elementary stage). Prior evidence suggests that placing firms overperform their benchmarks the years before, but underperform the following years (e.g. Hertzel et al., 2002; Barclay et al., 2007; Loughran and Ritter, 1997). This pattern implies growth in market prices prior the offer that subsequently deteriorates. The literature suggests that the management/the sellers identify a window of opportunity to sell temporary overvalued equity (e.g. Hertzel et al., 2002; Loughran and Ritter, 1997; Clarke et al., 2001; 2004; Lee, 1997). The premise of this hypothesis is that, the sellers have the ability to predict the subsequent value deterioration in market prices and, time the offer when the firm performance peaks.

This timing hypothesis is examined for the secondary placings. Regarding the primary offers, the study contributes by arguing for a different version of 'timing'. Since the primary investors in the UK are mainly existing shareholders (Armitage, 2010), then knowingly buying overvalued stock is obscure. If the stock performance indeed peaks at the offer and deteriorates afterwards, it would imply real over-optimism about the stock future value (see section 5.3.1). The study additionally investigates whether accounting measures facilitate the signal of accounting growth and expectations for value improvements (Rajan and Servaes, 1997). The second hypothesis is that, the firm deliberately manipulates the earnings the year before the offer (e.g. Teoh et al., 1998b; Rangan, 1998; Yoon and Miller, 2002; Iqbal et al., 2009). The two hypotheses are not mutually exclusive and imply that investors are not able to understand the real implications behind the offer (see section 5.3.2).

7.2.3. Objective 3: Long-run abnormal performance methods

The third objective of the study *(Obj.3)* is to review the debate on long-horizon abnormal performance research design and, assess whether including (il)liquidity as a risk factor facilitates in assessing expected returns.

Going through the literature, it becomes apparent that none model can be adequate for robust inferences (see section 3.8). The important issues to consider are based upon i) the ability of the asset-pricing model to asses expected performance; ii) the method of estimation of the long-run *AR* (event or calendar-time); iii) statistical tests to overcome econometric problems that each approach is subject to and; iv) the nature of the sample and research question. In general, the asset-pricing literature has failed to provide a single risk-adjusted model, with no biases against which one can measure post-event stock performance (see Chapter 3).

Hence, the need to understand the several practical issues is fundamental. The study attempts to provide guidance on the choices among the several alternative methodologies. It also empirically tests an alternative liquidity-adjusted pricing model in order examine whether higher predictive ability can be achieved.

7.2.4. Objective 4: Explanation of the reversal in abnormal returns

The final research objective of the study *(Obj.4)* is to provide an explanation for the puzzling reversal of *AR* associated with private placings. That is, the pattern of positive market reaction at the announcement (Hertzel and Smith, 1993; Wruck, 1989; Barclay et al., 2007; Kang and Stulz, 1996; Kato and Schallheim, 1993; Wu et al., 2005) which is followed by negative post-offer long-run abnormal performance (Hertzel et al., 2002; Barclay et al., 2007; Sheehan and Swisher, 1998; Kang et al., 1999). This pattern implies systematic mispricing of the placing stock. It suggests that investors do not learn from the past and systematically react towards the wrong direction. This casts doubts on market efficiency.

To meet this objective, five hypotheses are tested. First, the puzzling *AR* reversal is valid in the UK. As this puzzle has not been tested for the UK market before (to the best of my knowledge) an out-of-sample examination of the reversal and the

overreaction hypothesis is necessary to examine the 'persistence' of this 'anomaly' (see section 6.3.1). Second hypothesis is that the firms do not have timing ability as prior evidence suggest (section 5.3.1), but they simply sell equity when the prices are high. This pseudo-timing hypothesis predicts that event-time *AR* are likely to report negative *AR* even when none exists and the pre-event expected returns are zero (see section 6.3.2). The third hypothesis tests whether the liquidity risk is reduced after the offer, however the traditional benchmark models used to measure post-offer long-run *AR* do not properly adjust for the risk reduction (see section 6.3.3). Fourth, other events released along the placing announcement drive the reported *AR*. Distinguishing the firms according to other information might eliminate the reversal (see section 6.3.4). Finally, according to the fifth hypothesis investors might have incentives to temporary manipulate the market price upwards, in order to sell at higher price (see section 6.3.5).

7.3. Main findings and contributions to the equity offerings literature

7.3.1. Private placements

7.3.1.1. Discount determinants

Regarding the first objective *(Obj.1)*, large discrepancies between placements priced at premium and discount are observed. The difference between primary placings priced at premium and discount is about 25%-30%. This confirms the large heterogeneity of the valuations in the UK (Armitage, 2010). In addition, the US evidence about new investors that incur expenses to monitor the incumbents and increase firm value (Wruck, 1989; Wruck and Wu, 2009) has only a small weight in the UK. Not only normal activity signs are observed (see sections 4.6.1.2 and 4.6.1.3), but also OLS cross-sectional analysis implies a very small real relation between ownership and managerial changes with the offered discount (see Table 4.5). Thus, the study cannot support the view that external monitoring will help in increasing firm value in the UK (contrary to the suggestion of Slovin et al., 2000).

While someone could argue that the small weight of monitoring is consistent with entrenchment (Barclay et al., 2007), the study advocates that it is not about

entrenchment or other related agency issues either. Instead, OLS analysis suggests that private placing investors require discount as compensation for liquidity costs or risks, while pure asymmetric information is also significant (see Table 4.5). Hence, the discount reflects information and liquidity costs (Corwin, 2003; Altinkilic and Hansen, 2003).

Although the discount has been previously linked with the liquidity risks of other SEO types such as public, rights and open offers (Barclay and Litzenberger, 1988; Kothare, 1997; Corwin, 2003; Altinkilic and Hansen, 2003; Armitage, 2007; 2002) and with sale-restricted private placings (Silber, 1991; Maynes and Pandes, 2008) across countries (e.g. US, Canada, UK; see section 1.3.1.2), this is the first study that reports similar findings for pure non pre-emptive placings. This study contributes by arguing that liquidity is possibly a common driving factor within SEO types and markets. Liquidity costs seem significant regardless of other related factors e.g. monitoring, manipulative short-selling and/or institutional settings. This conclusion derives from the finding of prior SEO studies, restricted placings and chapter 4.

7.3.1.2. Good timing and/or earnings management

With regard to the second objective *(Obj.2)*, primary placing firms indicate stock overperformance prior the offer which deteriorates afterwards (see section 5.6.1.1). This pattern complies with prior international evidence (see section 5.2). Contrary, the operating performance the year prior the UK placing is mainly normal (see section 5.6.2.1). These findings are robust to alternative sensitivity tests (see section **Error! Reference source not found.**) and suggest that prior the offer the market prices are temporary over-priced (consistent with prior international evidence). This study additionally contributes by documenting the paths of other accounting ratios (beyond earnings) that might help the temporary miss-valuation. Consistently, the primary placing firms indicate high sales and debt growth prior the offer. Both items deteriorate afterwards similar to the stock abnormal performance (see section 5.6.2.1), while OLS analysis indicates that such growth measures can explain the post-offer *AR* (see section 5.6.5.1). This suggests that investors observe the higher

debt and sales growth prior the offer and are over-optimistic about the stock future performance.

In addition, the study contributes by providing new evidence that placing firms do not use current accruals to manage earnings (see section 5.6.3.1). Contrary, long-term accruals are significantly positive the years around the event. Recall that long-term accruals are non-cash expenses associated with the firm fixed assets (e.g. depreciation and amortization). Therefore, the reduced depreciation component complies with the view that private placing firms face under-investment problems (Hertzel and Smith, 1993). The study documents significantly negative relationship between discretionary long-term accruals and post-offer *AR*, suggesting that underinvestment eventually reduces firm value (see section 5.6.5.1).

Hereby, the findings suggest that the placing stock was overvalued at the announcement. However, investors do not seem to realize this miss-valuation or conceive the stock and accounting growth as temporary. They seem to have high anticipations on the future firm value (Hertzel et al., 2002).

7.3.1.3. The puzzling reversal of abnormal returns

With regard to the third and fourth research objectives *(Obj.3* and *Obj.4),* this study suggests that similar to prior international evidence, in the UK the *AR* are significantly positive at the announcement and turn negative few years later (see sections 6.4.1 and 6.4.2 respectively). However, this pattern is valid *only* when long-horizon *AR* are estimated following the traditional long-run *AR* methods such as buy-and-hold *AR* (e.g. Barber and Lyon, 1997; Lyon et al., 1999) and calendar-time *AR* (e.g. Fama, 1998; Mitchell and Stafford, 2000). In fact, sensitivity to long-horizon *AR* methods is reported (see section 6.6.1.4).

The current study additionally contributes by directly addressing the possibility of liquidity risk reduction following the equity offering (as implied by Eckbo et al., 2000; Brav and Gombers, 1997; Eckbo and Norli, 2005). With the application of a two-factor model that captures the illiquidity premium (Liu, 2006), the study documents reduction in the liquidity risk factor loadings following the event (see

section 6.6.2.2). The *AR* reversal disappears when the benchmark model controls for liquidity risk changes (see Table 6.3). In addition, WLS analysis reports significant relationship between the post-offer *AR* and the average reduction in liquidity risk (see section 6.6.3.2). This holds only when *AR* are adjusted for liquidity. The traditional Fama and French (1995) and Carhart (1997) models do not document such relation with cost-of-equity changes, while they are unable to capture the liquidity risk reduction. These suggest inability of the models to completely control for liquidity risk changes. These findings contribute to the extant literature that report reversal in *AR (Obj.4)* and also to the on-going debate on long-horizon *AR* methods *(Obj.3)*.

In addition, when the long-run *AR* are estimated in calendar-time, they are always lower in comparison with the event-time *AR* (regardless of the model; see Table 6.3). This supports the pseudo-timing hypothesis (Schultz, 2003) which can only partly explain the post-underperformance (Dahlquist and De Jong, 2008; Viswanathan and Wei; 2008; Ang et al., 2006) and has not been considered by prior private placing studies as an explanation of the reversal. However, its economic value is small (see section 6.6.3). Likewise, the study contributes by re-examining the timing and overreaction hypotheses as explanation of the *AR* reversal. In fact, it rejects the common overreaction hypothesis (Hertzel et al., 2002), as the correlation between the announcement and long-run *AR* is not significantly negative (see section 6.6.2.1).

Finally, when the calendar-time *AR* are adjusted for pre-event momentum, any reported underperformance is of very small economic value (-1.2% over the three-year period). It could thus be argued that the reversal is again eliminated. Overall, the reversal is driven by pre-event momentum, liquidity and inability of the conventional models to adjust for reduction in liquidity risk following the event.

7.3.2. Blocks of already listed shares

Having examined the primary placings that few results are consistent with prior studies, the results about the secondary placings differ substantially from those of the prior literature, regarding countries other than the UK.

7.3.2.1. Discount or premium

To start with the first research objective *(Obj.1)*, the study reports large heterogeneity in the valuations of the secondary placings (see section 4.6.1.1) similar to primary placings. However, the difference between premium and discount within the secondary offers is about 13%-15%, i.e. about half of the corresponding reported levels of the primary placing discrepancy. In fact, the secondary placements are priced at approximately 7% lower discount in comparison with the primary offers (see Table 4.2). Given that secondary offerings involve already listed stock that the market has assessed its value, lower asymmetric information is plausible (Lee, 1997).

Nonetheless, OLS analysis highlights that uncertainty and asymmetric information are the main discount determinants (see section 4.6.2.2). It appears that investors are uncertain about the stock value and require discount as compensation for the risk they face to invest to the particular stock. Therefore, the UK secondary placements are not priced mainly at premium as some prior US evidence suggests (Barclay et al., 2001; 2007; Barclay and Holderness, 1989).

Moreover, contrary to existing evidence that new investors join the firm to enhance firm value (Bethel et al., 1998; Allen and Philips, 2000; Barclay and Holderness, 1991) and might be willing to pay more, investors participating into UK secondary placements are mainly existing shareholders. In addition, there are no significant monitoring activities (see section 4.6.1.2). While small monitoring expenses are implied by the multivariate analyses, their economic value is small (see Table 4.5).

Finally, prior evidence suggests that secondary offers are priced at premium due to extraction of private benefits (Barclay and Holderness, 1989). This study provides supportive evidence that premium indeed reflects private benefits. However this is irrespective of the offer type being primary or secondary (see section 4.6.3). The placing type is not important when investors have self-dealing incentives (Wu and Wang, 2005).

7.3.2.2. Good timing and/or earnings management for the secondary placings

Regarding the second research objective *(Obj.2)*, the study contributes by providing strong evidence of timing associated with secondary placings. More specifically, the stock performance peaks at the offer year but deteriorates afterwards (see section 5.6.1.2). Contrary, the accounting performance seems normal during all years around the offer (see section 5.6.2.2). These findings suggest that the stock is over-priced during the offering, consistent with the timing hypothesis; the sellers identify a window of opportunity to sell overvalued stock.

These findings oppose the common perception that secondary placings are related to post-offer overperformance due to activities of the new investors (Bethel et al., 1998; Barclay and Holderness, 1991; Allen and Phillips, 2000). It also suggests that investors are not active and are not interested in improving the future firm value (in line with the *Obj.1* findings; see section 7.3.2.1). It is thus inconsistent with the US view that secondary placings constitute 'corporate control transactions' (Barclay and Holderness, 1991; Allen and Phillips, 2000), or that investors participating into secondary placings are 'activist' (Bethel et al., 1998).

In addition, the study provides evidence that secondary offering firms have significantly lower sales in comparison with performance matched firms (see Table 5.3). Consistently, discretionary current accruals are significantly negative the year prior the offer, which suggest conservative accounting policies (see section 5.6.3.2). Conservative accounting might target tax avoidance or reduced dividend distributions. At the same time, discretionary and non-discretionary long-term accruals are significantly negative, which suggest increased depreciation component. As discretionary long-term accruals are also negatively related with the post-offer *AR*, over-investment problems are implied.

To the degree I am aware of, this is the first study that tests and provides evidence that UK secondary offerings precede earnings management, or evidence for timing. OLS analysis confirms the above findings (see section 5.6.5.2). Overall, the study contributes by indicating that the sellers take advantage of information they possess and sell over-valued stock.

7.4. Further implications and contributions

7.4.1. Contributions to theory and implications to broader finance areas

7.4.1.1. Contributions to signalling theory

As a SEO conveys asymmetric information between the firm and market, according to the signalling theory (see section 1.3.2.1), the negative reactions following various types of SEO announcements (see section 2.3.4) are attributed to adverse selection problems (Myers and Majluf, 1984). Firms sell overvalued securities (Akerlof, 1974) and the market receives 'bad' signals about the firm value, i.e. 'the firm is a lemon'. However, the positive market reactions to the announcement of UK placings (see section 6.6.1.1) suggest that the placing firms are *not* 'lemons'. This is in line with prior international evidence on private placings (see section 2.3.4).

Contrary, with regards to the secondary placings or placings priced at premium, it seems that investors do not receive any significant signal or they are not confident on how to interpret the event (reactions are not statistically significant. See sections 5.6.1.2 and 4.6.3, respectively). Hence, it is less clear whether a 'market for lemon' with regard to these two UK placing types exists. This suggests different investor perceptions about the implications around the UK placings.

7.4.1.2. Contributions to agency theory

The study contributes to the agency theory in three ways. First, the study complies with recent evidence (Armitage, 2010) that investors in UK SEO are not new as implied by the prior studies (e.g. Hertzel and Smith, 1993; Wruck, 1989; Krishnamurthy et al., 2005; Barclay et al., 2007; Slovin et al., 2000). Therefore, conflict of interests between the principals and the owners is limited. Consistently, the study reports that investors in UK non pre-emptive offers do not appear eager to get more active role with the management or to improve firm value in any of the two offering types (see section 4.6.1.2). This contradicts US findings that investors have significant monitoring activities and cause value enhancements in private placings (e.g. Wruck, 1989; Wruck and Wu, 2009; Krishnamurthy et al., 2005) or secondary offerings (Bethel et al., 1998; Barclay and Holderness, 1991).

However, different agency costs are associated with primary placing firms. The findings imply underinvestment problems which reduce firm value, consistent with Hertzel and Smith, 1993 (see sections 5.6.3.1 and 5.6.5.1). Likewise, the study reports significant downwards earnings management prior the secondary placings, and overinvestment problems (see section 5.6.3.2). The firms indicate high depreciation components and discretionary long-term accruals which reduce the firm value. This suggests investments into negative NPV projects that do not add shareholder value. Therefore, conflicts of interest are apparent.

7.4.1.3. Contributions to market efficiency

Fama (1998) suggests that an observed pattern or 'anomaly' that rejects market efficiency should be re-examined at different time periods in order to capture whether it is real. Maybe investors have learned about its existence and explore it to the extent that it is no longer observable (Fama, 1991; Malkiel, 2003; Schwert, 2003). Alternatively, new methodologies that control for several problems and adjust for various risk factors facilitate to explain the anomaly. Recall that the market efficiency is jointly tested with a model of equilibrium which is assumed to be able to predict expected returns (given that the market is efficient; Fama, 1991).

Motivated by the reversal of private placing *AR* that casts strong doubts on market efficiency, this study contributes by examining this pattern in a market that has not been examined before (UK) and, by using a more recent dataset (1998-2005). It additionally uses an alternative model that is likely to capture the variation of expected returns better. These factors might assist in explaining the pattern.

The study advocates that the puzzling reversal of private placing *AR* that rejects market efficiency is valid only if long-run *AR* are measured under the conventional event-study approaches. Hence, traditional models are unable to adjust for risk changes and possibly for pre-event momentum (see section 6.6.2.2) which lead to the reported reversal in *AR*. In other words, the reversal is not driven by the inability of investors to understand the placing implications or because they systematically miss-value the stock. Contrary, the pattern is mainly driven by the model of equilibrium used to measure misspricing. Therefore, the study contributes to the extant literature

by rejecting the behaviour finance interpretations that the market is not efficient and investors systematically react towards the wrong direction when a private placing is announcement.

7.4.2. Contribution to methods

A significant motivation to investigate new methodologies is the argument that new long-run *AR* methods that control for known or potential biases, help in providing 'normal' inferences over a specific sample (Schwert, 2003). With regard to the IPO literature, Eckbo and Norli (2005) imply that the traditional long-horizon *AR* models fail to control for reduction in stock liquidity following the offer. Similarly, Eckbo et al. (2000) suggest reduction in leverage following an SEO. This study directly addresses these concerns by deviating from the conventional long-run event-study approaches and applying a liquidity-adjusted asset-pricing model (Liu, 2006) as an event-study tool.

The study contributes by advocating that illiquidity is indeed significant factor for long-horizon *AR* and models beyond the conventional ones can explain the *AR* (see section 6.6.1.4). The findings support the view that *AR* around several corporate events is likely to be manifestation of model deficiencies (Brav and Gompers, 1997; Lyon et al., 1999; Ritter and Welch, 2000; Gompers and Lerner, 2003). The study strongly underlines the need to improve the long-horizon *AR* methods to adjust for liquidity risk or other risk that causes change in the factor loadings.

In addition, the study contributes by suggesting caution in the concept of 'risk factors'. Liquidity risk should be considered as a component of the cost of equity. Failure of the model to adjust for any change in the risk factor loadings will cause bias in the reported abnormal performance. As a conclusion, direct examination of the risk changes and relevant controls are maybe necessary. These findings might be of interest not only to the area of corporate finance, but also in behaviour finance, asset-pricing literature and, market based accounting research.

7.5. Limitations and further research

7.5.1. Problems and limitations

Given the equity offering settings in the UK (see section 2.2), the placings could be characterized as a 'black box'. The accessible information is limited as the disclosure requirements do not 'force' the placing firms to disclose it. Contrary, information is probably gathered by practitioners such as fund managers and institutional investors.

As a result, it was not able to collect accurately specific information related to the identity of the placing investors and the parties involved (see sections 4.6.1.2 and 4.6.1.3). Therefore, the number of observations in the pertinent tests was limited. In addition, the issue day and specific ownership characteristics were less clear for many firms. Hence, the tests subject to this information could use only the stocks for which the relevant information was found. Unavoidably, observations are dropped. In other words, although the UK market is small in comparison with the US, the opacity makes it more difficult to gather larger samples.

A further limitation is related to the treatment of various biases of long-run event studies (see section 5.4.1.3). The study sets several criteria to identify the appropriate benchmarks of the event-firm returns that might raise questions whether noise or biases affect the estimations. As an example, Chapter 5 treats the delisted returns by replacing them with the returns of a corresponding reference portfolio (based on size and BTM, or industry). However, Chapter 6 removes the delisted returns the month following the delisting month as an additional control and robustness test. Although this latter practice also is followed by prior studies (e.g. Kothari and Warner, 1997; Ritter, 1991) and might avoid problems of having *AR* biased towards zero, it reduces the number of observations. The same problem arises when controls for overlapping returns are taken. Nonetheless, despite the relatively small number of observations, the use of various alternative methods and competing procedures of long-run event studies suggest that the documented results are robust. It is however interesting how many firms 'disappear' during the three years tested following the placing.

7.5.2. Further research

As this is the first study that investigates UK secondary placements (to the degree I am aware of), the findings provide new knowledge about this particular equity offering type. Hence, this study 'opens' the road for further research. In other worlds, although this piece of work has reached to an end, it could still be seen as 'work on progress'. A few of the questions initially set are clearly answered, while others created further questions that would be interesting to explore. Few thoughts for further research are as follows.

7.5.2.1. Primary placings and market microstructure

Placings without pre-emptive rights become more and more common in the UK. Thus, existing shareholders might be diluted. However, the automatic imposition of pre-emptive rights in the UK raises the question whether existing investors have other means of protecting their stakes. Having a careful look at the placing prospectuses, it is common to include special EGM resolutions with which security options are allotted to few existing shareholders (usually directors and their immediate families or employees (when ESOP exists)). The options give the right to the holders to buy shares at a fix price at specific future time periods. This might help insiders maintaining their percentages from dilution. Moreover, the option holders might have incentives to manipulate the price upwards so that they can exercise the call options they are entitled to at a specific time in future, yielding higher profits. Although such possibility is in line with the speculation hypothesis (see section 6.3.5) it is not captured by the analysis.

In addition, while the analysis provided by this study about speculative activities and market microstructure is limited, deeper investigation may bring into light further implications such as lock-up agreements between the parties involved. The prospectuses of the UK placings do not include such information about selling restrictions of the new stock. However, it is not clear whether such agreements are 'informally' agreed with the underwriter before the issue. Such event would have significant impact on the stock *AR* at the time when the lock-up expires, as selling pressure will be observed. Unfortunately, UK private placements fall into a 'gray

area' which makes it difficult to have access to such information. Perhaps asking fund managers and/or institutional investors that fundamentally participate into private placements would facilitate in investigating this possibility. To my knowledge, evidence on lock-up agreements in the UK is scarce.

7.5.2.2. Research related to the broader SEO literature

Although the main objective of this study is to contribute by providing new evidence about UK non pre-emptive placings (excluding offers accompanied with pre-emptive offers such as right issues, open offers or other SEO types), further research could contribute to the broader SEO literature.

As an example, considering the existing evidence that UK open offers manage earnings the year prior the offer (Iqbal et al., 2009), it might worth examining the earnings management for UK right issues as well (to the best of my knowledge such evidence has not been reported). Comparing the level of earnings management with the market reactions at the announcement of right issues, open offers and placings might assist in understanding better the choice among the three equity offering types in relation to earnings quality. Such tests might contribute to the evidence about the demise of rights as the right offer firms are of 'lower quality' (see section 2.3.2).

Furthermore, based on the findings related to the discounted offered price, Chapter 4 argues that liquidity is one of the major discount determinants. Nonetheless, this is something that could be valid for further SEO types especially in the UK that large deviations from the market price (in both directions) take place. Such tests are however left for further research.

In addition, Rangan (1998) argues that manipulation is not revealed immediately after the SEO but within the second quarter after the event. A possibility for this delay is that, investors should maintain the stock for three to six months after the placing as there are selling restrictions. Hence, incentives to hide the earnings manipulation might be plausible. Such possibility has not been examined either.

7.5.2.3. Long-run AR, model misspecification methodologies and asset pricing

The findings of Chapter 6 provide methodological contributions. They suggest that *AR* should be measured after taking into account the illiquidity premium and changes in risk factor loadings following the event. It is important to emphasize, that this finding is not restricted to the SEO area. It is probably applicable to the broader finance literature, i.e. to the measurement of long-run abnormal performance following other corporate events and in other markets. Further research investigating this issue would make the suggestions of this study more robust.

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Appendix I –Identifying the investors in non pre-emptive offerings

It is worthwhile to understand better the various implications related to the UK non pre-emptive equity offerings. Beyond the differences in the institutional settings, preferences in issue methods and market reactions mentioned in Chapter 2, the UK market also differs as the identity of investors participating into placings are not new as the US evidence suggests (Armitage, 2010). This appendix describes efforts made to identify the parties involved into the UK, for the equity offer types used by this study.

Specifically, at the beginning of this study, no UK evidence existed regarding the identity of SEO investors in the UK. Now, Armitage (2010) examines this issue. Thus, to understand whether relevant arguments and research hypotheses suggested for the US market would be valid for the UK, this study attempted to identify the players of the two UK samples. Such description also helps in understanding better the UK market.

To identify the placing investors, a search through Nominus Database was conducted. Nominus is offered by Argus Vickers and provides ownership information for UK firms, mainly from 2000 and onwards. It typically presents the ownership data in three-month gaps, regardless of the dates of new equity issuances. Shareholdings are provided under three headers: 'fund manager', 'beneficial owner' and 'registered owner'. The beneficial owner for each placing firm is examined by this study, similar to Wruck (1989). Nominus provides the names of the shareholders without classifying into categories such as institutional, affiliates, or other. It was thus difficult to distinguish. Nonetheless, the Google search machine proved to be a helpful tool. Investors are categorized into institutional investors, individuals or corporations as follows.

Institutional investors are those belonging to the general financial sectors (UK fund managers or foreigners). It is relatively easy to detect as they their names are accompanied by words such as 'market maker', 'trusts', 'pension scheme', 'inv'. If however the owner is an industrial firm, the name is usually related to a website which indicates the nature of the company, as not being 'institutional'. In cases that

the Goggle search was unsuccessful, it was assumed that no official website is designed by the specific shareholder. Thus, he/she is classified as an individual/ single investor. Individuals include beneficial investors such as managers, directors, family members or other single investor.

Individual investors are often indicated by Nominus, as their names are accompanied by characteristics such as Mr, Mrs, Dr, Lord, Sir, Esq. Very often, the individuals involved to the placings are not new investors. They are existing shareholders that increase their stakes. Employee schemes of the placing firm (such as ESOP or EBT) were also categorized as individuals, as the corporation employees (which are represented by their own trusts) have incentives similar to individuals and higher benefits to maintain their stakes. When employee schemes of other firms (than that of the placing company) participate to the placing, they are allocated as institutions. Additionally, based on the Argus staff, some holdings of individuals were not shown separately but were grouped together under headings such as 'private clients' or 'undisclosed' accounts of financial firms' clients. It is therefore plausible to merge these categories with 'individuals'.

As a whole, the majority of the shares are bought by existing rather than new investors, contradicting the dominate US findings that investors in non pre-emptive equity offerings are new single (and/or corporate) investors. This is also consistent with the findings of Armitage (2010) who investigates not only placings but also RI and OO by UK listed firms. Additionally, existing investors are mainly institutional and individual (single) owners. When a corporate or large individual placement takes place it is usually accompanied with institutional placing.

Appendix II – Variable definitions and empirical predictions

The table defines control variables used in Chapters 4 and 6. It explains the empirical relations and predications. The proxies are distinguished based on the hypothesis they test, however some overlapping cannot be avoided; few variables can be used for more than one hypotheses but, have different expectations.

Variable	Definition and predictions
	A. Information asymmetries and mss-pricing
Discount	The offered discount as percentage of the prevailing market price. The discount is defined as the difference between the market and actual placing price, scaled by the market price that constitutes the "accessible" price for any investor: $\frac{(mkt.price_t - pl.price)}{mkt.price_t}$, where *pl.price* is the placing price collected from the news reports or prospectuses. *mkt.price* is the market price at the day preceding the announcement. Unless stated otherwise, the market price is the unadjusted share prices (DS item UP). (i) According to the certification hypothesis (Hertzel and Smith, 1993), the discount level should reflect costs inquired by the private investors to assess firm value. If it signals certification to the market (that the stock is undervalued), the discount will be positively related to announcement *AR* and nil to long-run *AR* (the market should adjust). If there is permanent change in the stock fundamental values it should be positively related to the long-run *AR*. Contrary, negative relation to the long-run *AR* would imply miss-pricing. (ii) Alternatively, the discount represents investor compensation for the price pressure in the market price following the announcement due to the stock inelastic demand (Barclay and Litzenberger, 1988; Corwin, 2003; Altinkilic and Hansen, 2003). In such case, it should be positively related to the relative offered size (and the announcement *AR* unadjusted for the information and price pressure impact).
Adj.Disc.	When new shares are issued at a price different than the market one, the market price is expected to change due to the different value of the new shares. Assuming no information effects, offering additional stock at a price different than the market one, the subsequent market price is expected to be equal the weighted average value between the two prices; the market price will experience a mechanical dilution. Hence, the adjusted discount equals the difference between the adjusted market price minus the offered placing price: $\frac{(adjP_{t+1} - pl.price)}{adjP_{t+1}}$, where $adjP_{t+1}$ is adjusted for this mechanical effect: $adjP_{t+1} = \frac{N.Old_{shares} * mkt.price_{t-1} + N.New_{shares} * pl.price}{N.Old_{shares} + N.New_{shares}}$, where $N.Old_{shares}$ is the number of the existing shares, $mkt.price_{t-1}$ the market price the day prior the announcement, $N.New_{shares}$ the number of the new placing shares and $pl.price$ the placing price.
Age	The years since the corporation listing. A positive relationship to the discount suggests information costs.
F.Value	The natural logarithm of the firm market value (enlarged for the private placing sample). (i) Similar to the age, a positive relationship to the discount suggests information costs. (ii) A positive relationship to *AR* suggests the reduction in asymmetric information due to the event suggests undervaluation consistent with the certification hypothesis (Hertzel and Smith, 1993).
$AR_{pre-offer}$	The firm performance prior the private placing. Unless stated differently, $AR_{pre-offer}$ is

	the *BHAR* based on a control firm with similar size and industry for the 12-month period prior the offer (-12, -1); one month prior the event is not included to eliminate the effect of any leakage about the event. The variable should indicate firm's long-term ability to produce *AR*. It is hence a proxy to capture the "impression" the market has on the specific stock, which will affect the market announcement reactions accordingly. Assuming the market is efficient, no significant relation to the long-run *AR* is expected. A negative relation with the post- long-run *AR* will be consistent with the overreaction and timing hypotheses (the offer is timed when the firm overperforms, while the market fails to realize the implication ex-ante).
Volatility	The average volatility of past performance. Following Altinkilic and Hansen (2003) it is defined as the standard deviation of the *AR* prior the event. Volatility is defined as the variance of the stock holding-period *AR* for the prior the three years prior the event ($\text{var}_{AR_{(-36,-1)}}$): $Volatility = \sqrt{\text{var}_{AR_{(-36,-1)}}}$. $AR_{(-36,-1)}$ is the stock *BHAR* for the months (-36,-1), based on a control firm with similar size and book-to-market. Volatility captures the value uncertainly of the stock, it riskiness. Thus, the proxy reflects the perception of the firm about its risk/expected performance, or, the "investor heterogeneity". Stocks with higher investor heterogeneity are expected to report lower *AR* as lower volatility denotes less risk (Loderer et al. 1991; Ritter, 1988). Significant relationship with the announcement or issue day *AR* would imply change in the stock risk/uncertainty and thus, change on the expected rate of return.
Concentr.	The ownership concentration. In a manner similar to prior studies (Wruck, 1989; Hertzel and Smith, 1993; Kothare, 1997) this study aggregates the portions (as a percentage of the total capital) of the six largest beneficial holders before the placing. According to the original monitoring hypothesis (Wruck, 1989) positive relationship to *AR* imply monitor intentions; the discount reflects monitoring costs and the market expects value improvements.
News	A 'news' variable. It is a binary variable that takes 1 when the stock belongs to the 'investment news' sub-sample, where an acquisition or other investments plan is announced along the private placing. It takes zero when the firm belongs to the 'operating news' sub-sample, announcing news about liquidity needs, reconstruction and/or reorganization along the private placing. The dummy should capture the difference in market reactions between the two sub-samples.

B. Monitoring and post-purchase activity

Δconcentr	The change in ownership concentration. According to the monitoring hypothesis (Wruck, 1989) a positive relationship to the discount and announcement *AR* suggests investors are intent to be active and help in improving firm value.
Δconcentr * D_{mgt_turn}	An interaction term that indicates post-purchase activities of the placing investors. D_{mgt_turn} indicates changes in top management for the ±4 months around the event (1 for changes and zero otherwise). It captures pre-placement agreements between the firm and the placing investors, suggesting the intention of investors to become active, in terms of gain a place among the managers and affect firm policies. This proxy addresses the concerns that change in ownership concentration does not necessarily suggests monitoring, rather investors might entrench the incumbents (Barclay et al., 2007). (i)Positive relationship to the offered discount and *AR* imply monitoring and activity intention and (ii) negative relationship suggests private benefits.

Str.Inv	Strategic investor. This is a binary variable that takes 1 when the investor is classified as strategic and zero otherwise. Strategic investor is the one who buys the whole or substantial portion of the placing (20%) but it is not an institutional investor. It could be large existing shareholder, insider, director or other affiliated investor. It is also the one who subscribes for such percentage of the placing necessary to maintain his/her stake undiluted or, such percentage with result to be characterized by the LSE authorities as 'related party'. Even if the placing is relatively small but significant for the investor wealth as it can provide him/her with bargaining power, to affect firm policies. (i) Negative relationship to the discount and *AR* would imply monitoring costs, (ii) while positive would imply private benefits.

C. Liquidity

Tr.Volm	The trading volume prior the event. Following Corwin (2003), it is defined as the natural logarithm of the mean volume (DS item VO) within a window of 250 trading days prior the announcement (-250,-1): $Tr.Vom=\ln(VO_{j,t})$. (i) The trading volume is a measure for existing information asymmetries, as well as for the quantity dimension of liquidity (e.g. Wu, 2004; Corwin, 2003). Positive relationship to the *AR* suggests reduction in asymmetric information and enhancement in firm liquidity which increases stock prices. (ii) Second, negative relation to the discount would imply liquidity costs. (iii) Finally, more liquid stocks face flatter demand curves and are positively related to the stock elasticity of demand. Significant negative relation to demand elasticity would contradict the notion of perfect elasticity (Loderer et al., 1991) with reference to Lippman and McCall, 1986).
Spread	The bid-ask spread of the stock. Following Kothare (1997) bid-ask spread is defined as the average spread within a window of 30 days prior the event. Spread is the difference in ask and bid prices divided by their midpoint price: $Spread=\frac{Ask\text{Price}_j - Bid\text{Price}_j}{(ask\text{Price}_t + bid\text{Price}_t)/2}$. The spread is widely used by the academic literature to capture the transaction cost dimension of stock liquidity as well as proxy for the existing level of asymmetric information (Glosten and Harris, 1988; Corwin, 2003; Altinkilic and Hansen, 2003; Wu, 2004; Leuz and Verrecchia, 2000; and others). Higher spread suggests less liquidity and higher asymmetric information.

D. Inelastic demand

OffSize	The new shares placed as a percentage of the shares outstanding: the relative offered size. It represents the increase in shares available to the market, thus the increase in stock supply. Following Corwin (2003), *OffSize* is defined as $OffSize = ShPlaced/Sh.Outst$, where *Sh.Placed* is the number of shares placed as stated in the news report/prospectus. *Sh.Outst* is the enlarged number of ordinary shares outstanding (including the new shares). The number of the existing shares is collected from the prospectuses (if available), Nominus database, or Worldscope (05301). The *OffSize* is used to examine the slope of the demand curve and how this might affect the reported *AR*. The new share issue increases the stock supply permanently. If the stock has inelastic demand, it will cause downward pressure on the market price. (i) If the stock has inelastic demand, its demand curve will be downward sloping. In such case, the relative offered size will be negatively related to the offered discount and to announcement (and/or issue) *AR*. (ii) If the increase in stock supply causes permanent downward pressure, negative

	relation to the long-term *AR* should be observed.
Pr*oceeds*	According to Scholes (1972), the value of the distribution is "another measure of increased supply". It is the natural logarithm of the gross proceeds *[Proceeds=ln(GP)]* of the placing as collected from the news reports/ prospectus. Gross proceeds equal the placing price multiplied by the number of placing shares. (i) If the increase in stock supply cause temporary price pressure, negative (positive) relationship to short (long)-term *AR* is expected. As noted, such possibility is inconsistent with the overall private placing reversal, however the information released along the placing announcement could change the *AR* path for individual stocks. (ii) A positive relationship of proceeds with the stock *AR,* should certify the stock offer. Thus, no significant relationship to long-run *AR* is expected unless miss-pricing is possible.