Macro and micro determinants of seasoned equity offerings and issuer stock market performance

Finance

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ABSTRACT
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PURPOSE OF THE STUDY

The purpose of the thesis is to provide new evidence on seasoned equity offerings (SEO) in general, and to address the partially lacking understanding of the SEOs in the UK. This thesis contributes to the ongoing discussion on causes of SEOs by being one of the first studies to investigate the macro level determinants. The thesis also addresses the question at the micro level by comparing SEO firms to firms who choose to issue debt instead. Finally, the thesis examines the firm-specific pre-issue factors that contribute to the abnormal stock market performance of the issuers around the announcement of an SEO and in the long-term following an offering.

DATA

The data on seasoned equity offerings employed in the thesis is sourced from Dealogic and consists of UK seasoned equity offerings during period 1994-2008, while the total number of SEOs amounts to 2,670. At the firm-specific level, the availability of various data items shortens the sample period to range from 1999 to 2007, while the total number of events amounts to 543. Data on various firm characteristics and accounting items is retrieved from Thomson Financial Worldscope, and data on analyst recommendations from Thomson Financial I/B/E/S history. Finally, data on stock prices, market indexes, interest rates and various economic fundamentals are from Datastream.

RESULTS

Results indicate that at the macro level, firms choose to conduct an SEO following periods of high stock market returns, and at times of rapid future sales growth among the listed firms, suggesting that market timing and demand for capital hypotheses of equity issuance hold. At the micro level, firms choose to issue seasoned equity for much of the same reasons, while in addition, information asymmetry seems contribute to the decision.

Market timing, and to a lesser extent, demand for capital proxies have a positive linkage with SEO announcement effect. The findings also indicate that firms exploit window of opportunity to issue equity, since high volume period issuers undergo higher abnormal returns than low volume period issuers. In the long-term, the UK SEOs underperform in general, while the abnormal returns using market-to-book and firm size matched firms as the benchmark are less negative than suggested in the previous literature on the UK SEOs. Finally, the findings indicate that firms with ex ante demand for capital do not suffer from long-term underperformance, while market timers and firms with large issue sizes appear to be poor long-term investments.

KEYWORDS

Seasoned equity offerings, determinants of equity issue, event study, announcement effect, long-term underperformance

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TAVOITTEET

Tutkielman tavoitteena on tuottaa uutta tutkimustietoa osakeantien determinanteista ja tarkastella osakeannin toteuttavien yhtiöiden suoriutumista osakemarkkinoilla yrityksen tuntomerkkien näkökulmasta. Tutkielma on ensimmäisiä osakeantipäätöksiin vaikuttavia makrotekijöitä kartoittavia akateemisia tutkimuksia. Lisäksi tutkielman tarkoituksena on määrittämää yrityskohtaisia, mikrotason tekijöitä, jotka selittävät miksi jotkut yhtiöt päätyvät tekemään osakeannin, ja toiset puolestaan nostamaan lisää vierasta pääomaa. Tutkimuksen tavoitteena on niin ikään määrittää osakeannin toteuttavien yhtiöiden epänormaaleihin tuottoihin vaikuttavia yrityskohtaisia tekijöitä osakeannin julkistus hetkellä, ja pitkällä aikavälillä annin toteuttamisen jälkeen.

AINEISTO

Tutkimuksen aineisto koostuu Lontoon pörssissä listattujen yhtiöiden vuosien 1994 ja 2008 välillä tekemistä osakeanneista, jotka on haettu Dealogic tietokannasta osakeantien kokonaislukumäärän ollessa 2,670. Yrityskohtaisella tasolla datan saatavuus rajoittaa tarkastelun kohteena olevan ajanjakson määrittyvän välille 1999–2007 osakeantien kokonaismäärän ollessa 543. Yrityskohtaiset taloudellisia muuttujia ja tunnuslukuja kuvaava tieto on peräisin Thomson Financial Worldscope tietokannasta ja analyytikkojen suositukset I/B/E/S history tietokannasta. Lisäksi käytössä ollut osakekurssidata, korkodata ja eri kansantalouden muuttujia kuvaava tieto on peräisin Datastream tietokannasta.

TULOKSET

Tulokset osoittavat, että makrotasolla tärkeimmät osakeanteihin vaikuttavat tekijät ovat osakemarkkinoiden tuotto ja listatuttujen yhtiöiden tulevaisuuden liikevaihdon kasvu. Näin ollen markkinoiden ajoittaminen ja rahoitustarve vaikuttavat positiivisesti osakeantien lukumäärään. Mikrotasolla osakeannin toteuttavat yritykset ajoittavat markkinaa ja tarvitsevat pääomaa, aivan kuten makrotasolla, mutta lisäksi tiedon epäsymmetria vaikuttaa negatiivisesti osakeannin toteuttamispäätökseen.

Osakeannin julkistamisen aiheuttamaan epänormaaliin tuottoon vaikuttavat sekä markkinan ajoittaminen että rahoitustarve. Lisäksi yhtiöt hyödyntävät korkean osakeantivolyymin periodeita, jolloin yritysten epänormaalit tuotot julkistushetkellä ovat verrattain korkealla tasolla. Osakeannin jälkeen yritykset alisuoriutuvat pitkällä aikavälillä, mutta negatiiviset epänormaalit tuotot eivät ole niin suuria, kuin aikaisemmassa kirjallisuudessa on raportoitu. Pitkän aikaväliin osakemarkkinoilla suoriutumiseen vaikuttavat sekä osaketuotot ennen osakeantia että yrityksen rahoitustarve. Yhtiöt, joilla on kova pääomantarve, eivät alisuoriudu pitkällä aikavälillä, ja ovat näin ollen parempia osakesijoituksia, kuin markkinoita ajoittavat opportunistit.

AVAINSANAT

Osakeannit, markkinan ajoittaminen, rahoitustarve, pitkän aikavälin alisuoriutuminen

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1 INTRODUCTION

1.1 Background and motivation

Seasoned equity offerings (SEO) have an important role in the world of finance regardless of the perspective of the observer. The equity offerings by seasoned firms have continuously been one of the most researched topics among academics, firms' key financing decisions or alternatively, great source of income for investment bankers. SEOs have been one of the key areas of research in the field of corporate finance due to their significance as the firms' financing event and somewhat anomalous stock market performance of equity issuers. Numerous authors document stock price run-up before equity issuance, negative response from the investors to the public announcement of the issue and finally, and also probably most strikingly, issuers continue to underperform their non-issuing peers for up to five years after the issue. Consequently, SEO announcements clearly represent a signal to investors similarly to other corporate events, but at the same time, not all the investors adjust their valuations to correct level as issuers continue to underperform various benchmarks. Traditional financial theories on capital structure, such as pecking order and tradeoff theory, cannot fully explain the empirically observed stock market performance of the issuers. The inability of the traditional theories has given rise to a series of new attempts to explain the SEO mechanisms.

Equity issues have been found to occur in cycles as great majority of the SEOs and initial public offerings (IPO) tend to take place during hot periods, followed by times of low issuance volumes. Baker and Wurgler (2000) find that aggregate equity share in total capital issuance is a strong predictor of future market returns as high equity share in all new issues is often followed by exceptionally low returns. Similarly, Bayless and Chaplinsky (1996) find hot market issues and cold market issues to differ in quantity and issuer characteristics. Existing literature suggest various motives for firms to issue equity and thus, the equity cycles to exist. Firstly, Baker and Wurgler (2002) find that managers' superior information gives them edge to make an attempt to time the equity market. Managers choose to issue equity when company is trading above its intrinsic value and repurchase shares at other times. Second, Dierkens (1991) on the contrary states that when information asymmetry between managers and shareholders is large, the adverse selection costs of issuing equity are at their highest. High information asymmetry sways firms to look alternative ways to finance the projects as they are in afraid of a negative response from the investors. Third, according to

Choe, Masulis and Nanda (1993) firms' investment opportunities, the demand for capital, can also have a large impact on the equity issuance decision. When the economy is booming, firms are likely to see a variety of promising positive NPV projects and consequently, shareholders have higher probability to gain adequate return on their investment, if they choose to invest more in the firms' stock. Lastly, Lowry (2003) finds that investor sentiment is an important determinant for firms to go public, and therefore, it is reasonable to assume that the mechanism for follow-on offerings could be similar.

Investigation of issuer stock market performance has motivated numerous papers. Asquith and Mullins (1986) first report the negative market reaction to SEO announcement, while Loughran and Ritter (1995) throw light on the long-term underperformance of SEO firms. Thereafter a number of authors have replicated their findings, but the topic of interest has partly shifted from quantifying the performance to explaining the observed returns. Loughran and Ritter (1997) show deterioration in issuers' operative performance to cause the underperformance, while Baker and Wurgler (2002) assume market timing of managers to account for the phenomenon. Fama (1998) questions the findings on post-issue underperformance and explains the stock price patterns to result from using inadequate models to measure abnormal returns.

However, the recent findings in the area of SEOs by Dittmar and Thakor (2007), DeAngelo, DeAngelo and Stulz (2007) and Alti and Sulaeman (2008) suggest that the SEO mechanism, both in terms of determinants of SEOs and the performance of issuers, has not fully been understood. The market timing theory continues to be among the leading theories in the literature on capital structure and motivation for SEO decision, but a debate goes on about the correct specification of the theory, and the characteristics of the firms that are likely to opportunistically time the market. Dittmar and Thakor (2007) state that the questions of why and when companies issue equity are still partly unanswered, as the recent attempts to address the questions have exposed gaps between stylized facts and traditional theories of capital structure and security issuance.

A great majority of the studies on SEOs employ US data and Andrikopoulos (2009) concludes that the understanding of SEOs in context of the UK market is still fairly limited. Employing UK data, Slovin, Sushka and Lai (2000) and Barnes and Walker (2006) study the impact of the floatation method choice on stock market reaction to SEO announcement and report

negative announcement effect for rights issues and positive market reaction for private placements. Ngatuni, Capstaff and Marshall (2007) investigate the long-term post-issue stock market performance with a sample of UK rights issues, and report significant underperformance for up to five years following an issue. Therefore, the US phenomenon seems to hold also in the UK. Furthermore, Andrikopoulos (2009) studies the weakening of the operative performance as a cause for post-issue long-term underperformance. He reports that firms time equity issues for periods when their operative outlook seems most favorable. As it appears, the UK evidence on stock market performance of equity issuers has broadened during the past few years. Yet, the determinants of equity issues have not been studied neither from the macro nor micro perspective, and the issuer stock market performance have not been fully explored.

1.2 Research questions

This thesis provides evidence on the determinants of equity issues from two perspectives: first, I investigate the factors driving the changes in SEO volume as an economy-wide phenomenon and second, by comparing the attributes of firms that decide to issue equity with those who choose to use alternative ways of financing.[1] In addition, I analyze the performance of equity issuers around the public announcement of the SEO and in the long-horizon by making an effort to quantify the impact of pre-announcement issuer characteristics to the stock market performance of the issuers. The most central research questions can be summarized in the following way:

i) Which theories of those suggested in the corporate finance literature explain the economy-wide fluctuation in the UK SEO volume?
ii) What are the firm characteristics that relate to the decision to issue equity?
iii) How does the UK sample of equity issuers perform in the stock market around the announcement and in the long-horizon?
iv) What is the link between firm-specific issuer characteristics and the stock market performance of the issuers?

I perform time-series regression to study SEO macro determinants by following Lowry (2003) and Pastor and Veronesi (2005), who pool various theories on IPO issuance together and

[1] I use terms economy-wide and macro interchangeably when referring to the whole UK equity offering market. I also use terms firm-specific, micro and cross-sectional interchangeably when discussing the SEOs from a perspective of a single firm.

analyze the macro determinants of IPOs. In addition, I study the micro level determinants of SEOs by means of logit regression. Finally, I employ traditional event study methodologies to measure the impact of pre-issue firm characteristics on the stock market performance of SEO firms around the announcement and in the long-term.

1.3 Contribution to the literature

This thesis contributes to the prior literature in several ways. The thesis addresses the impact of different macro level determinants on the SEO volume following the unpublished working paper by Howe and Zhang (2009), which is the first attempt to study the fluctuation in SEO cycles from multiple theories' perspectives. The thesis also pools together the macro and micro level factors to study the determinants of SEOs from both perspectives, while the prior literature focuses on either one of the perspectives, and mainly US evidence on topic exist (see, e.g., Bayless and Chaplinsky (1996), Jung, Kim and Stulz (1996), Dittmar and Thakor (2007)). In addition, the thesis shows that the ex ante firm characteristics have explanatory power in explaining post-issue underperformance of SEO firms, while the existing literature concentrates on overvaluation and post-issue deterioration of operative performance as the primary causes of the phenomenon (see, e.g., Loughran and Ritter (1997), Andrikopoulos (2009)).

By being a thorough investigation on various SEO phenomena, the thesis adds to the literature on UK SEOs in multiple ways. To my best knowledge, none of the earlier studies addresses the determinants of seasoned equity offerings in the UK. In addition, the thesis contributes to the existing UK studies on SEO firms' stock market announcement effect, such as Slovin et al. (2000) and Barnes and Walker (2006), by employing ex ante firm characteristics that support various hypotheses on equity issuance as determinants of issuer stock market performance. Finally, the thesis provides new evidence on SEO firms' post-issue underperformance. The earlier thorough investigations by Ngatuni et al. (2007) and Ho (2005) analyze the role of floatation method choice on the stock market performance of the issuers, but neither of the studies analyzes the role of issuer characteristics on the stock market performance.

1.4 Results

I find evidence that support market timing and demand for capital hypotheses as the macro level determinants of equity issues. When public firms' future sales growth is rapid, firms

seek for external financing and SEO volume increases impressively. On the other hand, when the risk-free rate is low, firms have positive NPV projects available and the need for external financing increases through the discount rate channel. Also, firms issue equity after periods of high stock market returns. Specifically, my findings indicate that the past 12-month stock returns positively contribute to the macro SEO volume. At the micro level, market timing, information asymmetry and demand for capital all seem to have strong impact on the likelihood of using SEO as a means of financing. Besides, an analysis of the issuer announcement effect reflects that market timers are likely to face more optimistic market reaction than poor market timers. The role of past stock returns persists after various robustness checks. Interestingly, issuers during high periods of issuance volume undergo more optimistic market reaction than cold period issuers, but the results are driven by top quintile of issues taking place during the highest volume periods. I also find some evidence that SEOs by firms with high demand for capital are interpreted as positive news, while the reversal is true for low demand for capital firms. Finally, an analysis of the post-issue performance reveals that market timers are good investments during periods of 12 months or less while they begin to underperform at longer horizons. Firms with high demand for capital do not underperform their non-issuing peers, which suggests that some firms have a fundamental need for the issue and can put the proceeds into an efficient use. I additionally find that the underperformance seems to increase with the issue size and investors have some ability to pick the winning SEOs at the time of announcement.

Earlier literature on IPO determinants conducted using US data reports similar factors to drive macro volume changes as I find to be the case with the UK SEOs (see, e.g., Lowry (2003), Pastor and Veronesi (2005)). At the micro level, US studies, such as Jung, Kim and Stulz (1996), report high leverage, past stock returns and market-to-book to be the strongest determinants of a firm choosing to issue equity over debt. I report similar findings and add a number of interesting results: analyst coverage, financial slack, sales growth and volatility seem all to be positively related to the likelihood of an equity issue decision. The existing literature is not unanimous on the firm characteristics affecting announcement effect of SEOs (see, e.g., Bayless and Chaplinsky (1996), Dittmar and Thakor (2007), Alti and Sulaeman (2008)). I confirm that the hot period issues seem to face more positive market reaction at the announcement and strong market timers with anticipated SEOs face positive interpretation by the stock market. In addition, the sales growth appears to have a positive but non-monotonic impact on the market reaction in the UK similarly to the US. Namely, Denis (1994) reports

subsamples of extreme performers to drive the phenomenon. Lastly, while existing literature mainly concentrates on the deterioration of operating performance following an issue (see, e.g., Loughran and Ritter (1997), Andrikopoulos (2009)), I report pre-issue characteristics to have explanatory power in post-issue performance of SEO firms.

1.5 Limitations of the study

This thesis is subject to two sources of limitations typically present in event studies to a certain degree. First, extensive requirements on data availability force to exclude significant proportion of SEOs out of the final sample due to missing key data items. Second, the long-term event studies have been criticized for the model misspecification and inadequate benchmarks to measure the normal returns, both of which can bias the results in the long-term. As it comes to the data availability, there's not much that can be done to avoid the problem. Overall, I consider the sample of SEOs of adequate size and reasonably well representative of the UK equity market activity. To overcome the second limitation, I employ and report results using two different models both in short-term and long-term event study. Moreover, short-term abnormal returns are based on often used market model and plain market adjusted returns, while I calculate long-term abnormal returns using both 1) FTSE All-Share stock index and 2) size and market-to-book matched firms as the benchmark for normal returns.

1.6 Structure of the study

The rest of the thesis is organized as follows. Chapter 2 highlights the relevant literature on equity issue determinants and the reported empirical evidence on issuer stock market performance. Chapter 3 motivates and presents the hypotheses tested in the thesis. Chapter 4 presents the data collection process and the final data sample used in the study. Chapter 5 reviews the methodologies employed. Chapter 6 shows and discusses the empirical results. And finally, chapter 7 concludes the thesis.

2 LITERATURE REVIEW

This chapter highlights the most relevant literature from the area of seasoned equity offerings. The first section concentrates on traditional theories of capital structure, while the second section summarizes the literature on the drivers of the SEO cycles and the determinants of

SEO decision. Finally, the third section summarizes the evidence on the stock market performance of the issuers around the announcement of the issue and in the long-term following an issue.

2.1 Theories of capital structure

In this section, I demonstrate the evolution of capital structure theories presented to explain the firm financial policy. Moreover, capital structure theories have relevance from capital issuance's point of view, as the same theories have laid the foundation on explaining how a firm facing a need of external capital chooses between alternative ways of financing and additionally, how the stock market reacts to the public announcement of the issue.

The extensive literature on modern capital structure theory started from Modigliani and Miller's (1958) arguments of irrelevancy of capital structure. Moreover, firm value was stated to be unaffected by the chosen capital structure. Provided that a certain set of circumstances is met, their argument is that one capital structure in no better than the other. Modigliani and Miller framework, however, is based on demanding assumptions, such as no asymmetric information and efficient markets.

In response to the neutrality of capital structure, Myers and Majluf (1984) present the pecking order theory of capital structure according to which a firm chooses to use internal capital to finance a project whenever possible and also, when external capital issue is required, the firm prefers riskless debt to risky debt and finally, risky debt to equity. Myers and Majluf (1984) show that if the managers have superior information and the company does not have financial slack or unused debt capacity, the managers may choose to reject a positive NPV project, given that the company would be forced to issue equity to finance the project. The theory implies that some companies having a positive NPV project choose to forgo it as company equity is undervalued and dilution costs of the SEO outweigh the NPV of the project. On the contrary, others choose to forgo the project only if debt can be issued. The reluctance to issue equity whenever the firm's common stock is underpriced, the authors state, is a result of asymmetric information. Consequently the market reaction to equity issue decision is likely to be negative as it reveals management seeing company equity being overvalued. Pecking order theory has been criticized by Fama and French (2005) due to its inability to explain why in reality a large proportion of companies issue equity. Fama and French conclude that in their

sample, between 1993 and 2003, 86 % of companies decided to issue equity and more than 50 % of the observations in their sample violate the pecking order theory.

An alternative theory, the tradeoff theory of capital structure, began to develop gradually when a correction to the neutrality of capital structure was presented by Modigliani and Miller (1963). They consider the earlier models on capital structure to be inadequate, since corporate taxation was ignored. Also, Kraus and Litzenberger (1973) and Myers (1977) emphasize the importance of taking market imperfections, such as bankruptcy penalties and taxation on firms' profits, better into consideration. Contrary to earlier theories of capital structure, the basic principle of the tradeoff theory assumes that a firm's capital structure will be gradually guided toward optimum because its capital issue decisions are balanced between marginal costs of debt (increased bankruptcy risk) and marginal benefits (tax shields) of debt. The strength of tradeoff theory lies in its ability to explain cross-sectional differences in borrowing – safe and tangible generally borrow more, while risky growth firms face high risk of bankruptcy and choose to borrow less. Adding taxes to the analysis, Modigliani and Miller (1963) argue, implies more levered capital structures. The authors also point out that unexamined real-life patterns reflect the fact that it is in the companies' interest to maintain financial flexibility in form of borrowing capacity.

Tradeoff theory has taken leaps towards its current format over time as various authors test the implications of the theory on real life patterns. Myers (1977) considers a situation where a firm facing a positive NPV project has an excessive amount of debt. He states that the company may have to forgo the opportunity as issuing more debt would imply high risk of default and new equity may not be available as the equityholders would have to bear the costs if the project failed. Myers (1977) therefore introduces the debt overhang problem. On the other hand, Hovakimian, Opler and Titman (2001) find empirical results suggesting that debt overhang works as an impediment to adjust leverage towards firm's target capital ratio. Finally, Jensen (1986) considers a situation with a firm having too much equity and suggests that large free cash flow in existence of interest payments worseness the possible agency conflicts between managers and different claim holders of the firm.

Despite its ability to explain some real world patterns, the tradeoff theory has been criticized extensively. Myers (1984) claim that if the tradeoff theory was true, firms would not have as low leverage ratios as they in reality appear to have. Shyam-Sunder and Myers (1999) are of

the opinion that traditional pecking order model provides a better illustration of firms' capital structure policies than tradeoff theory. Further, the practical evidence on a number of firms giving up valuable debt tax shields contradicts with the theory's building blocks. On the contrary, one of the implications of the tradeoff theory is that an increasing stock price leads to lower leverage and consequently, should guide the company into debt issuance. However, numerous authors, for instance Baker and Wurgler (2002) and Jung et al. (1996), point out that the increase in stock prices actually improves the likelihood of issuing equity. The pecking order and tradeoff theories continue to be an area of interest in finance literature and have continuously been debated (see, e.g., Fama and French (2002), Frank and Goyal (2008)). The consensus of authors is that the pecking order and tradeoff theories have been the dominant theories in capital structure and only the improved understanding of the dynamic aspects of capital structure have made the theories less compelling.

The tradeoff theory's weaknesses have stimulated a number of authors to aim to better account for firms' actual capital structure policies in their theoretical capital structure frameworks. In response to the traditional static tradeoff theory, Fischer, Heinkel and Zechner (1989) and Lucas and McDonald (1990) discuss an alternative version of capital structure theory, dynamic tradeoff theory. According to the dynamic tradeoff theory, firms can deviate from their optimal capital structure to the extent that the transaction costs of capital structure adjustment outweigh the costs of deviating from optimal structure. Fama and French (2002), however, point out that firms are fairly slowly adjusting their capital structures, which suggest that suboptimal capital structures can exist for long periods of time. On the contrary, Leary and Roberts (2005) claim that firms actively adjust their leverage towards target.

Market timing theory of the capital structure is a novel alternative for the predominant theories. To clarify, the empirical evidence on security issuance has documented firms to issue equity when their market prices are high and repurchase shares when low. Hovakimian et al. (2001) While market timing of equity issuers is fairly old and approved phenomenon, Baker and Wurgler (2002) show that the impact of firms' security issuance market timing on observed capital structures is persistent. Consequently firms' capital structures are cumulative outcomes of their past market values. Baker and Wurgler (2002) use market-to-book as the measure of firm valuation level and conclude that if no single optimal capital structure exist, then managers do not need to reverse the market timing decisions when firm's market-to-

book shifts back to a lower level. Therefore, historical market timing can be a determinant of the current capital structure.

Hovakimian (2006) questions the findings of Baker and Wurgler as he finds no significance evidence of market timing pattern for debt issues and debt reductions. In addition, the equity market timing does not seem to have a long-lasting impact on firms' capital structures. Or to be more precise, the relation between market-to-book and capital structure does not imply such an impact to exist, contrary to Baker and Wurgler's (2002) findings. Hovakimian (2006) also finds that the market-to-book ratios of equity issuers are significantly higher than debt issuers during all the years in his sample. The finding suggests that the negative effect of market-to-book on leverage seems to be cross-sectional rather than time-series phenomenon and more likely to reflect changes in growth opportunities than market timing. Kayhan and Titman (2007) and Leary and Roberts (2005), on the other hand, argue that firms actually rebalance their capital structures towards a target, while Fama and French (2002) and Huang and Ritter (2009) show that rebalancing occurs fairly slowly and therefore, the shocks in the market values have long-lived influence on observed capital structures. Nevertheless, the role of market timing on firms' observed capital structures remains somewhat unsettled issue in corporate finance literature.

2.2 Empirical evidence on determinants of SEOs

In this section, I present the various theories proposed to motivate firms to issue seasoned equity. The aggregate volume of equity issues, or the equity issue cycles, has been examined by numerous authors. Majority of the existing literature positions itself with a single explanation for the fluctuation in volumes. The literature on most often argued explanations for the fluctuation in equity issuance activity (market timing, demand for capital, information asymmetry and to a lesser extent investor sentiment) is summarized in the following subsections. IPO cycles tend to fluctuate together with SEO cycles, yet in the case of IPOs more dramatic shifts between hot and cold cycles occur. Due to the obvious conformity in IPO and SEO determinants, I summarize also some of the main theories on IPO cycles that have relevance for SEOs.

2.2.1 Market timing

Several perspectives have been taken to justify the market timing hypothesis in equity issuance. Marsh (1982) studies a sample of UK firms facing equity vs. debt decision. He finds

that firms' decisions are heavily influenced by past securities prices and current market conditions as well as target leverage levels. Lucas and McDonald (1990) state that equity issues seldom take place when management sees firm's equity being undervalued. Jung et al. (1996) show equity issuing firms experiencing positive abnormal 11-month returns before the issue. Moreover, higher equity issue volumes occur at times of high recent stock market performance, and are often aligned with rising economic activity. Finally, Hovakimian et al. (2001) find that firms with high past stock returns are likely to issue equity and retire debt, while firms with low past stock market performance are reluctant to issue equity.

Baker and Wurgler (2000) investigate the time series variation of equity issues' share in total new capital issues and find that the peaks in equity issue volume occur at times of high past aggregate market values, just before periods of low market returns. They claim that the strong presence of market timing by managers violates the efficient market hypothesis. The authors additionally argue that the equity share in new issues is an efficient predictor of one-year-ahead market returns. Baker and Wurgler (2002) elaborate four sources of distinct evidence for market timing of equity issues: Firstly, actual financing decisions by firms tend to be dominated by equity issues at times of high market values and debt issues when market values are low. Secondly, analyses of post-issue performance (see, e.g., Loughran and Ritter (1995) and Spiess, Afflec-Graves (1995)) reveals successful market timing due to low post-issue returns. Third, analyses of earnings forecasts and realizations show that equity issues tend to occur when investors in general are over-optimistic about firms' prospects. Finally, survey by Graham and Harvey (2001) reveals CFOs to exploit high market values by issuing equity.

Despite the obvious presence of market timing as a factor affecting the SEO decision, the market timing hypothesis has continued to be a widely examined phenomenon. A new area of studies aims to better understand the role of market timing in equity issuance. Dittmar and Thakor (2007) state that the managers are likely to issue equity at times of high past stock returns provided that shareholders' views on the project payoff are aligned with the management. Moreover, managers want the likelihood of agreement with investors to be as large as possible, otherwise firms prefer issuing debt. Alti and Sulaeman (2008) investigate the link between institutional demand and market timing. Moreover, their findings indicate that high past stock returns lead to an increased likelihood of equity issue only when the firm contemporaneously faces high institutional demand.

Hot issue markets in IPOs have been studied extensively. Ibbotson and Jaffe (1975) define hot issue markets as periods where new issues constantly earn remarkable abnormal returns during the first month after listing, and conclude that such returns could be predictable and provide investors with high returns. Lowry and Schwert (2002) find that there is a strong relation between IPO initial returns and the following number of IPOs. The authors claim that similar firms tend to conduct an IPO at about the same time. Furthermore, the deal specific information on the IPO during registration period becomes gradually public, and has an impact on other firms' pricing and decisions to go public, which implies that market timing and benchmarking of peers jointly lead into a high IPO volume and a reduction in the probability of a deal failure. Ritter and Welch (2002), on the other hand, claim that IPOs tend to occur at times of higher aggregate market values. Lowry (2003) studies fluctuation in economy-wide IPO volume and finds that stock market variables are strongly related to number of IPOs. Namely, various combinations of market-to-book and stock returns have significant impact on the number of IPOs. Finally, Pastor and Veronesi (2005) conclude that IPO waves tend to occur after periods of high market returns and to be followed by fairly low returns.

2.1.2 Investment related demand for capital

Traditional pecking order theory implies that adverse selection problem is likely to be large when firms do not have promising investment opportunities. Further, cost of issuing equity picks up when the lemons problem, making a distinction between good and bad investment project, grows in importance. In general, the adverse selection problem is material when the economy is in downturn, and according to pecking order theory, firms should prefer using internal capital or issuing risk-free debt. Therefore, the general level of demand for capital can be seen as a possible determinant on the equity issue decision. (Myers and Majluf (1984) and Choe et al. (1993))

Choe et al. (1993) examine time series predictions on the determinants of equity issues and the impact of issuer characteristics on the announcement returns. Accordingly, equity issues occur at times when adverse selection costs are at their lowest. The low adverse selection cost periods are likely to occur when economy is booming and firms have promising investment opportunities. Choe et al. (1993) report evidence supporting the adverse selection hypothesis and conclude that the equity share in all new issues increases in expansionary business cycles. In addition, when the impact of business cycle variables are correctly controlled, neither past

stock returns nor interest rates is found to be significantly related to equity issuance. In other words, they argue that the impact of business cycle variables actually causes the linkage between the proven strong impact of stock market variables on equity issuance.

Bayless and Chaplinsky (1996) find that hot SEO market issuers have high demand for capital and therefore, issuing equity seems well motivated from the investors' perspective. Similarly, Lowry (2003) studies the fluctuation in the IPO volume by means of aggregate and industry level time-series regressions. Her findings indicate that both demand for capital and investor sentiment are important factors contributing to the number of IPOs. Furthermore, when demand for capital increases, a rise in IPO volume is likely to occur and similarly, ceteris paribus, firms tend to go public when investor sentiment is high. Finally, Brau, Ryan, and DeGraw (2006) investigate the link between the financial theories and CFO perceptions of IPO firms'. The survey reveals that demand for capital and future access to seasoned equity motivates firms to go public.

2.1.3 Asymmetry of information

In response to the static tradeoff theory, Myers and Majluf (1984) and Myers (1984) argue that asymmetric information plays a key role in firms' capital issuance decisions. Moreover, asymmetric information pushes firms to follow the financing pecking order, according to which internally generated capital is always preferred to external capital and debt preferred to equity. Namely, the information asymmetry of debt capital is less detrimental as opposed to the equity. However, empirical evidence to support the time-varying asymmetric information costs as the explanation for the existence of equity cycles is quite limited, yet some authors point to its direction as the primary SEO determinant.

According to Bayless and Chaplinsky (1996), firms could see periods of low asymmetric information as a window of opportunity to issue equity. They define window of opportunity to exist when the information asymmetry is at historically low level in the whole economy. In such periods firms are able to signal their value and intent to investors more precisely. One such signal could be an intensive capital expenditure program, in which case the investors could easily verify firm's need for capital, and make a distinction from a situation where the main motivation to issue equity is purely opportunistic stock overvaluation. In these circumstances, demand for capital and information asymmetry hypotheses partly overlap and it can be impossible to completely distinguish between the consequences of each of them. The

authors further report that investors respond differently to the firm characteristics of equity issuers in hot and cold markets and conclude it as an indirect evidence of information asymmetry playing a role in equity issuance. Namely, investors pay more attention to variables of firm quality and future prospects, such as market-to-book ratio, during the cold periods.

Dierkens (1991) studies the information asymmetry between managers and investors and its implications on equity issuance. She builds on the assumption that managers have superior information on firm specific events which in turn creates information asymmetry. Moreover, the problem of asymmetric information rises in importance every time the firm seeks external funding from the capital markets. The hypothesized proxies of information asymmetry are the stock market reaction to earnings announcements, residual variance of the stock returns, intensity of public announcements and intensity of trading. Dierkens (1991) concludes that the proxies of information asymmetry are significantly related to the announcement effect and timing of SEOs. Choe et al. (1996), on the other hand, find that stock price run-up and low stock return volatility are both determinants of high equity issue activity and conclude that those variables reflect decreased information asymmetry.

The first studies on the role of information asymmetry in equity issuance concentrate on the economy-wide relations. To better understand the impact of information asymmetry on security issue decision at the cross section, a new arm of studies investigates the impacts of temporal variation in firm-specific information asymmetry. D'mello and Ferris (2000) report negative relation between analysts' forecast dispersion and the SEO announcement return. Their findings imply that firms with less uncertainty for future prospects are better off when issuing equity as opposed to the firms with larger uncertainty. Autore and Kovacs (2009) hypothesize that the firms having severe information discrepancy between management and investors in general are likely to time the equity issues for periods of lower discrepancy. They find cross-sectional measures of information asymmetry to be strongly linked to the equity issuance, lower information asymmetry implying an increased likelihood of equity issue decision. Moreover, further tests reveal that the results are not monotonic by nature, but instead driven by a subsample of firms having high information asymmetry in general. Those firms exploit periods of low asymmetry to conduct an SEO. Finally, Lee and Masulis (2009) use the quality of accounting information as a proxy for information asymmetry. Low accounting information quality theoretically could increase the discrepancy between company

insiders and investors. Namely, insiders know the quality of the firm despite the quality of reporting, while investors' perceptions on the firm are guided by the accounting information. They conclude that the firms with poor accounting information content face larger issue costs and more negative SEO announcement effects than firms of good information quality.

Walker and Yost (2008) study the determinants of SEO decision and the use of proceeds. They find that regardless of what firms say, they are likely to increase capital expenditures, research and development expenditure and long-term borrowing after the issue. Interestingly, the authors find that if the firm provides specific plans for the uses of proceeds, investors are more optimistic (less negative) around the SEO announcement. Moreover, investors value marginal dollar in a firm more if managers do not have excess cash and large discretion over the uses of funds. Their findings indicate that asymmetric information between management and shareholders, the principal-agent problem, is an essential component of the SEO decision and a determinant of the stock performance around the announcement of the issue.

Dittmar and Thakor (2007) suggest a model of equity issuance building on both market timing and information asymmetry arguments. The empirical investigation of the hypothesized model yields the following results: First, firms issue equity after increases in stock prices. Second, firms also issue equity when proxies on managers' and equityholders' perceptions on the firm prospects are aligned regardless of the stock performance. Finally, they conclude that the agreement between shareholders and management has explanatory power in SEO decision even after controlling for the level of stock returns. Dittmar and Thakor (2007) therefore combine two among the most influential theories of equity issuance and show that the determinants of SEOs have not yet been fully explored.

2.1.4 Investor sentiment

A more recent area of interest in behavioral corporate finance addresses the impacts of investor sentiment in the stock market. To date, investor sentiment has been found to be present in the contemporaneous stock returns, and also to some degree, have predictive power in the future aggregate stock returns (see, e.g., Baker and Wurgler, (2006) and (2007), Fisher and Statman, (2000)). Growing body of research takes either "irrational investors approach" or "irrational managers approach" and explain some aspects of the behavioral corporate finance from either one of the two perspectives (Baker, Ruback and Wurgler, 2005). The evolution of studies about the role of investor sentiment has evolved over time and according

to Baker et al. (2005), the question no longer is whether investor sentiment is present, but merely, how to measure it and to quantify its influences.

Lowry (2003) studies macro level determinants of IPOs and suggests that over-optimism among small investors implies a greater likelihood to participate in an equity offering. Knowing the general level of investor sentiment in the economy, firms could exploit fluctuations in sentiment to time the equity offerings for periods of high sentiment. Lowry (2003), using data on closed-end-fund discounts, finds investor sentiment to be an important determinant of IPO volume. Ljungqvist, Nanda and Singh (2006) propose an alternative theory on IPO issuance in which sentiment investors' demand play a crucial role. Further, sentiment investors' demand provides regular investors with exit opportunities and guarantees that regular investors are interested in getting an allocation in new issues, if those are underpriced on average. Underpricing compensates the regular investors for bearing the risk of a rapid decline in investor sentiment, which can lead to sentiment investors vanishing from the market. The theory of Ljungqvist et al. (2006) is consistent with both underpricing of IPOs and the role of investor sentiment as an equity issue determinant.

2.1.5 Firm specific issuer characteristics

This subsection pools together the key firm characteristics that relate to the likelihood of equity issue decision. Along with the four distinct hypotheses on the determinants of SEOs presented in the previous subsections, an SEO decision strongly relates to certain firm-specific factors. According to Bayless and Chaplinsky (1996) a typical equity issue type firm experiences less negative abnormal returns around the announcement as opposed to a firm with typical debt issuer characteristics when issuing seasoned equity. Moreover, the authors claim that the characteristics closely related to the increased likelihood of an equity issue, or being an equity issue type firm, are low financial flexibility (cash flow over all positive NPV investments), high recent stock price performance, low tax benefit of debt, high costs of financial distress and small firm size. Similarly Rajan and Zingales (1995) identify a set of variables that are closely related to the firm leverage: market-to-book ratio, asset tangibility, firm size and profitability. DeAngelo et al. (2007) and Leary and Roberts (2005) point out that equity issuing firms are often financially constrained. They use Altman's Z-score to capture the effect of missing financial flexibility.[2] Finally, Jenter (2005) finds that seasoned

[2] Leary and Roberts (2005) specify Altman's Z-score as the sum of 3.3 times earnings before interest and taxes plus sales plus 1.4 retained earnings plus 1.2 times working capital, all divided by total assets.

equity offerings coincide with insider selling. His findings are consistent with market timing based theories on equity issuance according to which the management holds information that investors do not have.

Dittmar and Thakor (2007) discuss the control variables to be used in the tests of firm financial policy. They state that in order to distinct between consequences of pecking order and tradeoff theory, a certain set of control variables should be included in the analysis of the financial policy. Moreover, larger firms have lower costs of debt and therefore, natural logarithm of sales should be included as a control variable. Dittmar and Thakor (2007) and Rajan and Zingales (1995) argue that profitable firms often have higher agency costs associated with debt, and thus return on assets should be used as a control variable. Also, financial slack, defined as cash and cash equivalents divided by total assets, implies lower need for external financing. Firms with research and development expenditures have higher agency costs of debt and should prefer equity over debt. Rajan and Zingales (1995) also point out that firms with high tangibility of assets, measured as property, plant and equipment divided by total assets, are more likely to issue debt. Finally, based on the tradeoff theory of capital structure, firms with high leverage prefer issuing equity due to the increased level of marginal costs of debt.

2.3 Empirical evidence on the stock market performance of the SEO firms

Equity issuers' stock market performance has been studied extensively in the recent literature. Various authors have reported stock price run-ups before offering, negative returns during a short window around the announcement and finally, weak performance in the long-term following an offering. In this chapter, I will highlight the most influential literature on announcement effect, long-term performance and the theories explaining the observed market reactions.

UK equity market has several distinct characteristics from an equity issuer's perspective, which should be noted when analyzing the empirical results. First, the predominant issue method in the US is cash offerings, whereas in the UK, rights offerings remained the usual floatation method choice in SEOs for a long time. Moreover, the rights offerings protect shareholders from diluting their ownership in the firm and thus, enable maintaining the voting rights in the firm regardless of the equity issue. Slovin et al. (2000) concludes that the use of

insured rights offerings exposes the firm for larger adverse selection costs, as the underwriting provided by the third party reveals management concerns regarding a negative stock price performance preceding the decided issue date. Recent studies by Andrikopoulos (2009) and Barnes and Walker (2006) show that the use of rights issues has lessened since the mid-1990s to the detriment of other floatation methods' increasing popularity. Furthermore, the event data sample covering period 1999-2007 that I employ in the thesis contains only 6.1 % of rights offerings. Second, while both US and UK corporate governance systems are considered as Anglo-American type, some differences exist that can have implications for the equity issues. Namely, the UK institutional investors own some 84.7 % (2004) of the total market capitalization, while the similar figure for US amounts to 58.0 % (2002) and additionally, the US CEOs have much higher discretion concerning the firm's decision making. UK institutional ownership is concentrated to the hands of insurance companies and pension funds, both of which are characterized as long-term oriented patient capital as opposed to the mutual funds and investment advisors controlling for the majority of US institutional ownership. (Aquilera, Williams, Conley and Rupp, 2006)

2.3.1 Announcement effect

This subsection pools together the main literature from the area of seasoned equity issuers' abnormal announcement returns.[3] According to the efficient market hypothesis, an announcement that does not reveal information on changes in the firm's cash flow should not stimulate stock price changes. Yet, various theories exist to explain why negative announcement effect of SEOs takes place. On one hand, a new equity issue can decrease firm's leverage and weaken the tax advantages of debt, and on the other hand, an unanticipated equity issue makes firm's debt safer implying a wealth transfer from equityholders to debtholders. As already stated in the previous section, the managements' decision to issue equity reflects information on the firm's intrinsic value. Changes in capital structure of a firm reveal also information regarding the management's perception on the firm's future. Specifically, high leverage is a binding constraint on the firm and signals management's optimism on the firm outlook. Finally, negative announcement effect can reflect the considerably large transaction costs of the new issues. (Modigliani and Miller (1963), Asquith and Mullins (1986), Ross (1977))

[3] Traditionally, the announcement return has been measured during a two-day event window [-1,0] or during a three-day event window [-1,+1]. In the empirical analysis I use the latter, but in the literature review I treat them equivalently.

The literature quantifying the announcement effect of SEO firms has been evolving since mid-1980s as Asquith and Mullins (1986) and Masulis and Korwar (1986) reported significantly negative announcement effects in the magnitude of -3 % respectively. Asquith and Mullins (1986) further state that the observation of negative announcement return can be explained by the decrease in tax advantages, if the issue has a lowering impact on firm's leverage ratio. While the tax advantages of debt is an often noted reason for the negative announcement effect of SEOs, the predominant explanation for the phenomenon is Myers and Majluf's (1984) pecking order theory and its adverse selection implications. Accordingly the announcement of SEO reveals information on management's perception on the firm's intrinsic value, and investors find the information concerning filing an SEO negative. Moreover, the management is likely to see firm's market value to be at a high level relative to its intrinsic value. Both Asquith and Mullins (1986) and Masulis and Korwar (1986) report more negative announcement returns for industrial firms than for public utility firms. They conclude that public utilities firms' lower negative returns may reflect the lower discretion that the management has on timing an SEO. Mikkelson and Partch (1986) find a negative announcement effect well in line with earlier research. They hypothesize that management's decision to conduct an SEO reveals information for the investors as management would cancel the issue if stock turned out to be undervalued at the pre-defined announcement date.

After the first studies to document the negative announcement return on SEOs in the US in the mid-1980s, a number of studies have confirmed that the phenomenon still holds. Slovin et al. (1994) study a sample of firms issuing seasoned equity after becoming listed in the US. They find that the SEO firms have highly concentrated ownership, are reluctant to go to the debt market and earn a significantly negative announcement return. Also Dierkens (1991) reports an average abnormal return of the similar size, yet highlighting that at times of lower asymmetric information the announcement returns are likely to be less negative. According to Eckbo, Masulis and Norli's (2007) thorough survey on SEOs, the average negative abnormal return on SEOs in the US is some 2.2 % and clearly statistically significant.

A number studies aim to provide a more profound explanation for the negative announcement effect of the SEOs. Bayless and Chaplinsky (1996) study periods of high and low equity issuance volume. They find that the SEOs in hot cycles yield negative announcement return on average, but issues during cold cycles yield some 130 basis points more negative

announcement effects. They suggest that the lower negative returns at times of high issuance volume imply lower information asymmetry between managers and investors. Choe et al. (1993), on the other hand, state that the negative announcement returns on equity issues are smaller when economy is booming and information asymmetry is lower compared to times of slow economic activity when more uncertainty in asset prices exist. Walker and Yost (2008) divide firms into subsamples based on their intended use of proceeds. While the total sample experiences a significantly negative announcement return, the firms that are expected to invest the proceeds immediately face on average 50 basis points less negative announcement return.

Table I
Literature on SEO announcement returns

The table summarizes some of the main findings in the area of SEO announcement effect. All the studies employ either [-1,0] or [-1,+1] as the event window. First studies to report the negative announcement effect of SEOs were published in 1986 and the body of literature on topic is continuously increasing.

Author(s)	Sample size	Sample period	Market	Abnormal return
Asquith and Mullins (1986)	392	1963–81	US	-3.00%
Masulis and Korwar (1986)	972	1963–80	US	-3.30%
Mikkelson and Partch (1986)	80	1972–82	US	-3.56%
Dierkens (1991)	197	1980-83	US	-2.40%
Eckbo and Masulis (1992)	1,057	1963–80	US	-2.00%
Choe, Masulis and Nanda (1993)	1,456	1963-83	US	-3.15%[a]
Denis (1994)	435	1977–90	US	-2.49%
Bayless and Chaplinsky (1996)	1,884	1968–90	US	-2.65%[b]
Bethel and Krigman (2004)	2,592	1992-01	US	-2.01%
Heron and Lie (2004)	3,658	1980–98	US	-2.50%
Burton, Lonie and Power (2000)	37	1989-91	UK	-7.76%[c]
Slovin, Sushka and Lai (2000)	296	1986-94	UK	-1.44%[d]
Barnes and Walker (2006)	868	1989-98	UK	-0.33%[d]
Bøhren, Eckbo, and Michalsen (1997)	114	1980-93	Norway	-0.23%
Gajewski and Ginglinger (2002)	215	1986-96	France	-0.80%
Cronqvist and Nilsson (2005)	199	1986-99	Sweden	5.43%[d]
Wu, Wang, and Yao (2005)	405	1989-97	Hong Kong	1.94%[d]
Quynh-Nhu (2009)	82	1996-03	Finland	-3.60 %

[a] abnormal return for industrial firms only, [b] equally weighted average between hot and cold markets,
[c] sample containing only standby rights offerings, [d] equally weighted average between all issue types

Table I above pools together the research on SEO announcement returns conducted using US, UK and international data respectively. The international evidence on SEOs remained fairly narrow for a long time, but has broadened recently. Eckbo et al. (2007) state that there are significant country-specific institutional differences, and as opposed to the common practice in the US, the rights issues have remained the most often used transaction type in the smaller economies. In many of the smaller countries, the reported announcement returns have been

neutral or slightly positive on average. However, the floatation method choice plays a significant role in explaining the announcement returns of the issuers. In the UK, Slovin et al. (2000) investigate a small sample (20) of uninsured rights offerings and find significantly negative announcement return. They also report negative announcement effect for standby rights offerings and positive for private placements respectively.[4] Barnes and Walker (2006) divide the UK SEOs into rights offerings and placings and analyze the impact of issue method on announcement effect. Their findings indicate that while rights offerings face slightly negative announcement effect, placings experience positive, but statistically insignificant market reaction. Moreover, the positive returns around the announcement of private placements have been verified also in the US market as Eckbo et al. (2007) summarize the existing literature on private placements and conclude that various authors report positive returns. Burton, Lonie and Power (2000) and Burton, Helliar and Power (2003) find that the negative announcement returns in the UK are driven by rights issues, while public offerings face neutral market reaction during the announcement window.

2.3.2 Long-term underperformance

Most of the studies on SEOs' stock market dynamics report positive stock market run-up before the issue. While the positive pre-issue stock market performance has been known and accepted for long a period of time, it was not until mid-1990s when Loughran and Ritter (1995) present post-issue underperformance of seasoned equity issues. A typical SEO firm during the period 1970-90 provides only an average annual return of 7 % over the five years subsequent to the issue. Loughran and Ritter's (1995) findings are economically significant as an investor should have invested 44 % more capital to issuers as opposed to non-issuers to achieve the same return. Similarly to Loughran and Ritter, Spiess and Afflec-Graves (1995) examine the post-issue performance of firms filing an SEO, and find robust underperformance of SEOs firms after controlling for size, book-to-market and company age. They also suggest two distinct explanations for the observed results: First, the significant underperformance in the long-term could be a result of successful market timing by the management. Second, the underperformance can stem from the decrease in firms' risk and simply not be anomalous at all as firms with lower risk are expected to yield lower returns. The findings of Loughran and

[4]Uninsured rights offering refers to an equity issue where the existing shareholders are offered a preference over the new investors. In a standby rights offering a financial advisor, typically an investment bank, guarantees the risk of being able to sell all the issued shares to the market. Private placement as opposed to public offering refers to an equity issue in which certain investor or a group of investors subscribes all the issued shares and no shares are being offered to the public.

Ritter (1995) and Spiess and Afflec-Graves (1995) are striking in the sense that they challenge efficient market hypothesis and motivates the development of behavioral asset pricing models. Finally, the existing literature on the UK post-issue stock market performance reports an average annual underperformance of approximately 5 %, which is well in line with the evidence from the US.

Numerous researches have criticized the findings and questioned their robustness. After the "new issues puzzle", the underperformance of equity issuers following an issue, was presented, a number of authors have questioned the robustness of the phenomenon. Mitchell and Stafford (2000) and Brav, Greczy, and Gombers (2000) state that the underperformance of new issues stems from model misspecification, and is attributable to the wrong benchmarks used. Eckbo, Masulis and Norli (2000) are of the same opinion and explain that when firms issue equity, they lower the company specific default risk and therefore, should provide a lower return on equity. In addition, they suggest that as an SEO significantly increases the liquidity of the stock, it further lowers the issuer's expected return and consequnetly, the matching firm or portfolio becomes less suitable for comparing the post-issue returns. Eckbo et al. (2000) conclude that the new issues puzzle is a result of matching firm technique's inability to adjust for company specific risk. Fama (1998) questions the long-term post-issue underperformance and suggests that long-term anomalies are extremely sensitive to the selected methodology. Moreover, the assumptions on normal returns and statistical approaches on measuring them can be responsible for the anomaly. Fama (1998) assumes the high returns prior to the issue to reflect high earnings and he explains that if investors do not fully understand that earnings will mean-revert in the long-run, the investors only gradually react in the long-run, and consequently the firm underperforms following an SEO. Finally, Fama (1998) concludes that if an anomaly disappears when different methodology is used to detect it, and all studies replicate the robustness tests employed by the first studies in the subject, the anomaly as such can be an illusion.

Table II
Literature on SEO post-issue underperformance using BHAR methodology

The table summarizes the main findings in the area of SEO post-issue underperformance. Two of the most often used methodologies for detecting abnormal returns in the long-term event studies are buy-and-hold abnormal returns (BHAR) and calendar-time portfolio abnormal returns using either Fama-French three-factor model or some of the applied versions of factor models. The table pools together only the studies that measure the abnormal returns using BHAR methodology and employing either matching firm or portfolio as the benchmark for normal returns. The first studies on topic were published in 1995 and the SEO post-issue underperformance continues to be a widely examined topic in the corporate finance literature.

Author(s)	Sample size	Sample period	Market	Holding period	BHAR
Loughran and Ritter (1995)	3,702	1970-90	US	36 months	-33.0%
Loughran and Ritter (1995)	3,702	1970-90	US	60 months	-59.4%
Spiess and Affleck-Graves (1995)	1,247	1975-89	US	36 months	-22.8%
Jegadeesh (2000)	2,992	1970-93	US	60 months	-34.3%
Brav, Geczy and Gombers (2000)	3,775	1975-92	US	60 months	-26.3%
Eckbo, Masulis and Norli (2000)	3,851	1964-95	US	60 months	-23.2%
Eckbo, Masulis and Norli (2007)	4,971	1980-00	US	60 months	-29.7%[a]
Eckbo, Masulis and Norli (2007)	655	1980-00	US	60 months	0.0%[b]
Eckbo, Masulis and Norli (2007)	659	1980-00	US	60 months	-19.1%[c]
Suzuki (2000)	826	1991-96	UK	18 months	-15.1%
Ho (2005)	627	1989-97	UK	36 months	-19.5%
Ngatuni, Capstaff and Marshall (2007)	818	1986-95	UK	60 months	-32.1%
Andrikopoulos (2009)	1,542	1988-98	UK	36 months	-26.2%
Cai and Loughran (1998)	1,389	1971-92	Japan	60 months	-41.7%
Jeanneret (2005)	336	1982-97	France	36 months	-44.4%[d]
Jeanneret (2005)	43	1982-97	France	36 monhts	-17.2%[e]

[a] abnormal return for industrial firms only, [b] abnormal return for financial firms only,
[c] abnormal return for utilities firms only, [d] rights offerings, [e] public offerings

Despite the criticisms, a large number authors report statistically significant long-term underperformance. Table II above presents the most influential findings in the area of seasoned equity issuers' post-issue underperformance. Results are somewhat sensitive to the model specification, two of the most often employed being buy-and-hold abnormal returns and calendar-time abnormal returns. In different studies, the abnormal underperformance has varied between 0 % and 60 % over the estimation period, while the typical annual underperformance has settled between 5 % and 10 %. Yet, the low stock market performance of equity issuing firms seems to remain an unsettled issue in the corporate finance literature.

Besides market timing theory of equity issuance, the deterioration in SEO firms' post-issue performance is able explain why issuers on average underperform to their non-issuing benchmarks. One such theory, consistent with information asymmetry arguments on equity

issuance, is the deterioration of operative performance following an issue. Accordingly, managers can manipulate firm accounting information leading into a bias in investors' expectations on the firm prospects. The weakening of operating performance over long-horizon after the SEOs gradually narrows information asymmetry between managers and investors resulting into a revision of valuations and post-issue underperformance. Loughran and Ritter (1997) find that firms' operative performance improves sharply before an SEO and causes a run-up in the stock price. However, the operative performance of the issuers starts to deteriorate soon after the issue and results in poor long-term stock returns. Andrikopoulos (2009) studies the determinants of long-term underperformance using a sample of UK equity issuers. He uses various indicators of operating performance, for instance return on assets (ROA) and net profit margin, and concludes that firms' performance sharply declines immediately after the SEO and continues to deteriorate for up to three years following an SEO.

Due to the partial inability of some of the existing theories to explain the stock price mechanism around the SEOs, Carlson, Fischer, and Giammarino (2006) present a theory utilizing real-option framework. According to Carlson et al. (2005, 2006), firms issue equity when they grow in size and end up using the proceeds to convert real-options into assets in place. Even if the assets are risky in general, they are less risky than the real options held by the firms, and the reduced risk explains long-term underperformance documented by Loughran and Ritter (1995) and others. The real-option framework by Carlson et al. (2006) actually comes close to the arguments of Eckbo et al. (2000), according to which equity issues generally decrease firm default risk. Namely, the common factor explaining the poor long-term performance in both cases is the reduction in risk due to capital flow in fixed assets. The theory of Carlson et al. (2005, 2006) can explain also pre-issue stock price run-up, as firms only convert options into assets when the options move significantly in the money. The stock price run-up thus is a result of firm's real-options moving from out of the money to in the money. The theory assumes that the projects become as real-options, since they are flexible in time and additionally, managers can delay and time the projects for the periods when they yield the highest possible return. Interestingly, while market timing theory assumes managers' ability to time the market to lead into low post-issue returns, the real-option theory presented by Carlsson et al. (2006) assumes that lower future returns stem from lower risk after SEO proceeds are converted from real-options into assets.

Besides the real-option framework, by Carlson et al. (2006), a few other studies point out the importance of investment opportunities in explaining the post-issue performance. Autore, Bray and Peterson (2009) analyze the role of use of proceeds in SEO returns and report results that indicate investment purposes to be the only category with insignificant abnormal underperformance. Moreover, emplying BHAR and factor-models, they conclude that all the other use of proceed classes significantly underperform in the long-term. Lyandres, Sun and Zhang (2008) study post-issue returns and agree that the presence of investment opportunities actually explains the majority of the abnormal stock price performance.

Schulz (2003) presents an alternative theory, pseudo market timing, to explain poor long-term stock performance following an SEO. He argues that most of the SEOs occur after stock market has been bullish in general, since issues often take place during the hot cycles, which occur when the stock market is at a high level. After the stock price run-ups, the future returns are likely to be lower. Therefore, majority of the seasoned equity offerings are likely to perform poorly and the managements' market timing does not account for the phenomenon. Schulz (2003) suggests that calendar-time portfolio approach to eliminate the impact of time and fluctuating stock market, which however, is not problem-free according to Jegadeesh (2000).

3 HYPOTHESES

This section will present the hypotheses that are tested in the study. The hypotheses are mainly based on the existing literature presented in Chapter 2. I will first motivate and posit the hypotheses on the macro determinants of equity issues. Secondly, I will posit the hypotheses on the micro level determinants of SEOs, put differently the factors that can explain why some firms choose to issue equity and others debt. Finally, I pose hypotheses on the abnormal returns during the announcement period and in the post-issue period. All the hypotheses are pooled into a table III at the end of the chapter.

3.1 Macro level determinants of SEOs

The various hypotheses for equity issue determinants presented in the literature are partly overlapping. Namely, firms tend to issue equity when stock prices are high, which is also likely to occur simultaneously with rising economic activity and profitable invest

opportunities. Furthermore, at those time periods, information asymmetry can be fairly low as investors know that the management faces promising investment opportunities. Investor sentiment can also be inflated by the recent stock market run-up. Despite the partial overlap in different equity issue determinant theories, I test the following hypotheses separately making an effort to pick well specified proxies.

Vast majority of the studies on SEOs document that equity issues are likely to occur at times of high market valuation levels. In addition, Graham and Harvey (2001) survey CEOs motivations for SEOs and find that market timing is one of the key reasons for firms to conduct an SEO. Baker and Wurgler (2002) hypothesize that firms issue equity to time the market and utilize irrational investors' inability to adjust their valuations following a stock market run-up. Following prior literature, I choose aggregate median market-to-book of all listed UK firms and 12-month past raw stock market return on FTSE All-Share index as the macro level market timing proxies. On the contrary, as Baker and Wurgler (2000) state that high SEO volume periods tend to occur just before stock market crashes, I include future 12-month raw return on stock market index as an additional market timing proxy.

H_1. *Macro volume of SEOs increases with market timing.*

Following Lowry (2003), I hypothesize that adverse selection cost of issuing equity fluctuates over time. Moreover, information asymmetry between managers and the equityholders of the firm forces managers to issue equity when the adverse selection costs are minimized and management's and investors' opinions aligned. Myers (1977) and Myers and Majluf (1984) show that adverse selection forces firms to reject positive NPV projects, if financing cannot be arranged at favorable terms. Bayless and Chaplinsky (1996) and Dierkens (1991) find that equity issues tend to cluster in periods with smaller average announcement effects. Furthermore, those periods are negatively correlated with the measures of information asymmetry. According to Dittmar and Thakor (2007), management wishes to issue equity if investors' perceptions on the upcoming investment projects are aligned with the management. In other words, management wants the information asymmetry to be minimized before committing an SEO. I choose the aggregated standard deviation of analysts' recommendations on the FTSE 100 constituents and daily market volatility within a quarter as the macro level information asymmetry proxies. Furthermore, when analysts' opinions on the firm value are

aligned and stock market index is behaving steadily, I hypothesize more firms to conduct an SEO.

H_2. *Macro volume of SEOs decreases with asymmetric information.*

Firms face higher demand for capital, when they have promising investment projects available. In general, upward business cycles tend to provide firms with better investment opportunities. Choe et al. (1993) investigate the impact of the business cycles on firms' decision to issue equity. They find firms' demand for capital to be highest at times of favorable economic conditions – firms are likely to have promising positive NPV investment projects when the economy is booming and investors are willing to invest new equity in the firms. Following Lowry (2003), I choose GDP growth, average sales growth among all the public firms and average interest rate within a quarter as the macro level demand for capital proxies. GDP growth measures the aggregate state of the economy, while firms' sales growth should theoretically be followed by higher need for investment to support the growth. Finally, investment projects' NPVs are likely to be positive when discount rates are low.

H_3. *Macro volume of SEOs increases with demand for capital.*

Lowry (2003) finds investor sentiment to be a strong determinant of the IPO volume. In addition, she states that during some periods, investors are overly optimistic and willing to pay more for firms than they are actually worth. As SEOs are clustered for high volume cycles, I hypothesize that investor sentiment is also a determinant of the SEO volume. Qiu and Welch (2005) discuss the strengths of various investor sentiment proxies and conclude that consumer confidence correlates strongly with actual investor sentiment and has additional theoretically sound characters, such as the ability to explain small-firm return spread and closed-end-fund IPO activity. Therefore, I choose consumer sentiment index as the investor sentiment proxy at the macro level.

H_4. *Macro volume of SEOs increases with investor sentiment.*

3.2 Micro level determinants of SEOs

In the micro level determinant hypotheses, I refer solely to the firm specific characteristics to distinct between equity issue type firms and debt issue type firms. Similarly to macro determinant level, I hypothesize that equity issuers at micro level, are motivated by market timing to issue equity. I test whether the equity issuers have experienced higher 12-month raw

stock returns, have higher market-to-book ratios and have lower future 12-month raw stock returns in comparison to debt issuers.

H_5. *The likelihood of an SEO relative to a debt issue increases with market timing.*

As already pointed out, pecking order considerations and time-varying adverse selection costs suggest that the equity issuing firms are not suffering severely from information asymmetry. I assume that the firms who are followed by analysts can communicate their intrinsic value to investors more accurately. Therefore I hypothesize that firms followed by the analysts are more likely to choose equity financing over debt than companies not followed by analysts. In addition, Dittmar and Thakor (2007) point out that low leverage firms are likely to have strong growth opportunities and suffer from asymmetric information. Therefore, I hypothesize that firm's leverage is negatively associated with information asymmetry and positively associated with the likelihood of an equity issue.

H_6. *The likelihood of an SEO relative to a debt issue decreases with asymmetric information.*

Building on the framework discussed by Myers (1977) and Rajan and Zingales (1995) in their recent paper, Dittmar and Thakor (2007) note that firms of higher growth opportunities have higher agency costs of debt. Therefore, the firms with high demand for capital resulting from growth opportunities can prefer issuing equity over debt. I choose sales growth during the year of the issue and the level of capital expenditures during the year of the issue divided by total assets at the end of previous year as the proxies of firm-specific demand for capital. Finally, the third micro level demand for capital proxy is the reporting of research and development expenditures during the previous year.

H_7. *The likelihood of an SEO relative to a debt issue increases with demand for capital.*

3.3 Issuer stock market performance

The empirical evidence on SEO announcement effect typically reports a negative stock market reaction, but further evidence exists to explain the determinants of announcement effect. Bayles and Chaplinsky (1996) find that equity issues at times of high SEO volume experience less negative announcement returns than issues during low SEO volume periods. However, the less negative market reaction during periods of high SEO volume could be a consequence of market timing, information asymmetry, demand for capital or investor sentiment. To test the impact of SEO volume, I choose the macro level SEO volume in the

issue quarter as the volume proxy to detect whether firms issuing during hot periods undergo less negative announcement effect than firms issuing during cold periods.

H_8. *SEO announcement return increases with SEO volume.*

Choe et al. (1993) discuss the possibility that the stock market reacts less negatively to SEOs during periods of better investment opportunities due to higher demand for capital and lower information asymmetry. At the cross-sectional level, Denis (1994) and Burton et al. (2000) find some evidence of positive impact of sales growth and other capital demand proxies on SEO announcement return. To test the impact of demand for capital on announcement effect, I choose firm's sales growth during the year of the issue as the proxy.

H_9. *SEO announcement return increases with demand for capital.*

If firms issue equity to time the market and purely exploit stock price rising above its intrinsic value, investors should react to the issue announcement more negatively and adjust their valuations toward lower levels. However, agency models predict that companies having high past stock returns are likely to face promising future outlook and positive NPV investment opportunities. In the described circumstances, equity issues are anticipated and the stock price reactions should not reflect negative adverse selection costs, whereas in the case of unanticipated equity issues both pecking order and agency models predict that the equityholders would be better off if the firm did nothing or issued debt. I test the impact of market timing on announcement return using both firm's past 12-month stock return and the level of market-to-book ratio to distinct between firms of high and low market timing.

H_{10}. *SEO announcement return increases with market timing.*

Earlier literature reports statistically and economically significant long-term underperformance following an equity issue (see, e.g., Loughran and Ritter (1995), Jegadeesh (2000)). Numerous authors explain that long-term underperformance stems from the opportunistic activity of managers to time the equity market or alternatively, from deterioration of firm's operative performance. Should the company issue equity due to attractive market timing, the post-issue long-term return should be lower than in the case of an investment driven SEO. Namely, an investment project as the use of proceeds could alleviate the problem of market timing and ensure the funds are put into effective use. Therefore I posit the following two mutually non-exclusive hypotheses:

H_{11}. *SEO long-term underperformance increases with market timing.*

H_{12}. *SEO long-term underperformance decreases with demand for capital.*

The presence of market timing attempt suggests that SEOs underperform in general. In the case of a larger issue, the underperformance should be higher. More specifically, the firms who seek to issue a larger amount of cash than they are able to efficiently spend exploit themselves for post-issue underperformance and show signs of managerial hubris. Therefore, I hypothesize that larger issues are worse investments than smaller issues in the longer term.

H_{13}. *SEO long-term underperformance increases with deal size.*

Table III
Summary of hypotheses

Macro determinants of SEOs	
H_1	Macro volume of SEOs increases with market timing.
H_2	Macro volume of SEOs decreases with asymmetric information.
H_3	Macro volume of SEOs increases with demand for capital.
H_4	Macro volume of SEOs increases with investor sentiment.
Micro determinants of equity issue vs. debt issue choice	
H_5	The likelihood of an SEO relative to a debt issue increases with market timing.
H_6	The likelihood of an SEO relative to a debt issue decreases with asymmetric information.
H_7	The likelihood of an SEO relative to a debt issue increases with demand for capital.
Issuer stock market performance	
Announcement return	
H_8	SEO announcement return increases with SEO volume.
H_9	SEO announcement return increases with demand for capital.
H_{10}	SEO announcement return increases with market timing.
Long-term underperformance	
H_{11}	SEO long-term underperformance increases with market timing.
H_{12}	SEO long-term underperformance decreases with demand for capital.
H_{13}	SEO long-term underperformance increases with deal size.

4 DATA

This section introduces the data collection process and outlines the final samples. In this thesis I investigate the determinants of SEOs from both macro and micro perspectives and the

performance of SEO firms. As the tests pose distinct requirements for the data, I retrieve data for all the three purposes separately and present the sample collection processes and final samples accordingly.

4.1 The sample collection process

4.1.1 Macro level determinants of seasoned equity offerings

The sample employed in the tests of aggregate issue volume is gathered in the following manner. First, I search for seasoned equity offerings by UK firms listed in the London Stock Exchange (LSE) that took place between Q1 1994 and Q3 2008 from Dealogic database[5]. I further require the deal value to be greater or equal to €5 million to get rid of economically insignificant issues and additionally, I require the issue to be a follow-on issue to exclude IPOs and convertible issues which are not part of the study. In addition, following Lowry (2003), I exclude issues by closed-end-funds, ADRs and REITs. The approach yields total of 2,670 SEOs taking place during 59 quarters. Secondly, I collect quarterly accounting data from Thomson's Worldscope and data on analyst recommendations from Thomson's I/B/E/S history database. Finally, I retrieve data on the relevant economic fundamentals and stock market variables from Datastream. All the stock data employed in the tests of the thesis are dividend and stock split adjusted total return index data, and the stock returns are calculated as logarithm returns.

4.1.2 Micro level determinants of seasoned equity offerings

To examine the likelihood of certain firm characteristics leading into an increased probability of an SEO, I collect cross-sectional data on equity issuers and debt issuers. I begin the data collection process by retrieving a list of seasoned equity offerings by UK firms listed in the LSE between Q1 1999 and Q3 2007 from Dealogic again requiring that the issue is of a size greater than €5 million, the issue to be a follow-on offering, and exclude issues by closed-end-funds, ADRs and REITs.[6] The search yields 1,740 SEOs out of which 1,725 contain an ISIN-code. I further exclude issues with only secondary shares sold (494) and firms with no stock data available (357). Finally, I restrict firms with no sufficient accounting data available (451). I collect data on the control group, the debt issuers, following the procedure used by

[5] The main advantage of using Dealogic instead of Thomson SDC database or Thomson Deals database is that Dealogic reports the announcement dates for equity issues, while the two other sources report only issue dates and filing dates.

[6] The beginning of the sample period is limited until 1999, as in prior years the required identification criterion, the ISIN-code, is not provided. Correspondingly, I examine the companies' performance in the long-term and require that a minimum of 24-months of stock data exists after the issue.

Hovakimian et al. (2001). Further, a company year is classified as debt issuing year if the increase in total debt between the beginning and end of the year is at least 10 % of the total assets in the beginning of year. I search accounting data and stock data for all the sample observations, and additionally for all the firms listed in the LSE during the corresponding sample period, to also compare equity issuers to non-issuers.[7] I collect annual historical accounting data from Thomson's Worldscope and the total return index stock data from Datastream. After excluding observations with no sufficient data available I'm left with a final sample of 423 firm years with an SEO and 1,096 firm years with a debt issue.

4.1.3 Abnormal returns of SEO firms

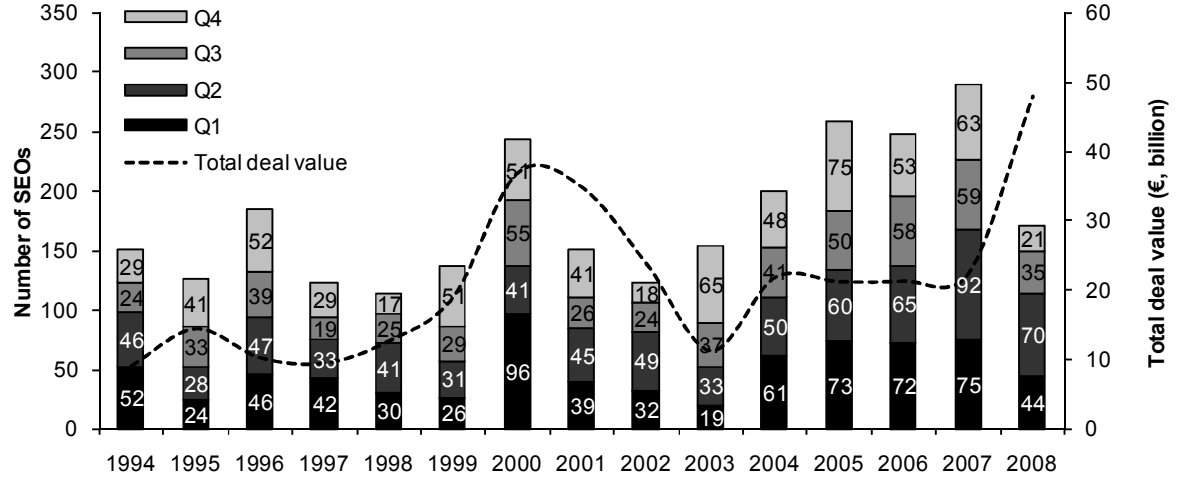
To measure the stock market performance of SEO firms around the announcement and in the long-term following an issue, I use the same sample of issues as gathered in the previous subsection with the exception that the requirements on the data availability are slightly loosened and as a result, the event sample consists of 543 SEOs. The sample consists of 289 SEOs by firms listed in the main-list and 254 SEOs by firms listed in the AIM-list of the London Stock Exchange. The required stock data for benchmarking the returns of issuers against the value weighted FTSE All-Share market index and matching firms are retrieved from Datastream. I assign the matching firms for event firms using the following three-step procedure: First, I define all the UK listed firms at the beginning of a given event year that did not conduct an SEO during the year. Second, among the chosen firms, I choose all the firms having market capitalization between 70 % and 130 % of the event firm's market capitalization as the potential matches. Third, out of the potential matches, I define the firm having the most similar market-to-book in comparison to the event firm as the matching firm. Finally, I do not require the issuers to remain listed throughout the sample period to avoid survival bias.

4.2 Sample characteristics

In this subsection, I present some of the most relevant properties of the data sample retrieved as the outcome of the data collection process explained in the previous subsection. Moreover, I plot the time series fluctuation of SEO volume and show the number and value of deals qualified in the final sample.

[7] The sample collection process of non-issuer sample is presented in Appendix 1.

Panel A. Quarterly number of SEOs and annual total deal value



Panel B. Quarterly number of SEOs and scaled volume (SEO%)

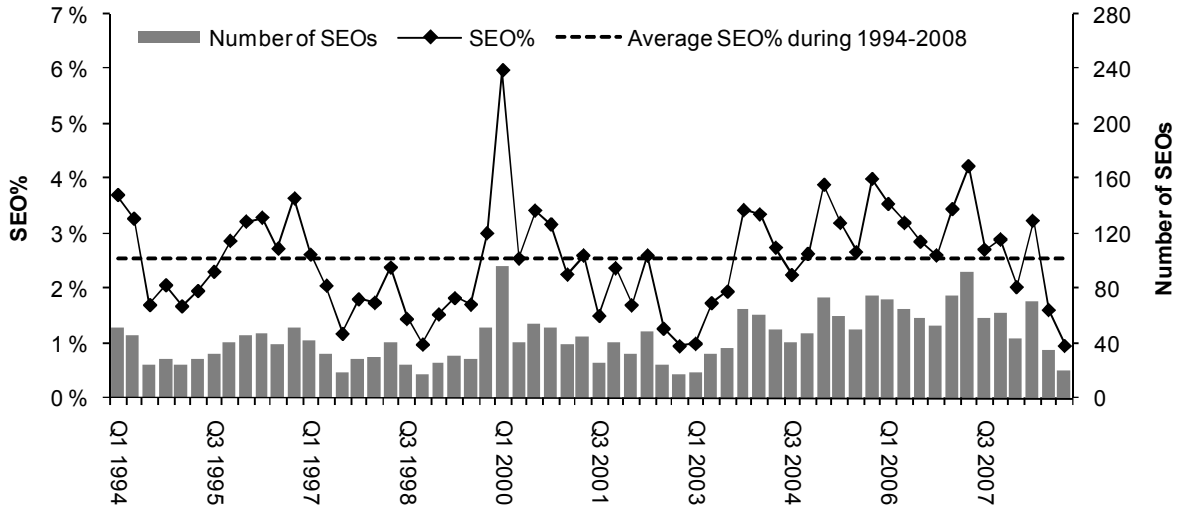


Figure 1: SEO volume and value in the UK 1994 – 2008
Panel A) The figure shows the quarterly distribution of UK SEOs during 1994-2008. The bars plot the number of SEOs in the quarter, while the dotted line shows the annual aggregate deal value in €, billion. The data are sourced from Dealogic database and includes all the SEOs by UK companies with total deal value exceeding €5 million. **Panel B)** The grey bars plot the quarterly number of SEOs and the black line shows the number of SEOs divided by the number of UK listed firms in the LSE at the end of the previous year (SEO%). The dotted line shows the average SEO% during the 1994-2008 period.

The properties of the sample employed in the analysis of the economy-wide determinants of SEO volume is presented in Figure 1, which shows that equity issuance volume fluctuates both annually and quarterly. The Panel A shows that both volume and value of SEOs possibly have upward trend during the 15-year time period and suggests that equity issue market activity has increased over time. Furthermore, to mitigate the problem of non-stationarity, I

follow similar procedure to Lowry (2003) and divide the volume of SEOs in a quarter by the number of listed firms at the end of the previous year to gain market activity adjusted SEO% figure. The Panel B shows that Q1 2000 is an outlier observation – I run regressions also excluding it to account for the possible impact that an outlier could have in estimation of the hypothesized relations.

Table IV
Sample characteristics: macro & micro determinants and issuer stock market performance

Panel A) The table shows the annual deal volume and value (mean) during the period under review 1994-2008 of the macro determinants sample sourced from Dealogic. The sample consists a total of 2,670 UK SEOs with deal value exceeding €5 million. **Panel B)** The table shows the annual deal volume, value (median) and deal size (as a percentage of the previous year end market cap) of equity issues and debt issues of the micro level determinants sample. The equity issues are sourced from Dealogic and consist of all UK SEOs with deal value exceeding €5 million during period 1999-2007. After retrieving financial data from Thomson's Worldscope and stock data from Datastream, I exclude all the SEOs with missing key data items and come up with a final sample of 423 firm years with an equity issue. The debt issues are sourced from Thomson and consist of all UK issues during period 1999-2007, in which a firm issues more than 10 % of debt relative to total assets at the end of the previous year. After retrieving financial data from Thomson's Worldscope and stock data from Datastream, I exclude all the debt issues with missing key data items and come up with a sample of 1,096 firm years with a debt issue. **Panel C)** The table shows mean and median deal values and relative deal sizes of the issuer stock market performance sample. The equity issues are sourced from Dealogic in a similar manner to the data in Panel B) with the exception that more equity issues (543) are qualified to the final sample due to looser requirements on the data availability.

Sample characteristics

Panel A: Macro-level determinants sample

Year	N	Deal value (Mean)	Cont'd Year	N	Deal value (Mean)
1994	151	59.8	2002	123	193.1
1995	126	114.0	2003	154	72.7
1996	184	55.4	2004	200	108.9
1997	123	76.4	2005	258	82.0
1998	113	111.4	2006	248	85.7
1999	137	138.4	2007	289	77.2
2000	243	151.5	2008	170	281.6
2001	151	230.2			
			Total	2,670	118.1

Sample characteristics (continued)

Panel B: Micro-level determinants sample

	Equity issues			Debt issues		
Year	N	Deal value (Median)	Deal size (Median)	N	Deal value (Median)	Deal size (Median)
1999	18	64.2	18 %	125	40.0	16 %
2000	34	48.1	12 %	150	39.1	19 %
2001	29	33.6	20 %	117	21.7	25 %
2002	25	60.2	25 %	64	16.7	20 %
2003	32	20.7	20 %	50	28.4	25 %
2004	59	15.3	17 %	75	24.1	17 %
2005	64	29.1	10 %	136	36.9	20 %
2006	74	18.9	9 %	162	26.0	19 %
2007	88	20.7	12 %	217	28.3	16 %
Total	423	24.0	13 %	1,096	30.8	19 %

Panel C: Issuer stock market performance sample

	Deal value (€ million)			Deal size (% of Mcap)	
Year	N	Mean	Median	Mean	Median
1999	26	66.9	22.0	58 %	32 %
2000	37	231.8	47.1	19 %	11 %
2001	34	158.6	30.3	44 %	23 %
2002	37	208.0	31.5	44 %	28 %
2003	48	77.7	19.3	56 %	33 %
2004	72	132.6	14.3	51 %	24 %
2005	79	74.6	25.8	37 %	18 %
2006	93	94.1	26.0	48 %	24 %
2007	117	59.5	17.1	38 %	24 %
Total	543	107.3	22.0	43 %	24 %

The three separate samples collected for the purposes of the thesis are presented in the Table IV. The number of issues in macro determinant sample (2,670) is clearly larger than in micro determinant (423) and issuer stock market performance sample (543), since for the purposes of macro level analysis, I do not need to collect issuer specific data. Moreover, the issuer specific data requirements in cross-sectional samples force to exclude a number of observations, and to truncate the period by five years due to missing identification criteria.

Panel A in Table IV shows that the year 2007 is the peak year in equity issuance with 289 SEOs in total, but the mean deal value is only € 77.2 million. Similarly in most of the years of high deal volume, the mean deal value appears to be lower than in years of lower deal value.

A possible explanation is that the hot seasoned equity market enables also smaller firms to issue equity, while larger firms are less sensitive to the equity market conditions. Panel B in Table IV shows that the sample of equity issues and debt issues are fairly similar to each others in deal values and relative deal sizes. Panel C in Table IV shows that mean deal value clearly exceeds the median deal value in each of the sample years. The relationship holds also when comparing the relative deal sizes. Moreover, mean values are lifted by a small number of extremely large issues, while majority of the SEOs tend to be smaller in size.

Table V
Descriptive statistics of macro determinants sample

The table presents the descriptive statistics of macro determinants sample. SEO%, the dependent variable, is the total number of UK SEOs in a given quarter divided by the number of listed firms at the end of the previous year. Stdev $Mret_{[0]}$ is the daily standard deviation of FTSE All-Share index within a quarter. Analyst $dispersion_{[-1]}$ is the weighted average standard deviation of analyst recommendations on FTSE 100 index firms at the end of the preceding quarter, where the weights are number of analysts following a firm. GDP $growth_{[-1,+2]}$ is the UK GDP growth from 1 quarter before to 2 quarters after the given quarter. Sales $growth_{[+1,+4]}$ is the average sales growth of all UK listed firms from 1 quarter to 4 quarters following the given quarter. Interest $rate_{[-4,-1]}$ is the average LIBOR rate from 4 quarters prior to 1 quarter prior to the given quarter. SENT $index_{[0]}$ is the level of UK consumer sentiment in the quarter. $M/B_{[0]}$ is the median market-to-book of all UK listed firms. $Mret_{[-4,-1]}$ is the return on FTSE All-Share index from four quarters to one quarter prior to the given quarter. $Mret_{[+1,+4]}$ is the return on FTSE All-Share index from one quarter to four quarters following the given quarter. The sample consists of 59 quarterly observations from Q1 1994 to Q3 2008. Number of SEOs is sourced from Dealogic, financial data from Thomson's Worldscope, data on analyst recommendations from Thomson's I/B/E/S history and stock data and economic variables from Datastream. Skewness measures the shape of variable's distribution and Kurtosis indicates whether larger than normal proportion of variable's variance stems from extreme observations. Jarque-Bera addresses whether the variable is from a normal distribution based on the values of Skewness and Kurtosis.

	Mean	Median	Max	Min	Stdev	Skew-ness	Kurtosis	Jarque-Bera	Prob.	n
SEO%	0.026	0.026	0.060	0.010	0.009	0.709	4.411	9.838	0.007	59[a]
Information asymmetry										
Stdev $Mret_{[0]}$	0.009	0.008	0.024	0.004	0.004	1.302	4.572	22.739	0.000	59
Analyst $dispersion_{[-1]}$	0.769	0.803	0.954	0.523	0.100	-0.553	2.753	3.211	0.201	59
Investment opportunities										
GDP $growth_{[-1,+2]}$	0.027	0.028	0.048	-0.049	0.014	-3.143	17.099	585.80	0.000	59
Sales $growth_{[+1,+4]}$	0.076	0.107	0.272	-0.143	0.093	-0.338	2.466	1.821	0.402	59
Interest $rate_{[-4,-1]}$	0.055	0.057	0.075	0.037	0.010	-0.088	2.196	1.667	0.435	59
Investor sentiment										
SENT $index_{[0]}$	-5.220	-4.230	4.700	-24.900	5.685	-1.096	4.925	20.930	0.000	59
Market timing										
$M/B_{[0]}$	1.816	1.942	2.812	0.890	0.461	-0.184	2.236	1.768	0.413	59
$Mret_{[-4,-1]}$	0.101	0.152	0.401	-0.286	0.156	-0.658	2.616	4.624	0.099	59
$Mret_{[+1,+4]}$	0.078	0.138	0.401	-0.305	0.177	-0.634	2.342	5.018	0.081	59

[a] The removal of the single outlier observation at Q1 2000 eliminates the problem of increased Kurtosis and guarantees that OLS requirements will be fulfilled

Table V above presents the descriptive statistics of the macro level determinant sample. The proxy variables are classified into four different categories. Further, the power of each category in explaining the SEO volume fluctuation at the macro level is tested in the thesis. The distribution of the dependent variable, SEO%, does not seem to suffer from Skewness, yet Kurtosis suggests the sample may not be normally distributed. As a further measure of robustness, I investigate the time series properties of SEO% without the outlier observation at Q1 2000 and conclude that OLS requirements are fulfilled, due to the decrease in Kurtosis back to acceptable levels.

Table VI
Firm characteristic of micro determinants sample

The table presents the sample firm characteristics of equity issuers and debt issuers employed in the tests of micro determinants. Equity issues are sourced from Dealogic and debt issues from Thomson. The firm financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 423 firm years with an equity issue and 1 097 firm years with a debt issue. ANA is analyst following dummy variable that gets value of 1 if the firm is followed by one or more analysts and value of 0 if the firm is not followed by analysts. Slack is the cash and cash equivalents divided by total assets at the previous year end. LEV is a measure of firm leverage and is calculated as total interest-bearing debt divided by total assets at the previous year end. GRO is the sales growth during the issue year. INV is a measure investment calculated as capital expenditures during previous year divided by total assets at the previous year end. M / B is market cap divided by total common equity at the previous year end. Stock PRE is the 12-month raw stock return before the issue. Stock POST is the 12-month stock return following an issue. VOL is the daily volatility of the firm's stock returns from 250 trading days before the issue to 50 trading days before the issue. ROA is earnings before interest, taxes and depreciation divided by previous year end total assets. DIV is a dividend dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. SIZE is the natural logarithm of previous year total sales. TNG denotes to tangibility of assets and is calculated as property, plant and equipment divided by total assets at the previous year end. The last column reports *t*-statistics of equal means between equity issuers and debt issuers, where * and ** denote to statistical significance of difference in means at 5 % and 1 % levels respectively.

	Equity issuers (n=423)		**Debt issuers (n=1,097)**			
	Mean	Median	Mean	Median	Difference	*t*-stat
ANA	0.745	1.000	0.718	1.000	0.026	1.05
Slack	0.134	0.064	0.100	0.054	0.034	3.98**
LEV	0.222	0.199	0.220	0.182	0.002	0.16
GRO	0.527	0.189	0.297	0.137	0.231	3.81**
INV	0.064	0.034	0.067	0.038	-0.004	-0.72
M / B	2.153	1.183	1.459	0.985	0.694	4.49**
Stock PRE	0.288	0.327	0.087	0.138	0.201	5.95**
Stock POST	-0.201	0.019	-0.140	-0.012	-0.061	-1.43
VOL	0.024	0.020	0.021	0.017	0.003	4.02**
ROA	0.075	0.085	0.110	0.114	-0.035	-4.59**
DIV	0.362	0.000	0.536	1.000	-0.175	-6.28**
R&D	0.312	0.000	0.198	0.000	0.114	4.46**
SIZE	11.538	11.278	11.665	11.502	-0.127	-1.10
TNG	0.275	0.166	0.318	0.224	-0.043	-2.64**

The sample characteristics of equity issuers and the control group, the debt issuers, employed in the analysis of SEO micro determinants are presented in Table VI. The equity and debt issuers appear to have several distinct characteristics. Moreover, equity issuers have higher stock return volatility, more financial slack, higher market-to-book and experience higher stock returns before the issue. On the other hand, equity issuers have lower tangibility of assets, lower dividend payout ratio and suffer from lower return on assets. The issuer stock market performance sample characteristics are strongly similar to equity issuers' sample shown in Table VI, because both samples are derived in the same manner from the same sources. Therefore, the sample characteristics of issuer stock market performance tests are not reported separately. The correlation coefficients between variables used in macro determinant analyses and micro determinant analyses are shown in the Appendices 2 and 3 respectively. Macro determinant sample and issuer stock market performance samples by industries are shown in the Appendix 4. Finally, a list of specific data items used in the tests are shown in the Appendix 5.

5 METHODOLOGY

5.1 Determinants of seasoned equity offerings

5.1.1 OLS regression

The macro level determinants of the SEO volume and the determinants of the abnormal returns, both around the announcement and in the long-term, are estimated by means of cross-sectional ordinary least squares (OLS) regression. According to Dougherty (2002, p.114-118) OLS regression with variable Y depending on number of independent variables $X_2, X_3, \ldots, X_n$ with an unknown true relationship can be specified in the following manner

$$Y_i = \beta_1 + \beta_2 X_{2i} + \ldots + \beta_k X_{ki} + u_i . \quad (1)$$

In a sample of n observations on variables $Y, X_2, X_3, \ldots, X_k$ the OLS regression is used to fit the equation

$$\hat{Y} = b_1 + b_2 X_{2i} + \ldots + b_k X_{ki} , \quad (2)$$

where values for coefficients $b_1, b_2, \ldots, b_n$ are fitted so that the residuals' sum of squares are minimized. OLS, therefore, provides estimates of the independent, explanatory variables' $X_2, X_3, \ldots, X_n$ impact on the dependent variable Y.

The use of time series data with frequent intervals exposes the test results to certain difficulties, such as multicollinearity and autocorrelation. As autocorrelation is likely to be present in the quarterly time series regressions used to measure the economy-wide SEO volume, I use procedure suggested by Dougherty (2002, p. 342-344) by fitting a term with first lag of the regressors specified as part of the error term, which eliminates the problem of first-order autocorrelation in the regression models. As it comes to multicollinearity, time series data always suffers from it to a certain degree.

5.1.2 Logit regression

To address the micro level determinants of the SEOs, I perform cross-sectional logit regression analysis. I utilize the properties of logit regression in comparing firms that issue equity and firms that issue debt to distinct between firm characteristic that lead into SEO decision. I also report a single model with non-issuers as the control sample. Similar models have been performed by a number of authors (see, e.g., Marsh (1982), Hovakimian et al. (2001), Jung et al. (1996)). Hosmer and Lemeshow (2000) elaborate that logit regression is a well specified model to study the impact of independent variables to the binary dependent variable. Following Menard (2002) a logit regression overcomes the problems in linear models by estimating the log of the odds of falling into category 1, in this case SEO. Logit estimation with more than one explanatory variable hypothesizes that the probability of a given occurrence is determined by the function

$$p_i = F(Z_i) = \frac{1}{1+e^{-Zi}}, \tag{3}$$

where

$$Z_i = \beta_1 + \beta_2 X_{2i} + ... + \beta_k X_{ki}. \tag{4}$$

In this setting, parameters β_2, …, β_k refer to firm-specific ex ante attributes. By means of maximum likelihood estimation, the logit model assesses the impact of firm attributes to the likelihood of issuing seasoned equity. I use Huber-White robust covariances to alleviate the potential problem of heteroscedasticity. To estimate the strength of the relationship between a firm characteristic and the decision to issue equity, I use *z*-statistic and pseudo-R^2 similarly to *t*-statistics and adjusted R^2 in OLS-regression.

5.2 Abnormal returns of seasoned equity issuers

I measure sample firms' cumulative abnormal returns around the event to assess the possible wealth effects caused by the event. Furthermore, Brown and Warner (1980) discuss the properties of the event studies and claim that the magnitude of the abnormal return around the

announcement of an unanticipated event represents the impact of the event to firm claimholders. Moreover, in this thesis I employ event study methodologies suggested by Brown and Warner (1980) and (1985).

5.2.1 Short-term abnormal returns

I employ simple market model using OLS regression to estimate the abnormal performance of a security given the normal return predicted by its historical relationship with a benchmark index. Brown and Warner (1980) state that the strength of the market model lies in its ability to take into account the market wide movements in the stock prices that occur around the events of individual firms. The market index used to measure R_{mt} is the value-weighted FTSE All-Share index.[8,9] In order to estimate parameter values of α_i and β_i for each event firm, I use an estimation period of -290 to -40 trading days before the event. To be more precise, I employ the following market model

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \tag{5}$$

where R_{it} is the return for particular security i during day t and R_{mt} is the return for the benchmark index for the same day. β_i measures the sensitivity of security i to changes in the market index, α_i is an average measure of return not captured by the estimated β_i and finally, ε_i is the disturbance term assumed to be independent of market return and have a zero mean. The abnormal return AR_{it} caused by the event is measured using the α_i and β_i estimated in equation (5) in the following manner

$$AR_{it} = R_{it} - (\hat{a}_i + \hat{\beta}_i R_{mt}). \tag{6}$$

After calculating the abnormal returns for individual firms, I combine the sample to measure the average cumulative abnormal returns (CAR) for all the event firms. CARs are calculated as follows

$$CAR_{i,[t_1,t_2]} = \frac{1}{n}\sum_{i=1}^{n} AR_{t_1,t_2}, \tag{7}$$

where t_1 and t_2 are the beginning and the end of the event window period respectively. I calculate and report CARs for different time windows around the event, but mainly refer to commonly used [-1,+1] window, that is one trading day before the event to one trading day

[8] FTSE All-Share is the headline stock index in the United Kingdom aggregating the stocks of FTSE100, FTSE250 and FTSE Small-Cap corporations listed in the London Stock Exchange. FTSE All-Share contains 619 constituents and with a market capitalization of £1.28 trillion accounts for over 8 % of world's total equity market capitalization. (www.ftse.com)

[9] Asset pricing models generally refer to the use of value-weighted model. See more discussion in Brown and Warner (1980) p. 35-39

after the event, when discussing the empirical findings. In addition to the market model estimates, I address the robustness of the results by calculating also market adjusted returns measured simply as the event firm return less market return.

5.2.2 Long-term abnormal returns

As pointed out by numerous authors, see for example Kothari and Warner (1996, 2007) and Barber and Lyon (1997), short-term event studies are usually well specified, but in the long-term, numerous biases may occur. Barber and Lyon (1997) highlight three sources of biases present in often used event study methodologies. Namely, new listing bias, rebalancing bias and skeweness bias may all have an impact on the results if the model for detecting long-term event returns is not correctly specified. Moreover, according to Kothari and Warner (1996), both sample selection process and model specification may lead into flawed results. For the mitigation of the possible biases, Lyon et al. (1999) suggest careful sample design and using well specified matches to benchmark for normal returns.

Barber and Lyon (1997), Lyon et al. (1999) and Kothari and Warner (1996) discuss the merits of various approaches and state that the strength of buy-and-hold abnormal return approach (BHAR) is in its ability to better track actual investors' portfolio decisions, and moreover, the use of carefully specified matching firms yields unbiased results. In a similar manner, Jegadeesh (2000) investigates the ability of various specifications to measure abnormal long-term returns and concludes that the matching firm technique is superior to factor-models. I calculate BHARs using both, FTSE All-Share benchmark index and firms matched based on size and market-to-book to measure abnormal returns for event firms. Buy-and-hold returns for a period of T months are calculated as follows

$$BHAR_{iT} = \prod_{t=1}^{T}(1+R_{it}) - \prod_{t=1}^{T}(1+E_{it}), \tag{8}$$

where E_{it} is the return on the benchmark firm or portfolio and R_{it} is the return on event firm i. I calculate and report conventional cross-sectional t-statistics as suggested by Lyon et al. (1999).

$$t = \overline{AR_t} \Big/ \sigma(AR_t)/\sqrt{n}, \tag{9}$$

where $\overline{AR_t}$ is the sample mean, $\sigma(AR_t)$ is the cross-sectional sample standard deviation and n represents the number of observations in a given sample. I calculate the BHARs for various

time-periods, but mainly refer to 24-month and 36-month horizons in the analysis of the findings.[10]

To investigate the impact of firm-specific characteristics on the issuer abnormal returns I follow similar procedure to Andrikopoulos (2009) and Loughran and Ritter (1997) and use non-parametric Wilcoxon Signed-Rank Test. Specifically, I measure the difference in medians between subsamples of firms sorted by the hypothesized firm-specific ex ante characteristics. Wilcoxon Signed-Rank assumes and tests whether the two samples are of the same distribution. The absolute values of deviations from median are assigned a rank and the sum of the positive values is denoted as D. Wilcoxon signed-rank test *z*-statistics is computed as follows:

$$z = \frac{D - D(E)}{\sigma_D} \tag{10}$$

where $$E(D) = \frac{n(n+1)}{4} \tag{11}$$

and $$\sigma_D^2 = \frac{n(n+1)(2n+1)}{24}, \tag{12}$$

while $E(D)$ and σ_D^2 refer to sample expected value of ranked deviations' sum and variance of ranked deviations respectively. Under the assumption that the subsamples are drawn from the same distribution, *z*-statistics follows a normal distribution.

6 RESULTS

This chapter presents and discusses the results from empirical analyses that I perform to address the key research questions of the thesis. The first section elaborates the findings on economy-wide fluctuations in SEO volume and cross-sectional attributes of firms that decide to use SEO as a means of financing. The second section concentrates on the stock market performance of the SEO firms and the factors driving the performance.

[10] Traditional long horizon event studies employ time periods from 12 to 60 months subsequent to the event. In my thesis, I limit the period to 36 months as the offering data from the United Kingdom mainly is available from the recent 10-year period and therefore, following stock performance 60 months after the event would considerably decrease the sample size.

6.1 Macro and micro level determinants of seasoned equity offerings

The focus of this section is the determinants of the SEOs. The first subsection concentrates on the economy-wide determinants of SEO volume, while the second subsection addresses the determinants of micro level determinants of choice between equity and debt. Finally, Table IX at the end of the section pools together the hypotheses tested in the section and the empirical evidence found on the determinants of SEOs.

6.1.1 Macro level determinants of SEOs

The results shown in the subsection contribute to the ongoing debate on the factors that cause fluctuation in equity issue volumes. The subsection tests hypotheses H_1-H_4 on macro level determinants of SEOs. Howe and Zhang (2009) investigate the drivers of the SEO cycles and find that market timing and demand for capital seem to motivate equity issues the most. IPO volume, according to Lowry (2003) and Pastor and Veronesi (2005), fluctuates much of the same reasons. Moreover, they conclude that demand for capital, investor sentiment and market variables are important determinants of the IPO cycles.

Table VII
Macro determinants of SEOs

The table shows the impact of four different categories of proxies on the macro level SEO% defined as the number of UK SEOs in a quarter divided by the number listed firms at the end of the previous year. Stdev of daily mkt return$_{[t=0]}$ is the daily standard deviation of FTSE All-Share index returns within a quarter. Analyst dispersion$_{[-1]}$ is the weighted average standard deviation of analyst recommendations on FTSE 100 index companies at the end of the preceding quarter, where the number of analysts following a firm are the weights. Sales growth$_{[+1,+4]}$ is the sales growth of all UK listed companies from 1 quarter to 4 quarters following the given quarter. GDP growth$_{[-1,+2]}$ is the UK GDP growth from 1 quarter prior to 2 quarters following the given quarter. Interest rate avg.$_{[-4,-1]}$ is the average LIBOR rate from four quarters prior to one quarter prior to the given quarter. SENT index$_{[0]}$ is the UK consumer sentiment in the quarter. Market-to-book median$_{[0]}$ is the market-to-book of all UK listed companies. Mkt return$_{[-4,-1]}$ is the return on FTSE All-Share index from four quarters to one quarter prior to given quarter. Mkt return$_{[+1,+4]}$ is the return on FTSE All-Share index from one quarter to four quarters following a given quarter. AR(1) specification eliminates first order autocorrelation by importing the first lag of independent variables to the model. The sample consists of 59 quarterly observations from Q1 1994 to Q3 2008. Number of SEOs is sourced from Dealogic, financial data from Thomson's Worldscope, data on analyst recommendations from I/B/E/S history, while stock data and economic variables are retrieved from Datastream. Adjusted *R*-squared and *F*-statistics are reported as measures of model precision. *T*-statistics, using heteroscedasticity consistent standard errors as suggested by White, of no relationship between dependent and independent variables are reported under coefficients, where * and ** denote to statistical significance of the relationship between variables at 5 % and 1 % levels respectively.

OLS-regression Dependent varaible: SEO%	(1) Information asymmetry	(2) Capital demand	(3) Market timing	(4) Investor sentiment	(5) All proxies[a]	(6) All proxies[b]
Intercept	0.04 *14.10***	0.04 *5.25***	0.03 *2.61**	0.03 *10.68***	0.06 *4.14***	0.05 *4.10***
Information asymmetry proxies						
Stdev of daily mkt return$_{[0]}$	-0.95 *-6.21***				-0.78 *-2.62**	-0.86 *-2.79***
Analyst dispersion$_{[-1]}$	-0.01 *0.56*				-0.01 *-0.95*	0.00 *-0.24*
Capital demand proxies						
Sales growth$_{[+1,+4]}$		0.05 *3.16***			0.05 *3.83***	0.04 *3.94***
GDP growth $_{[-1,+2]}$		-0.09 *-0.67*			-0.07 *-0.99*	-0.12 *-1.71*
Interest rate avg.$_{[-4,-1]}$		-0.31 *-2.44**			-0.40 *-4.51***	-0.33 *-4.40***
Market timing proxies						
Market to Book median$_{[0]}$			0.00 *-0.20*		0.00 *-0.92*	0.00 *-0.22*
Mkt return$_{[-4,-1]}$			0.03 *2.34**		0.03 *2.73***	0.02 *2.89***
Mkt return$_{[+1,+4]}$			-0.01 *-1.50*		-0.02 *-3.81***	-0.02 *-3.33***
Investor sentiment proxies						
SENT index$_{[0]}$				0.00 *1.18*	0.00 *-3.13***	0.00 *-2.16**
AR (1) specification	0.40 *2.97***	0.34 *2.23**	0.33 *2.61**	0.46 *3.66***	-0.04 *-0.34*	0.11 *0.98*
Adjusted R-squared	0.28	0.27	0.31	0.19	0.50	0.57
F-statistic	8.47	6.27	7.42	7.81	6.76	8.52
P-value, F-statistic	<0.01**	<0.01**	<0.01**	<0.01**	<0.01**	<0.01**
Number of observations	58	58	58	58	58	57

[a] Model using all quarterly observations, [b] model excluding single outlier observation at Q1 2000

With a sample of 59 quarterly observations including 2,670 UK SEOs, I find strong evidence supporting market timing and demand for capital hypotheses. Table VII presents the results from various time-series regression models. In the UK market, the most significant drivers of macro fluctuation in SEOs are sales growth, interest rates and stock market returns prior to and following an issue.

i) Demand for capital

When aggregate future sales growth in the UK is high, firms' demand for capital is at its highest, and a fraction of the demand is satisfied by means of seasoned equity offerings.

Interestingly, Lowry (2003) finds that sales growth of public firms is related to the number of IPOs, yet the findings presented in Table VII indicate that the mechanism for SEOs is somewhat stronger. Namely the *t*-statistics of sales growth at 3.94 persists after inclusion of various control variables and is clearly statistically significant at all conventional levels. The strength of the demand for capital hypothesis is further supported by the negative and statistically significant sign of interest rates with a *t*-statistics of 4.40. Using a large sample of US SEOs, Howe and Zhang (2009) report similar findings on interest rate, but their findings on the role of future sales growth contradicts with mine. In their models, GDP growth is a significant determinant of SEOs. A possible interpretation of the difference is that GDP growth and sales growth actually measure the changes in same underlying fundamentals, but only at slightly different perspectives.

ii) Market timing

Market timing variables are significant macro determinants of SEOs. Namely, high volume periods occur after 12-month stock market run-ups and are followed by periods of low returns even after controlling for market-to-book. The coefficients of both variables, pre and post-issue 12-month stock market returns, are statistically significant at the 1 % level. Pastor and Veronesi (2005) develop a model of optimal IPO timing and report similar findings on stock market mechanics around the IPO volume fluctuations.

iii) Information asymmetry

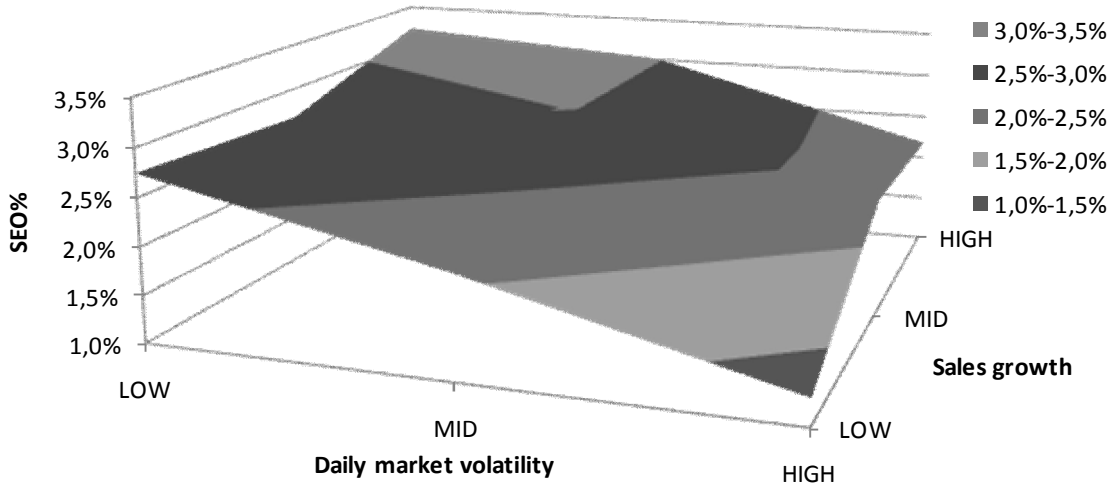
After controlling for multiple classes of hypotheses, the impact of information asymmetry proxies deteriorate. Yet, stock market volatility still seems to be an important determinant with more companies filing an SEO when market volatility is at a low level. Moreover, the *t*-stat of market volatility is -2.62 after controlling for various factors. Howe and Zhang (2009) find market volatility to affect in a similar way, but being only marginally statistically significant. The analyst dispersion as an information asymmetry proxy enters the regression models with a weak negative sign, but does not seem to be an important determinant of macro level SEO volume.

iv) Investor sentiment

Finally, the hypothesized link between investor sentiment and macro SEO volume is weak at most, or alternatively, the consumer sentiment index does not indicate such relationship to exist. The hypothesized positive linkage is not supported by the regression estimates, while

Howe and Zhang (2009) report similar weak association between consumer sentiment index and SEO volume.

Panel A. The joint effect of daily market volatility and sales growth on median SEO%.



Panel B. The joint effect of pre and post-issue market returns on median SEO%.

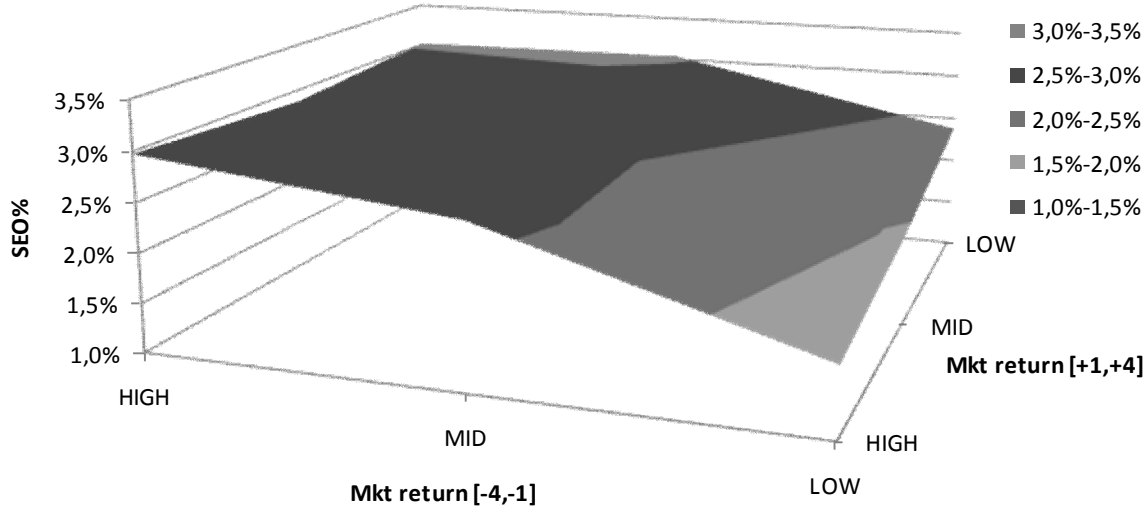


Figure 2: Macro determinants of SEOs

The figure presents the impact of selected macro level variables on SEO%. SEO% is the number of SEOs in the UK within a quarter divided by the number public companies at the end of the previous year. **Panel A)** shows the joint effect of sales growth and daily market volatility on SEO% while **Panel B)** shows the joint effect of preceding and subsequent market stock returns on SEO%. Daily market volatility is the daily standard deviation of FTSE All-Share index returns within a quarter. Sales growth is the sales growth of all UK listed companies from 1 quarter to 4 quarters following the given quarter. Mkt return$_{[-4,-1]}$ is the return on FTSE All-Share index from four quarters to one quarter prior to the given quarter. Mkt return$_{[+1,+4]}$ is the return on FTSE All-Share index from one quarter to four quarters following a given quarter. The sample consists of 59 quarterly observations from Q1 1994 to Q3 2008. Number of SEOs is sourced from Dealogic, financial data from Thomson's Worldscope while stock data and economic variables are retrieved from Datastream.

Figure 2 graphically illustrates the joint effect of market volatility and sales growth, as well as the impact of stock market returns prior to and following a quarter on the UK SEO volume. Furthermore, as shown in Panel A, a decrease in market volatility leads into a notable increase in number of SEOs. Similarly, higher sales growth is accompanied by an increase in the number of SEOs. The joint explanatory power of the two variables seems strong. On the other hand, the impact of market timing variables seems two-fold. While the higher level of stock returns before the quarter clearly leads into an ascended SEO volume, the stock returns following an issue has a less clear relationship with the SEO volume. Panel B in Figure 2 indicates that high volume SEO quarters occur following a stock market run-up, but low future stock returns lead into an increased number of issues, only when the stock market returns have been poor ex ante. Lowry (2003) discusses several potential reasons for the observed patterns of stock market performance around the changes in equity issue volume. First, investors realize that firms' demand for capital is increasing and market returns increase in response to the investment opportunities. Second, market returns can be lifted by the increase in investor optimism. Third, market returns may reflect changes in the stock market premium.

To conclude the analysis on macro determinants, it seems that the most consistent determinants of SEOs at the macro level are demand for capital (sales growth) and market timing (past stock market returns). The evidence to support the two additional hypotheses on investor sentiment and information asymmetry seems fragile. The presented findings on market timing and demand for capital provide an interesting platform to study the micro level determinants of seasoned equity offerings, which will be the topic of interest in the subsequent subsection.

6.1.2 Micro level determinants of SEOs

This subsection extends the macro level analysis of SEOs to a single-firm decision making analysis. I aim to distinct between firm characteristics that explain why some firms choose an SEO while others issue debt and thus, test hypotheses H_5-H_7 on micro level determinants of SEOs. Jung et al. (1996) and Marsh (1982) perform similar analysis on the debt-equity choice, while Hovakimian et al. (2001) analyze changes in capital structure using similar models. When deciding on the set of independent variables to the regression models, I partly follow prior literature, add new variables when necessary to test the posed hypotheses and avoid pairs of variables with high correlation to maintain robustness of results. A great

majority of the literature on company financial policy employ a fixed set of control variables in regressions: company size, capital structure, profitability, research and development intensiveness, tangibility of assets and the level of financial slack. I see no reason to deviate from the norm, even when the coefficients indicate that the variable does not belong to the model. Finally, as the UK evidence on determinants of equity issuance is largely lacking, I analyze my results in light of the existing US literature

Table VIII
Micro determinants of SEOs

The table shows determinants of cross-sectional SEO vs. debt issue choice. In models (1) – (4), the likelihood of company specific factors on SEO vs. debt issue choice is estimated by logit regression where SEOs get value of 1 and debt issues value of 0. Equity issues are sourced from Dealogic and debt issues from Thomson. The company financials are sourced from Thomson's Worldscope, data on analyst following from I/B/E/S history and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 423 firm years with an equity issue and 1 097 firm years with a debt issue. In model (5), the likelihood of the firm-specific factors on SEO vs. non-SEO choice is estimated, where SEOs get value of 1 and non-SEOs get value of 0. The sample includes the similar 423 firm years with an SEO and 9 130 firm years with no SEO. Analyst coverage dummy variable gets value of 1 if the firm is followed by one or more analysts, and value of 0 otherwise. Stdev of firms' daily stock return is measured from 250 trading days before the issue to 50 trading days before the issue. PRE and POST stock returns are calculated as the firm's raw returns for the 12-month period prior to and following an issue. Dividend is a dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. Financial slack (cash and cash equivalents / total assets), Debt / Total assets, Capex / Total assets, EBITDA / Total assets, Market-to-Book, LNsales and PPE / Total assets are measured at the previous year end. Sales growth is measured in the issue year. *Z*-statistics, with heteroscedasticity consistent robust standard errors as suggested by Huber and White, of no impact on equity vs. debt choice likelihood are reported, where * and ** denote to statistical significance of the relationship at 5 % and 1 % levels respectively. Pseudo-R^2 and LR statistic are reported as measures of model explanatory power.

Logit regression SEO = 1, Debt issue = 0 [a]	(1) Information asymmetry	(2) Capital demand	(3) Market timing	(4) All proxies	(5) All proxies[a]
Information asymmetry proxies					
Analyst coverage	0.539 *3.26***			0.539 *2.62***	0.831 *5.49***
Debt / Total assets	0.797 *2.30**			1.388 *3.59***	4.451 *10.08***
Capital demand proxies					
Sales growth		0.002 *2.63***		0.002 *2.51**	1.297 *8.32***
R&D		0.563 *3.79***		0.629 *3.97***	0.632 *3.72***
Capex / Total assets		1.034 *1.04*		0.374 *0.34*	-0.087 *-0.18*
Market timing proxies					
Market-to-book			0.110 *1.96**	0.105 *1.70*	-0.008 *-0.75*
PRE 12m stock return			0.696 *3.92***	0.684 *3.68***	0.848 *4.51***
POST 12m stock return			-0.192 *-1.81*	-0.206 *-1.81*	-0.478 *-2.98***
Control variables					
Stdev of daily return	11.060 *2.41**	7.414 *1.50*	15.065 *2.70***	14.997 *2.42**	57.205 *9.45***
EBITDA / Total assets	-0.985 *-1.82*	-0.974 *-1.75*	-2.105 *-3.13***	-1.817 *-2.61***	-1.754 *-2.10**
Dividend	-0.464 *-3.30***	-0.342 *-2.33**	-0.309 *-2.08**	-0.218 *-1.41*	-0.675 *-5.20***
Financial slack	1.491 *3.18***	1.088 *2.29**	0.668 *1.24*	1.091 *1.86*	-0.239 *-0.40*
LNsales	-0.006 *-0.15*	0.018 *0.52*	0.083 *2.61***	-0.029 *-0.70*	-0.378 *-9.31***
PPE / Total assets	-0.466 *-2.06**	-0.304 *-1.06*	-0.136 *-0.59*	-0.287 *-0.92*	0.004 *1.19*
Year dummies	Yes	Yes	Yes	Yes	Yes
Pseudo-R^2	0.07	0.08	0.09	0.13	0.24
LR statistic	117.38	125.63	156.03	195.25	723.74
Prob. LR statistic (χ^2)	<0.01**	<0.01**	<0.01**	<0.01**	<0.01**
Number of observations	1,464	1,371	1,402	1,321	9,328

[a] Regression model (5) employs a sample of non-SEO firm years as the control sample

The results from the logit regression performed to analyze micro level determinants of SEOs are presented in Table VIII. As shown, the multivariate analysis reveals that several distinct characteristics between equity and debt issuers exist.

i) Information asymmetry

I observe and report analyst coverage and leverage to be positively associated with the likelihood of equity issue. After controlling for other hypotheses, both proxies on information asymmetry maintain statistical significance at the 1 % level. Jung et al. (1996) report high leverage to affect in a similar manner – they argue that it possibly reflects the impact of deviation from the firm's target leverage. Similarly, several authors are of the opinion that high leverage is a characteristic of low growth opportunity and low information asymmetry firms and therefore, it should be positively related to the likelihood of SEO issuance. (Dittmar and Thakor (2007), Rajan and Zingales (1995).

ii) Demand for capital

In model (2) of Table VIII the capital demand proxies enter the regression with positive sign, yet only sales growth and research and development expenditures show statistical significance. Theoretically according Myers (1977) framework, high investment opportunity firms should be of low leverage as equityholders get all the benefit from the upside potential, while debtholders bear the increased costs of financial distress. All in all, my findings indicate that proxies of capital demand are among the main characteristics to lead into an increased probability of an equity issue.

iii) Market timing

Market timing proxies, as numerous authors report, are clear distinct factor between equity and debt issuers. Jung et al. (1996) report that both market-to-book and past stock returns are significantly related to the likelihood of an equity issue. Moreover, they argue that the strong association between past stock returns and equity issue likelihood stems from the managers' activity to time the market. The authors in addition state that the presence of market-to-book is highly significant in the regression given that the omission of the variable leads pseudo-R^2 to fall by almost one-third. My findings on market timing proxies coincide with theirs' given that the impact of market-to-book in models (3) and (4) is far lower than stated by Jung et al. (1996).

I also run logit regressions with the same sample of 432 firm years with equity issue using a sample of 9,130 firm years with non-issuers as the control sample.[11] As can be hypothesized, the demand for capital proxies and market timing proxies show more statistical significance

[11] The sample collection process of the control sample of no SEO firm years is presented in the Appendix 1.

than in the reported models with debt issuers as the control sample. Earlier literature shows that debt issuers are also likely to undergo a period of high stock return preceding an issue (see, e.g., Marsh (1982), Jung et al. (1996)), but as the control sample becomes non-issuers, the strengthening sign of pre-issue stock returns is expected. Moreover, in the reported models (1) - (4) it is given that firm increases the level of external capital for one way or another, whereas in the model (5) with non-issuers as the control sample, large fraction of the firms choose to do nothing. In these circumstances, the strength of demand for capital proxies is natural, as growth firms with solid investment opportunities are more likely to raise external capital. The sales growth variable is highly significant at all conventional levels and the strong positive sign of R&D variable persist after changing the control group. In addition, the positive linkage of both analyst following and leverage further strengthens in model (5), which implies that firms who seek equity financing can communicate their intentions to the market through the independent analysts and are high leverage firms with low information asymmetry by nature. The strong negative sign of logarithm sales and positive sign of volatility indicates that the use of non-issuers as the control sample leads into poor match between the two samples. The coefficient of determination in model (5), pseudo-R^2, is clearly higher than in models (1) – (4) with debt issuers as the control sample. Therefore, many distinct firm characteristics exist between SEO firms and non-issuers. However, I choose to only report a single regression with non-issuers as the control group since the earlier literature mainly refers to equity vs. debt choice (see, e.g., Marsh (1982), Hovakimian et al. (2001)).

Finally, similarly to the macro level analysis, market timing hypothesis appears to be a strong determinant of SEO issuance. In addition, I find strong evidence that low information asymmetry firms with analyst coverage and high leverage are likely to conduct an SEO. The impact of both market timing and information asymmetry proxies persists in different model specifications. The association between demand for capital and SEO likelihood seems slightly weaker, yet statistical significance of sales growth and R&D expenditures suggest that demand for capital is a micro level determinant of equity issues.

Table IX
Summary of findings on SEO determinants

The table pools together the hypotheses on macro and micro level determinants of SEOs, the proxy variables employed in the tests and the empirical findings on the hypotheses. The "+" (positive linkage) and " –" (negative linkage) signs after the hypotheses address the theoretical prediction of the relationship between each class of hypotheses and the SEO volume or decision. The column on the right indicates whether the hypothesis ought to be accepted based on the empirical findings.

Summary of findings: macro and micro level determinants of SEOs		
Macro level: the impact of economy-wide variables on SEO volume		
Hypotheses & prediction	Proxies	Accepted/Rejected
H_1: Market timing (+)	Market-to-book, market return (pre and post)	Accepted
H_2: Asymmetric information (-)	Analyst dispersion, market volatility	Weak support
H_3: Demand for capital (+)	Aggregate sales growth, GDP growth, Interest rate	Accepted
H_4: Investor sentiment (+)	Consumer sentiment index	Rejected
Micro level: the impact of issuer characteristic on choice between equity and debt financing		
H_5: Market timing (+)	Market-to-book, stock return (pre and post)	Accepted
H_6: Asymmetric information (-)	Analyst coverage, leverage	Accepted
H_7: Demand for capital (+)	Sales growth, capex growth, R&D expenditures	Accepted

Table IX summarizes the findings on the macro and micro determinants of SEOs presented in the preceding subsections. Market timing theory of equity issuance documented in several academic papers appears to drive the SEOs both at the macro and micro level. Moreover, past market returns drive changes in aggregate SEO volume, while firms' past stock returns increase the likelihood of choosing to raise seasoned equity instead of debt. In addition, macro level demand for capital proxies, aggregate future sales growth and average interest rates, imply strong positive linkage to SEO volume. In addition, I find some evidence to support the capital demand hypothesis as the micro level determinant of SEOs. Namely, firms to issue equity have analyst coverage and more levered capital structures as opposed to the debt issuers, while also they are more likely to heavily investing growth firms. After the analyses on both macro and micro level determinants the following sections present the findings on equity issuers' stock market performance.

6.2 Issuer stock market performance

This section presents the findings on SEO firms' stock market performance around the issue. The first subsection presents and discusses the findings on announcement returns and the factors determining the observed returns, while the second subsection concentrates on the

issuer long-term underperformance following the issue using a set of pre-issue firm characteristics in explaining the stock market performance. Finally, Table XVII at the end of the chapter summarizes the findings on the hypothesized relations between issuer characteristics and stock market performance.

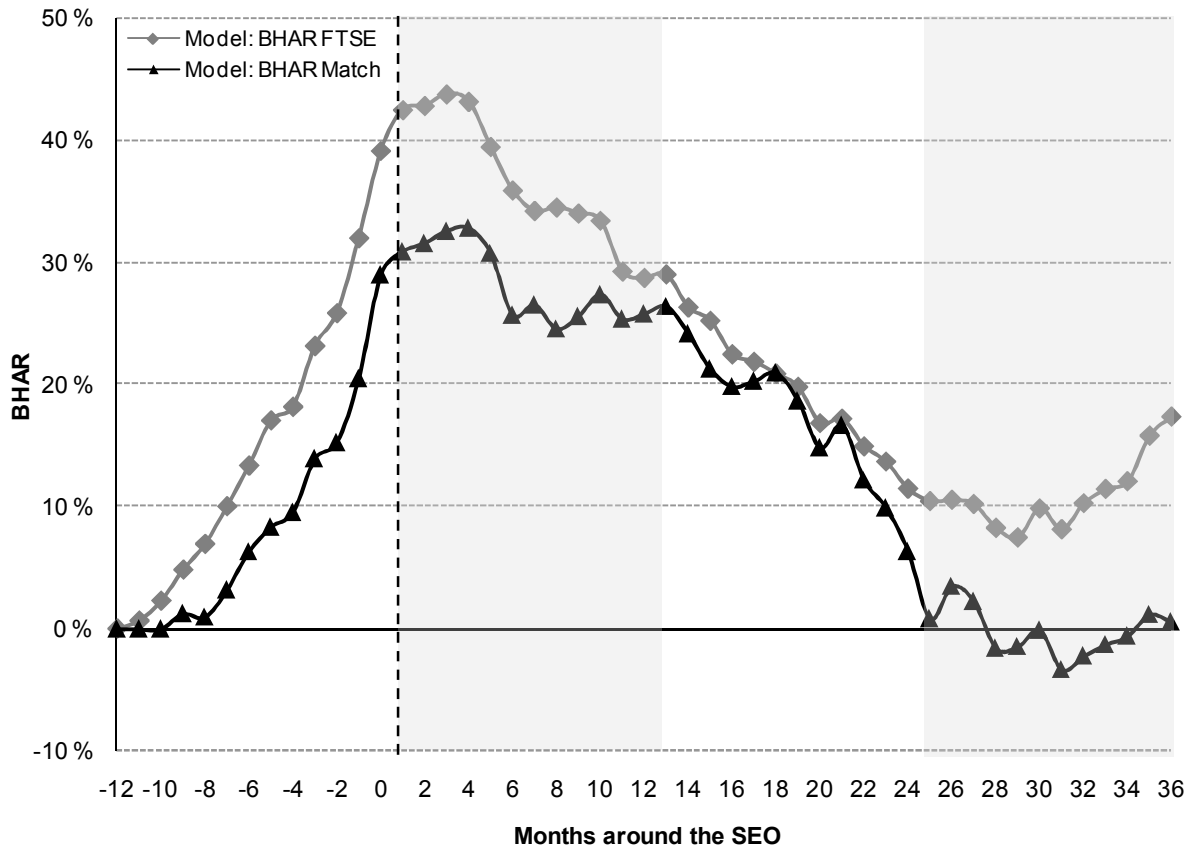


Figure 3: Buy-and-hold abnormal returns of SEO firms: total observation period
The figure presents buy-and-hold abnormal returns (BHAR) from 12 months prior to an issue to 36 months following the issue for total sample of 543 SEOs during period 1999-2007. All UK SEOs with deal value in excess of €5 million are sourced from Dealogic. The financial data for event firms and matching firms are sourced from Thomson's Worldscope, while the stock data are sourced from Datastream. The dim line measures BHARs calculated using FTSE All-Share stock index as the benchmark, while the dark line measures BHARs calculated using size and market-to-book matched firms as the benchmark. The BHARs represent equally weighted sample averages.

In general, my findings on the stock return mechanisms around the SEOs are parallel to the predominant understanding in the area of issuer stock market performance. Figure 3 presents the 48-month buy-and-hold abnormal returns with the observation period starting from 12 months before the issue. Moreover, despite the chosen benchmark for normal returns, I find the issuers to experience statistically significant and economically notable positive abnormal

returns during the 12 months preceding the issue. The market adjusted 12-month equally weighted average stock returns prior to the issue announcement amount to 34.2 %, while the issuers outperform their non-issuing matching firms by 28.0 %. In addition, the issuers begin to underperform relative to the benchmarks within six months following the issue and continue to be poor long-term investments throughout the 36-month post-issue period. From the Figure 3 it can be seen that the use of FTSE All-Share as the benchmark (dim line) leads into clearly higher pre-issue abnormal returns than size and market-to-book matched firms (black line). On the other hand, the post-issue period dynamics between the two different benchmarks are also somewhat different as will be shown in the following subsections.

6.2.1 Announcement effect

In this subsection, I focus on the announcement effect of SEOs. I pay attention to the analysis of the factors contributing to the abnormal returns. Earlier literature on topic has been mainly conducted employing US data (see, e.g., Masulis and Korwar (1986), Asquith and Mullins (1986)) and the announcement effect is typically calculated during two or three-day event window. Predominant practice in the short-term event studies is to calculate abnormal returns using market model estimates for α and β. I follow earlier literature and also report market adjusted returns.

Table X
SEO announcement effect: total sample

The table presents the announcement effect of seasoned equity offerings at the total sample level. The results are estimated and reported using both market model and market adjusted returns and presented separately for [-1,+1] and [-5,+5] event windows. The sample of equity issues is sourced from Dealogic, while the stock data is sourced from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. 1 % with largest and smallest announcement CARs are sorted out from the sample. Equally weighted sample averages, *t*-statistics and proportion of positive CARs are reported.

Total sample of SEOs (n=543)	Announcement CARs					
Event window	[-1,+1]			[-5,+5]		
	Average	*t-stat*	% positive	Average	*t-stat*	% positive
Market model	0.08 %	*0.22*	50.70 %	0.22 %	*0.43*	49.30 %
Market adjusted	0.14 %	*0.32*	51.39 %	0.02 %	*0.04*	50.28 %

Table X shows that at the total sample level, the equally weighted average announcement effect of UK SEO firms is slightly positive, employing various event windows and both

market model and market adjusted abnormal returns. The announcement effect is far from being statistically significantly different from zero, which is not surprising in the light of the previous literature on the UK SEOs. The study with most similar data sample to the one employed in the thesis, Barnes and Walker (2006), report total sample weighted average announcement effect of -0.33 %. Similarly, Slovin et al. (2000) report announcement effect strongly dependent on the floatation method, with the total sample weighted average of -1.44 %. Their results are parallel to mine given that in their studies, the proportion of rights issues is clearly larger than in my sample, while the negative announcement effect in the previous studies is driven by rights issues. While considerably large differences in announcement effect exist in the cross-section, the abnormal returns are evenly distributed around zero in all cases as close to 50 % of the SEOs undergo positive announcement returns. All in all, my findings support the notion that SEOs in Europe differ somewhat from the US SEOs. A possible explanation for the observed differences in the announcement effect is the high institutional ownership among the UK pension funds and insurance companies that tend to operate as passive long-term investors as opposed to the US mutual funds and investment firms.

Table XI
SEO announcement effect: CARs and issuer characteristics

The table shows the impact of issuer/issue specific factors on the announcement effect of SEOs. Firms are sorted into quintiles based on market-to-book (Panel A), 12-month pre-issue stock returns (Panel B), sales growth during the issue year (Panel C) and SEO%, the number of UK SEOs within the issue quarter divided by the number of UK listed companies at the previous year end (Panel D). 1 % of observations with largest and smallest CARs are removed from the sample. The *t*-test of equal means and Wilcoxon signed-rank test of equal medians between HIGH quintile and LOW quintile address the impact of the given factor to the announcement effect. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. The results are reported separately for market model and market adjusted CARs during [-1,+1] event window. *T*-statistics and z-statistics for no difference between HIGH and LOW quintiles are reported next to coefficients, where * and ** denote to statistical significance of the difference at 5 % and 1 % levels respectively.

Performance of event firm quintiles		SEO announcement effect CAR [-1,+1]						
Panel A:		**Market to Book**						
Model		LOW (1)	(2)	(3)	(4)	HIGH (5)	HIGH - LOW difference (5) - (1)	
Market model	Average	-1.1 %	-0.5 %	0.7 %	-0.5 %	1.1 %	Difference	2.2 %
	t-stat	*-1.10*	*-0.78*	*0.73*	*-0.44*	*0.94*	*t-stat*	1.43
							Wilcoxon z-stat	1.63
Market adjusted	Average	-1.0 %	-0.2 %	0.6 %	0.3 %	0.9 %	Difference	1.9 %
	t-stat	*-1.09*	*-0.39*	*0.65*	*0.31*	*0.85*	*t-stat*	1.35
							Wilcoxon z-stat	1.76
Panel B:		**12-month pre-issue stock return**						
Model		LOW (1)	(2)	(3)	(4)	HIGH (5)	HIGH - LOW difference (5) - (1)	
Market model	Average	-3.7 %	1.7 %	-0.6 %	0.5 %	1.8 %	Difference	5.5 %
	t-stat	*-3.04***	*2.31**	*-0.99*	*0.72*	*2.20**	*t-stat*	3.75**
							Wilcoxon z-stat	3.11**
Market adjusted	Average	-3.4 %	1.7 %	-0.5 %	0.9 %	2.9 %	Difference	6.2 %
	t-stat	*-2.95***	*2.68***	*-0.86*	*1.44*	*3.44***	*t-stat*	4.41**
							Wilcoxon z-stat	3.07**
Panel C:		**Sales growth**						
Model		LOW (1)	(2)	(3)	(4)	HIGH (5)	HIGH - LOW difference (5) - (1)	
Market model	Average	-1.0 %	-1.0 %	0.6 %	1.0 %	2.2 %	Difference	3.2 %
	t-stat	*-0.66*	*-0.87*	*0.55*	*0.96*	*2.42**	*t-stat*	1.85
							Wilcoxon z-stat	2.96**
Market adjusted	Average	-1.0 %	-1.5 %	0.2 %	1.5 %	2.7 %	Difference	3.6 %
	t-stat	*-0.68*	*-1.31*	*0.18*	*1.71*	*2.85***	*t-stat*	2.14*
							Wilcoxon z-stat	2.76**
Panel D:		**SEO%**						
Model		LOW (1)	(2)	(3)	(4)	HIGH (5)	HIGH - LOW difference (5) - (1)	
Market model	Average	-0.6 %	-0.8 %	-0.4 %	-0.6 %	2.2 %	Difference	2.8 %
	t-stat	*-0.58*	*-0.75*	*-0.35*	*-0.71*	*2.25**	*t-stat*	1.93
							Wilcoxon z-stat	1.43
Market adjusted	Average	-1.2 %	-0.6 %	0.4 %	-0.1 %	2.1 %	Difference	3.3 %
	t-stat	*-1.13*	*-0.61*	*0.52*	*-0.06*	*2.41**	*t-stat*	2.42*
							Wilcoxon z-stat	1.86

Univariate analysis on announcement effect determinants

Table XI presents the relationship between the announcement effect and the firm-specific characteristics. Firms are sorted into quintiles based on the hypothesized characteristics of impact, which relate to the hypotheses H_8-H_{10}.

i) Market timing

Testing the impact of market timing on stock market announcement effect, I employ both market-to-book and past stock returns as the market timing proxies. I find past 12-month raw stock return to be significantly positively related to the announcement effect – the results persist regardless of the model specification and both calculating from averages and medians. However, I find that market-to-book only slightly indicates positive linkage to the announcement effect. My findings are partly parallel to the findings in earlier literature. Jung et al. (1996) report market-to-book to be positively related to the announcement effect and past stock returns to have positive but insignificant effect. Choe et al. (1993), on the other hand, show that stock market run-up is positively related to the announcement effect of SEOs, but they do not control for the market-to-book. Interestingly, the findings of Bayless and Chaplinsky (1996) contradicts with other prominent research as they find past stock returns to positively contribute to the SEO announcement effect only during cold periods of equity issuance, while the impact during hot periods is negative. In addition, the sign of q-ratio measured as the market value of assets divided by the book value of assets remains positive in all circumstances, but is significant only in cold periods. The authors hypothesize that the documented relationships may stem from investors' tendency to place more weight on measures of firm quality during cold markets when information asymmetry could be more hazardous at worst. All in all, the impact of past stock returns seem to be a determinant of the UK SEO announcement effect, while the earlier literature from the US reports lower linkage between market timing and announcement returns (see, e.g., Choe et al. (1993), Bayless and Chaplinsky (1996)).

ii) Demand for capital

Myers and Majluf's (1984) pecking order theory implies that firms with profitable investment opportunities can operate free of information asymmetry problem, due to the well motivated demand for capital. The vast literature on topic is of two distinct opinions: while some papers report positive correlation between growth opportunities and announcement return, the others show high growth firms experiencing more negative returns due to severe information

asymmetry. I investigate the impact of capital demand on the SEO announcement effect using sales growth- % at the issue year as the demand for capital proxy. Panel C in Table XI shows that the impact of sales growth on the announcement effect is positive. Wilcoxon *z*-statistics for difference in medians show statistical significance at 1 % level. Denis (1994) investigates the impact of investment opportunities on SEO announcement effect and report similar findings. Moreover, he finds that various proxies of growth opportunities have positive relationship with equity offering announcement return. A careful analysis suggests that his results are driven by a group of extremely fast growing firms and that the findings do not apply at the total sample level. On the other hand, Burton et al. (2000) investigate a sample of 116 UK SEO announcements taking place during the period 1989-1991. They use accounting information to proxy for growth opportunities and report that while income growth is the only variable with a positive impact on the announcement effect, the relationship is not monotonic, and instead driven by a group of highly unprofitable firms. In response to the findings of Denis (1994) and Burton et al. (2000), I sort out young firms and firms in extreme fast growth phase and despite get similar results than reported in Table XI. Furthermore, the finding indicates that the demand for capital hypothesis seems to contribute to the announcement effect, but the results have to be analyzed further. The implication of the observed finding could be that high capital demand firms can invest the cash raised by an SEO more profitably than firms with low demand for capital. Finally, Walker and Yost (2008) conclude that market interprets SEO announcement positively, if the firm has solid investment opportunities.

iii) SEO volume

Panel D in Table XI reports the relationship between macro level SEO volume and the announcement effect. I find the highest market volume quintile to undergo significantly positive announcement return, while the remaining four quintiles do not show remarkable differences from each others. The findings are consistent with the information asymmetry hypothesis, namely during extremely active periods of equity issuance investors know the lemons problem is at its smallest. Bayless and Chaplinsky (1996) report similar findings as they find hot period SEOs to have significantly higher announcement returns than cold period SEOs. Bayless and Chaplinsky (1996) and Choe et al. (1993) explain the phenomenon to stem from investors' estimates on probability of overvaluation, which fluctuate along with stock market variables and macroeconomic conditions.

Table XII
SEO announcement effect: regression analysis of CARs

The table shows OLS regression estimates for determinants of cumulative abnormal returns around the announcement of SEOs. The regressions are estimated for event windows of [-1,+1] and [-5,+5] days using both market model and market adjusted returns in estimation of CARs. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. 1 % of observations both with highest and lowest CARs and past stock returns are removed from the sample. Financial slack (cash and cash equivalents / total assets), Debt / Total assets, Capex / Total assets, EBITDA / Total assets, Market-to-Book, LNsales and PPE / Total assets are measured at the previous year end. Sales growth is measured in the issue year. Dividend is a dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. Past 12m stock return is the firm's 12-month raw stock return prior to the issue announcement. SENT is the level of UK consumer sentiment index in the issue month. Issue size is the total deal value divided by the previous year end market cap. SEO% is the number of SEOs in the UK within the event quarter divided by the number public companies at the end of the previous year. *T*-statistics, with heteroscedasticity consistent standard errors as suggested by White, for no relationship between dependent and independent variables are reported next to coefficients, where * and ** denote to statistical significance of the relationship at 5 % and 1 % levels respectively. F-statistics and R-squared are reported as measures of model explanatory power.

Cross-sectional OLS regression	Dependent variable: SEO announcement CAR [-1,+1] and [-5,+5]							
	Market model				**Market adjusted**			
	[-1,+1]		[-5,+5]		[-1,+1]		[-5,+5]	
Independent variables	Estimate	*t-stat*	Estimate	*t-stat*	Estimate	*t-stat*	Estimate	*t-stat*
Market-to-Book	0.001	*0.78*	-0.001	*-0.63*	0.001	*0.63*	-0.001	*-0.52*
Past 12m stock return	0.017	*2.93***	0.019	*2.04**	0.021	*3.48***	0.022	*2.68***
Sales growth	0.012	*0.91*	0.016	*0.68*	0.011	*0.80*	0.007	*0.38*
SEO%	0.750	*1.02*	0.327	*0.30*	0.944	*1.20*	0.391	*0.37*
Dividend	0.016	*1.50*	0.025	*1.64*	0.019	*1.73*	0.031	*2.17**
SENT	0.002	*0.64*	0.003	*0.72*	0.002	*0.77*	-0.001	*-0.38*
Issue size	0.009	*0.87*	0.017	*1.16*	0.011	*1.27*	0.002	*0.22*
LNsales	-0.001	*-0.26*	-0.001	*-0.13*	-0.002	*-0.79*	-0.003	*-0.86*
Debt / Total assets	0.034	*1.55*	0.019	*0.56*	0.038	*1.72*	0.014	*0.46*
PPE / Total assets	-0.012	*-0.87*	-0.048	*-2.12**	-0.012	*-0.84*	-0.037	*-1.97**
EBITDA / Total assets	-0.006	*-0.41*	-0.030	*-1.04*	0.007	*0.43*	0.010	*0.62*
Financial slack	0.019	*0.67*	-0.001	*-0.01*	0.019	*0.62*	-0.007	*-0.16*
R&D	0.010	*0.94*	-0.005	*-0.40*	0.014	*1.35*	0.006	*0.46*
Intercept	-0.034	*-0.78*	-0.003	*-0.06*	-0.022	*-0.45*	0.019	*0.32*
Year dummies		Yes		Yes		Yes		Yes
F-statistic		1.732		1.629		2.527		1.778
P-value, F-statistic		0.02*		0.04*		<0.01**		0.02*
R-squared		0.090		0.085		0.126		0.092
Number of observations		519		519		519		519

Multivariate analysis on announcement effect determinants

I also perform cross-sectional regression analysis to investigate the robustness of the impact of the hypothesized variables on the SEO announcement effect. I control for various firm-specific characteristics that the literature on SEOs suggests to have an influence on the abnormal returns. If the results presented in Table XI are not monotonic, but instead driven by subsamples of firms with extreme performance, one would expect regression analysis to embody the fragility of the relationship. Table XII presents the results from the regression models.

Convincingly, I find past 12-month stock return to have significantly positive sign after the inclusion of various control variables in all regression models. The lack of statistical significance of market-to-book is not surprising: in earlier research (see, e.g., Dierkens (1991), Denis (1994)) the linkage has been positive, but statistically insignificant. The impact of sales growth seems two-fold: the statistical significance based on the subsample analysis contradicts with the insignificant positive sign in all the regression models. The results on sales growth therefore should be interpreted as a further evidence of non-monotonic linkage between demand for capital and SEO announcement effect reported earlier by Denis (1994) in the US and Burton et al. (2003) in the UK. The SEO% (SEO volume) has expected positive sign, but controlling for firm-specific factors makes it statistically insignificant, which is not surprising as the analysis in Table XII reveals that only the highest volume subsample undergoes significantly positive returns, while the others are leveled-off. Furthermore, Appendix A reveals that at least at the macro level, SEO% is strongly positively correlated with sales growth, past stock returns and market-to-book, all of which can lower the sign of the regression estimate for SEO%. Finally, the control variables are mainly statistically insignificant, yet some of them suggest interesting relations between firm characteristics and announcement effect to exist. Moreover, investors react more optimistically to SEO announcement by dividend paying stocks than non-dividend paying stocks, and the sign of leverage remains also modestly positive. Quynh-Nhu (2009), reports similar findings with a small sample of Finnish seasoned equity offerings.

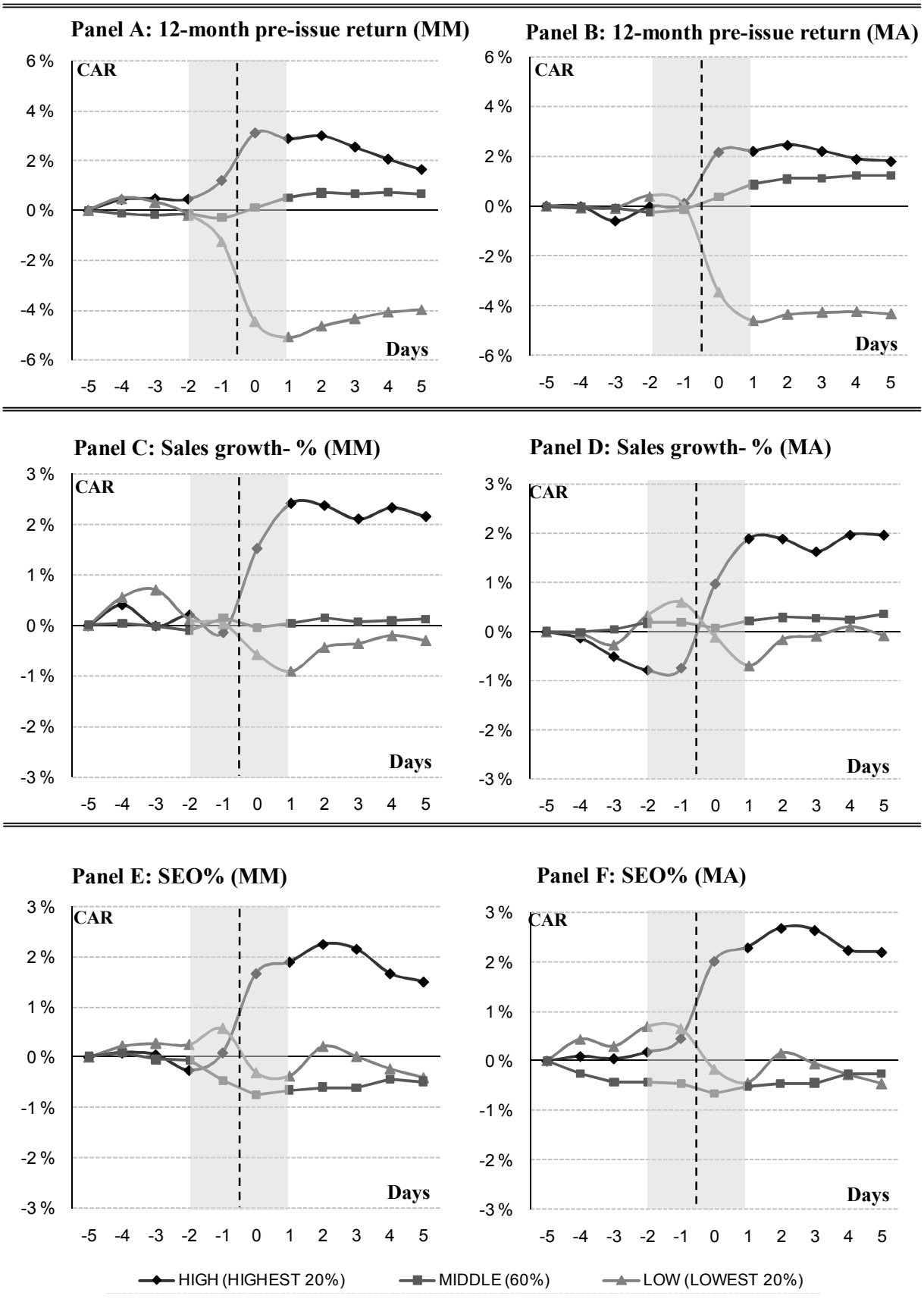

Panel A: 12-month pre-issue return (MM)
Panel B: 12-month pre-issue return (MA)
Panel C: Sales growth- % (MM)
Panel D: Sales growth- % (MA)
Panel E: SEO% (MM)
Panel F: SEO% (MA)
CAR
Days
HIGH (HIGHEST 20%)
MIDDLE (60%)
LOW (LOWEST 20%)

Figure 4: CARs of SEO firms around the announcement: the impact of issuer characteristics
The figure shows the impact of 12-month pre-issue market adjusted stock return, issuer 12-month sales growth and equity offering volume (SEO%, calculated as all UK SEOs with value over €5 million within a quarter divided by the number of listed companies at the end of previous year) on SEO firms' announcement effect. The abnormal returns are calculated using market model on the left hand side (MM) and market adjusted returns on the right (MA). All the panels show returns of the highest 20 % (black line), lowest 20 % (dim grey line) and the remaining 60 % in between (dark grey line) calculated as equally weighted sample averages. **Panels A and B** present the impact of issuer pre-issue 12-month stock return on announcement effect during [-5,+5] window, while **Panels C and D** show the impact of 12-month sales growth at the issue year during similar [-5,+5] window. **Panels E and F** show the impact of equity offering volume (SEO%) during [-5,+5] window. The sample totals 543 SEOs during a period ranging from 1999 to 2007. The grey area highlights [-1,+1] event window and the dashed line is positioned in the midpoint of the announcement date.

Figure 4 graphically presents the impact of three of the most consistent determinants of SEO announcement effect: past stock returns, sales growth and SEO volume. For robustness, the results are shown both using market model and plain market adjusted abnormal returns. Figure 4 shows that as a result of sub sampling, the only group of firms with significantly negative announcement effect is the quintile of firms with lowest stock market performance during 12-month prior to the announcement – the relationship holds using both market model and market adjusted returns (Panels A and B). On the other hand, based on the regression analysis I conclude that the impact of SEO% and sales growth is not robust and instead affected by large differences between firms in the cross-section.

Robustness check: market timing as a determinant of SEO announcement effect

The sample period of the thesis ranging from 1999 to 2007 contains IT bubble around the year 2000, and therefore reflects its consequences. The stock market underwent extreme optimism before IT bubble burst in the early 2000, when a number of technology firms sought external financing from the market by means of IPOs and SEOs. The bullish period was followed by market-wide waves of pessimism with a number of bankruptcies occurring and a large fraction of the aggregate stock market wealth vanishing. Theoretically, dramatic shifts in the market conditions can bias the results of the event study at the total sample level. So far, past stock returns seem to be an important determinant of SEO announcement effect, yet the time period employed in the thesis exposes the results to time-varying market conditions. To address the robustness of the results, I remove the outlier years from the sample and perform regression analysis.

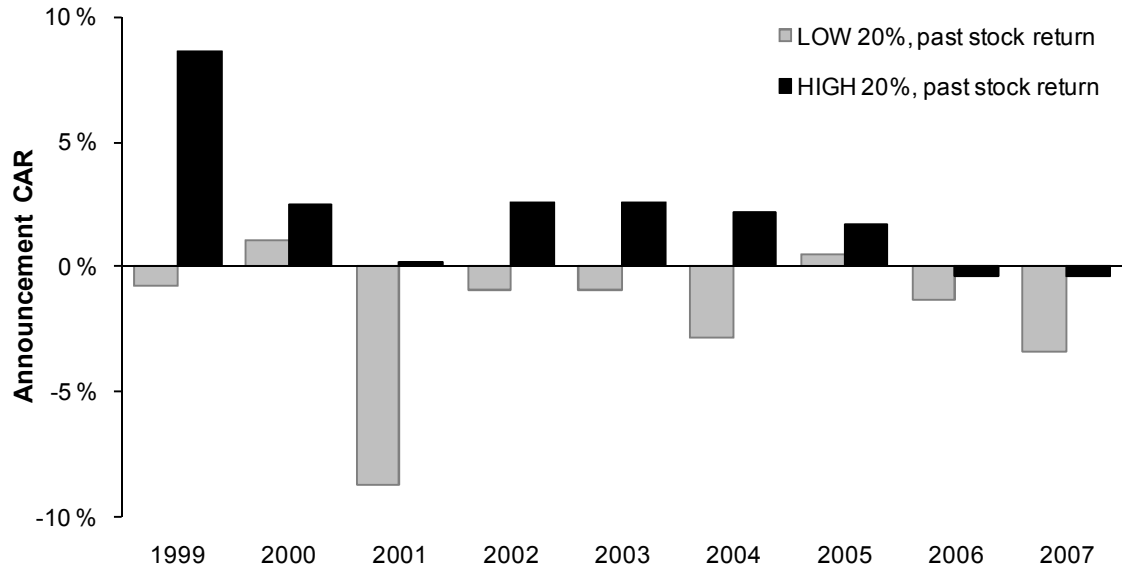


Figure 5: **The impact of past 12-month stock return on announcement effect annually during the sample period**

The figure shows the median market adjusted cumulative abnormal returns of high (20 %) and low (20 %) portfolios of SEO firms sorted by raw past 12-month stock return. Firms are sorted separately each year to analyze the impact of time on the announcement effect. 1 % of observations with highest and lowest past stock returns and CARs are excluded from the total sample respectively. The black bars represent the median CARs of 20 % of firms with highest past 12-month stock returns each year, while the grey bars represent 20 % with the lowest past stock returns. The sample totals 543 SEOs by UK firms during period 1999-2007 sourced from Dealogic. The stock data are sourced from Datastream.

Figure 5 shows the time-varying role of past 12-month stock returns as a determinant of the SEO announcement effect. In year 1999, the high stock market performers face extreme optimism around the announcement. On the contrary, in year 2001 subsequent to the IT bubble burst, low stock market performers undergo extremely low announcement returns. During the remaining sample years, the market reaction on SEO announcement is more optimistic for high performers than for low performers, while the differences between subsamples are much smaller than in years 1999 and 2001.

Table XIII
Regression analysis of announcement effect after removal of years 1999 and 2001

The table shows OLS regression estimates for determinants of cumulative abnormal returns around the announcement of SEOs. The regressions are estimated for event window of [-1,+1] days using both market model and market adjusted returns in estimation of CARs. Years 1999 and 2001 show differing announcement effect patterns and they are removed from the sample. 1 % of observations both with highest and lowest CARs and past stock returns are removed from the sample. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. Financial slack (cash and cash equivalents / total assets), Debt / Total assets, Capex / Total assets, EBITDA / Total assets, Market-to-Book, LNsales and PPE / Total assets are measured at the previous year end. Sales growth is measured in the issue year. Dividend is a dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. Past 12m stock return is the firm's 12-month raw stock return prior to the issue announcement. SENT is the level of UK consumer sentiment index in the issue month. Issue size is the total deal value divided by the previous year end market cap. SEO% is the number of SEOs in the UK within the event quarter divided by the number public companies at the end of the previous year. *T*-statistics, with heteroscedasticity consistent standard errors as suggested by White, for no relationship between dependent and independent variables are reported next to coefficients, where * and ** denote to statistical significance of the relationship at 5 % and 1 % levels respectively. F-statistics and R-squared are reported as measures of model explanatory power.

Cross-sectional OLS regression	Dependent variable: SEO announcement CAR [-1,+1] after removal of years 1999 and 2001			
	Market model [-1,+1]		**Market adjusted** [-1,+1]	
Independent variables	Estimate	*t-stat*	Estimate	*t-stat*
Past 12m stock return	0.015	*2.57**	0.017	*2.79***
Market-to-book	0.001	*0.50*	0.001	*0.57*
Sales growth	0.017	*1.26*	0.013	*0.87*
SEO%	0.870	*1.18*	1.131	*1.40*
Dividend	0.015	*1.32*	0.011	*1.00*
SENT	0.001	*0.50*	0.002	*0.62*
Issue size	0.003	*0.22*	0.007	*0.68*
LNsales	-0.004	*-1.27*	-0.003	*-1.01*
Debt / Total assets	0.030	*1.24*	0.028	*1.15*
PPE / Total assets	-0.015	*-0.94*	-0.013	*-0.81*
EBITDA / Total assets	0.007	*0.45*	0.015	*0.74*
Financial slack	0.026	*0.90*	0.019	*0.60*
R&D	0.009	*0.91*	0.015	*1.39*
Intercept	0.001	*0.02*	-0.011	*-0.22*
Year dummies		Yes		Yes
F-statistic		1.558		1.849
P-value, F-statistic		0.06		0.02*
R-squared		0.065		0.098
Number of observations		418		418

Table XIII shows regression estimates for the total sample less years 1999 and 2001. The estimated coefficients are well in line with the total period regression estimated in Table XII. In addition, the *t*-statistics of past stock returns in models employing both market model (2.57) and market adjusted returns (2.79) remain highly statistically significant. Similarly, all the other hypothesized variables of interest maintain their insignificant positive signs. Therefore, the robustness checks show that the findings on SEO announcement effect determinants are not driven by sub periods of extreme market conditions.

The analysis on announcement effect of SEOs documented in this subsection yield several conclusions. Moreover, market timing is the strongest determinant of abnormal returns as the positive impact of past stock returns persist after controlling for market-to-book ratio and various other issuer characteristics. In addition, the impact of demand for capital, proxied by sales growth during the year of the issue, appears to be positive and statistically insignificant during a three-day event period at the total sample. Nevertheless, the univariate analysis suggests that a weak association exists. Finally, the analysis on equity offering volume as a determinant of announcement return suggests that a modest linkage exists, but the relationship is driven by subsample of firms issuing during the high volume issue periods.

6.2.2 Post-issue performance

In this subsection, I present the findings on issuer long-term post-issue stock market performance. To mitigate the bad model or specification problem argued by Barber and Lyon (1997) and Lyon et al. (1999), I use both 1) FTSE All-Share index and 2) size and market-to-book matched firms as the benchmark to calculate the abnormal returns. I also test the hypotheses H_{11}-H_{13} on determinants of post-issue performance. Specifically, I employ pre-issue firm characteristics as the proxies to test the strength of market timing, demand for capital and deal size as determinants of post-issue performance.

Table XIV
SEO post-issue performance: total sample

The table shows the post-issue underperformance of seasoned equity offerings at the total sample level. The results are estimated and reported using both size and market-to-book matched firms and FTSE All-share index as the benchmarks and presented separately for [0,+24] and [0,+36] event windows. The sample of equity issues is sourced from Dealogic, while the stock data is sourced from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. 1 % with largest and smallest BHARs is sorted out from the sample. Equally weighted sample averages and proportion of positive BHARs are reported. The beginning of the event period, t=0, is set to the closing of the next trading following the issue date reported by Dealogic. *T*-statistics of no difference from zero are reported next to averages, where * and ** denote to statistical significance of the difference at 5 % and 1 % levels respectively.

Total sample of SEOs (n=543)	Post-issue BHARs					
Event window	[0,+24]			[0,+36]		
	Average	*t-stat*	% positive	Average	*t-stat*	% positive
BHAR, Match	-8.2 %	*-2.24**	47.1 %	-13.5 %	*-2.48**	44.6 %
BHAR, FTSE	-14.6 %	*-5.17***	34.7 %	-17.4 %	*-4.35***	34.3 %

Table XIV above shows that SEO firms underperform in comparison to both benchmarks during 24-month and 36-month periods of interest. The findings on post-issue performance are consistent with the earlier research on UK SEOs by Ngatuni et al. (2007) and Andrikopoulos (2009). However, my empirical results indicate that using benchmark firms matched on both market-to-book and firm size yields less negative estimates for abnormal returns (24-month BHAR: -8.2 %) as the benchmarks matched on a single criterion in the mentioned studies (24-month BHAR varies from -13.9 % to -18.0 % depending on the benchmark in Andrikopoulos (2009)). The differences between the FTSE All-Share and matching firm benchmarked abnormal returns in the cross-section are large, since 44.6 % of the firms do not underperform using matching firms, while the same figure is 34.3 % using FTSE All-Share as the benchmark. The results imply that SEO underperformance as a phenomenon partly vanishes when using well specified matching firms, but still the underperformance remains marginally statistically significant. Nevertheless, the topic has been debated extensively in the recent literature (see, e.g., Barber and Lyon (1997), Jegadeesh (2000)).

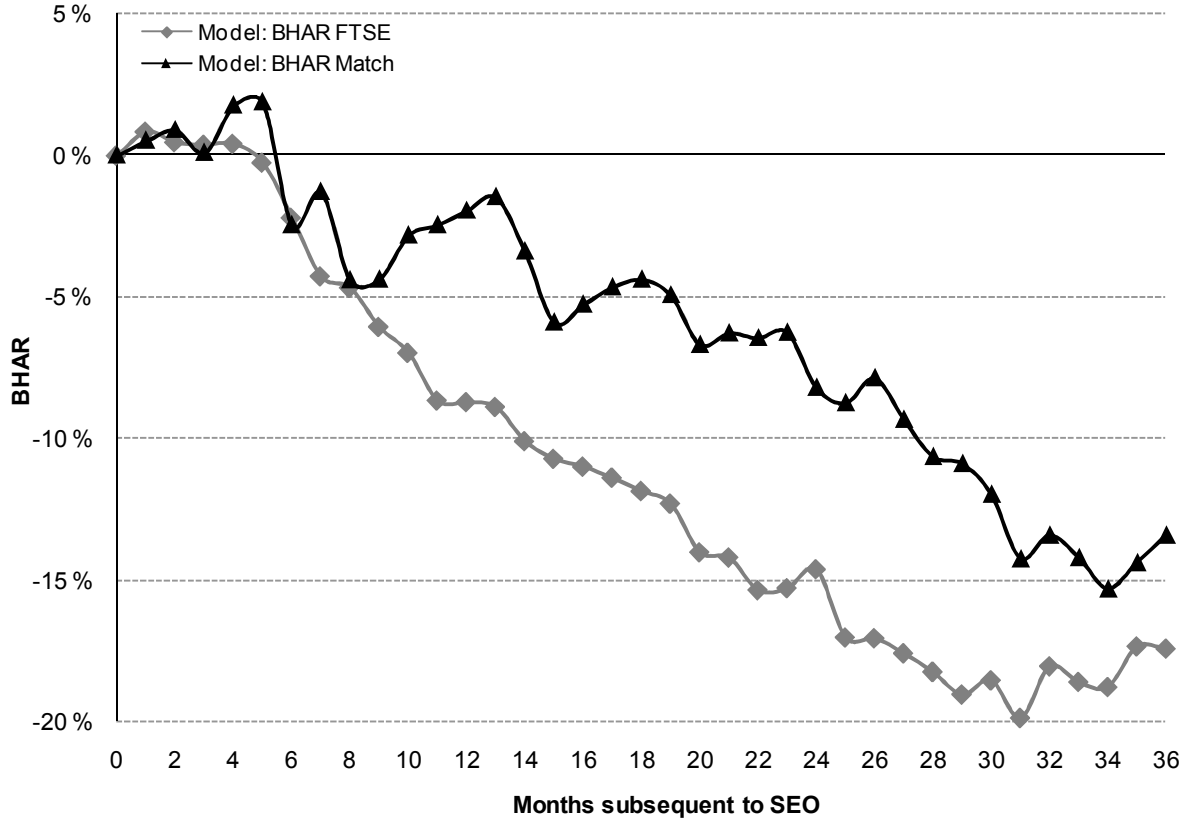


Figure 6: Buy-and-hold abnormal returns of SEO firms: post-issue period
The figure shows buy-and-hold abnormal returns for equity issuers during 36-month event period [0,+36] subsequent to an SEO. The dark line shows equally-weighted sample average BHAR using size and market-to-book matched firms as the benchmark, while the dim line employs FTSE All-Share index as the benchmark. 1 % with the lowest and highest BHARs are removed from the series. All UK SEOs with a deal value in excess of €5 million during period 1999-2007 are sourced from Dealogic making a total sample consisting of 543 SEOs. Accounting data for matching firms are retrieved from Thomson's Worldscope, while stock data are sourced from Datastream. The beginning of the event period, t=0, is set to the closing of the next trading following the issue date reported by Dealogic.

Figure 6 shows the buy-and-hold abnormal returns for the total sample of SEOs. Moreover, as can be seen from the figure, the model choice is critical to the results observed. As the equally weighted BHAR using FTSE All-Share as the benchmark yield an average 24-month return of -14.6 % the BHAR using matching firms yield an average return of -8.2 %. Both figures are statistically significantly different from zero at the conventional 5 % significance level.

Loughran and Ritter (1995) throw light on the new issues' poor performance subsequent to an issue. Since their arguments, numerous papers address the anomalous performance of the

issuers. Furthermore, two of the often noted arguments for the underperformance are successful market timing by the managers and deterioration of the operating performance following an issue. In other words, equity issues imply overvaluation or alternatively, they are actually non-events – firm specific factors explain the underperformance in the long horizon. Jegadeesh (2000) argues that investors are overoptimistic about the prospects of the new issues and realize it only in the longer term. In response to the studies on shifts in long-term operative performance, I test the impact of pre-issue characteristics on the long-term post-issue performance. I hypothesize that firms who signal overvaluation at the announcement should be poor long-term investments, while the firms who demand capital for investments or growth could theoretically use the proceeds efficiently and show less signs of underperformance. In addition, I find that at the total sample level, SEO firms underperform subsequent to the issue, and hypothesize that SEO underperformance increases with deal size. Finally, I further test whether investors can distinct between good and bad SEOs at the time of announcement.

Table XV
SEO post-issue performance: abnormal returns and issuer characteristics

The table shows the impact of issuer/issue specific factors on the post-issue stock market performance of SEO firms. Firms are sorted into quintiles or subsamples based on announcement CAR [-1,+1], 12-month raw pre-announcement stock returns, whether the company reports R&D expenditures in the fiscal year prior to the issue, sales growth during issue year, capital expenditure growth during issue year and the issue size. The *t*-test of equal means and Wilcoxon signed-rank z-test of equal medians between HIGH quintile and LOW quintile BHARs address the impact of the given factor to the post-issue performance. 1 % of observations with largest and smallest BHARs are removed from the sample. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. The beginning of the event period, t=0, is set to the closing of the next trading following the issue date reported by Dealogic. *T*-statistics and z-statistics for no difference between HIGH and LOW quintiles are reported next to coefficients, where * and ** denote to statistical significance of the difference at 5 % and 1 % levels respectively.

Post issue BHAR	Event period (months)					
Benchmark: matching firms	[0,+6]	[0,+12]	[0,+18]	[0,+24]	[0,+30]	[0,+36]
Announcement CAR [-1,+1]						
HIGH (average)	2 %	13 %	-3 %	-3 %	-14 %	-10 %
LOW (average)	0 %	-10 %	-6 %	-15 %	-23 %	-18 %
t-stat, difference	*0.28*	*2.54* *	*0.25*	*0.92*	*0.58*	*0.44*
Wilcoxon, *z-stat*	*-0.23*	*2.57* **	*0.19*	*0.25*	*-0.39*	*-0.30*
12-month raw pre-announcement stock return						
HIGH (average)	2 %	6 %	-7 %	-15 %	-28 %	-27 %
LOW (average)	-4 %	-12 %	-5 %	-10 %	-5 %	-2 %
t-stat, difference	*1.10*	*1.96**	*-0.25*	*-0.38*	*-1.42*	*-1.29*
Wilcoxon, *z-stat*	*0.84*	*1.62*	*-0.85*	*-0.73*	*-1.76*	*-1.44*
R&D expenditure						
Reports (average)	4 %	11 %	13 %	13 %	6 %	11 %
Doesn't report (average)	-2 %	-2 %	-10 %	-14 %	-18 %	-20 %
t-stat, difference	*1.53*	*2.12* *	*3.27* **	*3.04* **	*2.18* *	*2.41* *
Wilcoxon, *z-stat*	*1.57*	*2.89* **	*3.13* **	*2.69* **	*2.43* *	*2.30* *
Sales growth-%						
HIGH (average)	-13 %	3 %	-8 %	-2 %	-3 %	0 %
LOW (average)	-5 %	0 %	-21 %	-20 %	-33 %	-34 %
t-stat, difference	*-0.48*	*0.18*	*0.99*	*0.92*	*1.51*	*1.31*
Wilcoxon, *z-stat*	*0.54*	*0.90*	*0.53*	*1.59*	*1.15*	*0.60*
Capex growth-%						
HIGH (average)	0 %	15 %	1 %	-5 %	-17 %	-9 %
LOW (average)	-10 %	-9 %	-13 %	-14 %	-20 %	-24 %
t-stat, difference	*1.22*	*2.01* *	*1.23*	*0.53*	*0.13*	*0.57*
Wilcoxon, *z-stat*	*1.52*	*1.38*	*0.98*	*0.88*	*0.98*	*0.24*
Deal size						
HIGH (average)	-3 %	1 %	-2 %	-9 %	-15 %	-29 %
LOW (average)	0 %	1 %	-5 %	-7 %	-12 %	-8 %
t-stat, difference	*-0.57*	*0.04*	*0.37*	*-0.18*	*-0.22*	*-1.20*
Wilcoxon, *z-stat*	*-0.54*	*-1.01*	*-0.64*	*-0.89*	*-1.26*	*-1.60*

Univariate analysis on determinants of post-issue underperformance

Table XV above presents the equally weighted abnormal stock market performance of subsamples of size and market-to-book matched SEOs sorted by the variables of interest. The observation period ranges from six to 36 months.

i) Announcement returns

I find that the firms with the most optimistic market reaction at the announcement of the SEO are superior investments during 12-month horizon as opposed to the poorest quintile of firms at the announcement. However, the difference in BHARs between subsamples of firms converges after one year from the announcement. All in all, investors seem to have some ability to pick the best issues at the announcement.

ii) Market timing

The role of past stock returns in explaining post-issue stock market performance is two-parted: first, high pre-issue stock return firms are good investments during short horizons of six and twelve months, but they start underperforming in the longer term. Moreover, the worst performers prior to the issue seem not to underperform significantly during periods of 24 to 36 months. These findings indicate that the market timing is a strong determinant of post-issue underperformance in the UK. The found stock return pattern around SEOs is fully consistent with the literature on momentum, which explains that the strong performing portfolio of firms during the previous six months face higher abnormal returns on firm announcements and are superior short-term investments during periods of 12 months or less (Jegadeesh and Titman, 1993).

iii) Demand for capital

I employ three different proxies of demand for capital as the issuer characteristics that could explain long-term underperformance: whether firm reports research & development expenditures, issue year sales growth and issue year capital expenditures. I find strong evidence that firms who commit and report R&D expenditures are superior investments as opposed to the firms who do not report R&D expenditures. In addition, both sales growth and capital expenditure growth have hypothesized sign, yet only capital expenditure growth at 12-month period after issue has statistically significantly positive sign at 5 % level. The existing literature partly contradicts with the findings presented in Table XV. Lyandres et al. (2008) argue that SEO firms invest significantly more than their non-issuing peers and additionally, adjusting for the difference in investment explains large part of the observed

underperformance of SEOs. Lyandres et al. (2008) and Carlson et al. (2006) hypothesize that the increase in investment ultimately reduces firm risk and decreases expected return. One possible explanation for the positive linkage between capital demand proxies and BHARs is the use of matching firm technique. Using a sample of French firms, Jeanneret (2005) finds investment related SEOs to yield significantly negative abnormal returns, while using a large US sample, Autore et al. (2009) report findings that question the true form of the phenomenon. Moreover, issuers who state that the purpose of the issue is to raise cash for investment purposes perform significantly better than the other use of proceeds classes. Should the use of appropriate matches control for the differences in investment opportunities across firms, then sales growth, capex growth and R&D expenditures could be interpreted as measures of firm quality rather than investment opportunities.

iv) Issue size

I test the impact of relative issue size (measured as total deal value divided by the last year end market cap) on the post-issue stock market performance. I do not find significant relationship between issue size and issuer performance to exist. During most of the estimation windows, issuers with large deal size seem to be worse off than the small issuers, but the relation seems weak. However, the decrease in the performance of firms with large issue sizes after 12 months following an issue indicates that the large deal sizes are associated with elements of market timing attempt by the managers.

Table XVI
SEO post-issue performance: regression analysis of abnormal returns

The table shows OLS regression estimates for determinants of buy-and-hold abnormal returns following an SEO announcement. The regressions are estimated for event periods of [0,+24] and [0,+36] months using both size & market-to-book matched firms and FTSE All-Share stock index as benchmarks in estimation of BHARs. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. 24 firms have missing data items which reduce the number of observations in regressions to 519. In addition, the regressions with 36-month event period contain 393 observations. Financial slack (cash and cash equivalents / total assets), Debt / Total assets, EBITDA / Total assets, Market-to-Book, LNsales and PPE / Total assets are measured at the previous year end. Sales growth and Capex growth are measured in the issue year. Dividend is a dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. Past 12m stock return is the firm's raw stock return prior to the issue announcement. Issue size is the total deal value divided by the previous year end market cap. SEO% is number of SEOs in the UK divided by the number public companies at the end of previous year. The beginning of the event period, t=0, is set to the closing of the next trading following the issue date reported by Dealogic. 1 % of observations both with highest and lowest CARs and past stock returns are removed from the sample. *T*-statistics, with heteroscedasticity consistent standard errors as suggested by White, for no relationship between dependent and independent variables are reported next to coefficients, where * and ** denote to statistical significance of relationship at 5 % and 1 % levels respectively. F-statistics and R-squared are reported as measures of model explanatory power.

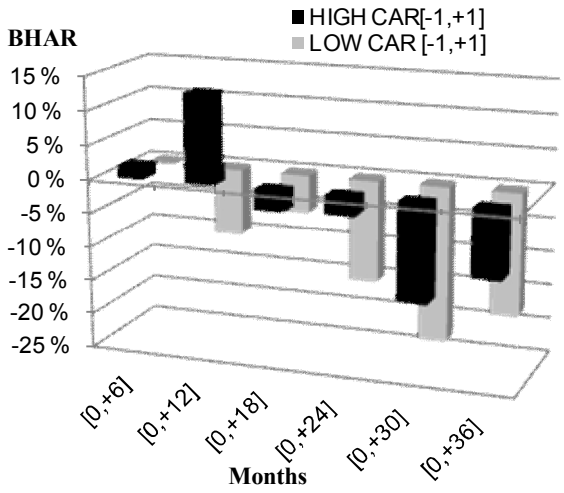
Cross-sectional OLS regression	Dependent variable: SEO post-announcement BHAR [0,+24] and [0,+36]							
	BHAR: Matching firm				**BHAR: FTSE All-Share**			
	[0,+24]		[0,+36]		[0,+24]		[0,+36]	
Independent variables	Estimate	*t-stat*	Estimate	*t-stat*	Estimate	*t-stat*	Estimate	*t-stat*
CAR [-1,+1]	1.121	*1.87*	0.250	*0.34*	1.666	*3.02***	0.826	*1.48*
Past 12m Stock return	-0.268	*-2.53**	-0.141	*-1.48*	-0.129	*-2.88***	-0.089	*-2.02**
R&D	0.108	*0.73*	0.219	*1.12*	0.052	*0.47*	0.111	*0.75*
Sales growth	0.210	*1.26*	0.172	*0.66*	0.081	*0.68*	0.202	*1.00*
Capex growth	0.052	*0.65*	0.073	*0.59*	0.007	*0.11*	0.015	*0.18*
Issue size	-0.280	*-2.98***	-0.468	*-4.49***	-0.105	*-1.69*	-0.213	*-3.02***
Market to Book	-0.017	*-1.54*	-0.018	*-1.58*	-0.029	*-2.36**	-0.031	*-2.02**
LN sales	-0.045	*-1.61*	-0.063	*-1.71*	-0.002	*-0.07*	-0.003	*-0.07*
Debt / Total assets	-0.490	*-1.76*	-0.077	*-0.20*	-0.344	*-1.66*	0.114	*0.43*
EBITDA / Total assets	-0.142	*-0.55*	-0.242	*-1.06*	0.002	*0.01*	0.092	*0.43*
PPE / Total assets	-0.320	*-1.52*	-0.227	*-0.86*	-0.017	*-0.10*	0.018	*0.10*
Financial slack	-0.093	*-0.30*	0.002	*0.01*	-0.392	*-1.35*	-0.276	*-0.78*
Dividend	0.066	*0.55*	0.199	*1.09*	-0.012	*-0.12*	0.019	*0.14*
SEO%	-0.833	*-0.12*	-9.107	*-0.99*	-9.556	*-1.55*	-12.508	*-1.53*
Intercept	0.779	*2.15**	1.158	*1.83*	0.743	*1.60*	0.639	*1.00*
Year dummies		Yes		Yes		Yes		Yes
F-statistic		2.171		1.160		2.422		1.677
P-value, F-statistic		<0.01**		0.29		<0.01**		0.03*
R-squared		0.119		0.082		0.131		0.115
Number of observations		519		393		519		393

Multivariate analysis on determinants of post-issue underperformance

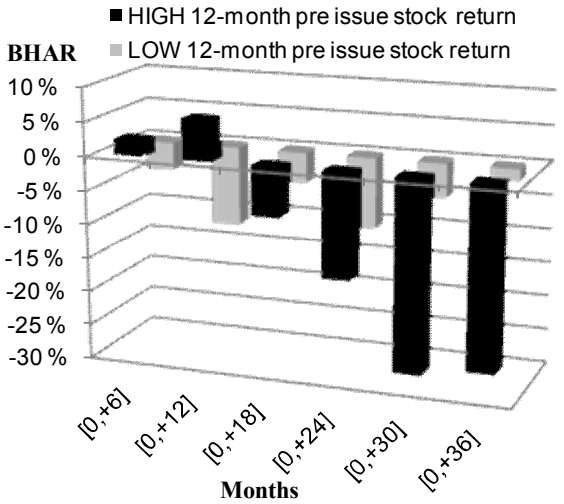
To test the robustness of the findings, I perform cross-sectional multivariate regression analysis of BHARs controlling for various issuer specific characteristics. The regression estimates are presented in Table XVI. The coefficients of both announcement CAR and past stock returns have expected sign and show statistical significance in some of the regression models. The strong negative impact of pre-issue 12-month stock return on 24-month BHAR shows that market timing hypothesis seems to explain a fraction of the post-issue underperformance after controlling for various firm specific variables suggested in the literature. Loughran and Ritter (1995) argue that market-to-book and size factors explain part of the observed abnormal returns, which suggest that the variables should be included as control variables. Moreover, I find that the two variables, namely market-to-book and LNsales, have negative and partly statistically significant relationship with the abnormal returns following an SEO.

Based on the regression estimates, the demand for capital hypothesis seems weaker in determining the abnormal returns of SEO firms than was expected based on the univariate analysis. While all the three proxies of demand for capital hypothesis have persistent positive sign, none of them has statistical significance at any of the conventional levels. A possible explanation of the modest regression estimates is the positive correlation among the three variables which weakens the regression estimates to a certain degree. The hypothesized negative impact of issue size is persistent during long holding periods as both models with 36-month estimation period yield test statistics highly significant at 1 % level. Finally, SEO volume and leverage suggest small negative relation with post-issue performance. The negative sign of the SEO volume supports the existing literature. Namely, Loughran and Ritter (1995) state that SEOs cluster into opportunistic periods, which are particularly vulnerable for long-term underperformance.

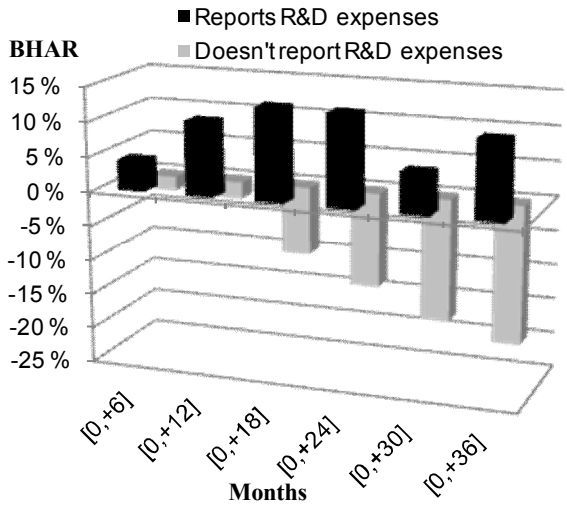
Panel A: Announcement CAR [-1,+1]



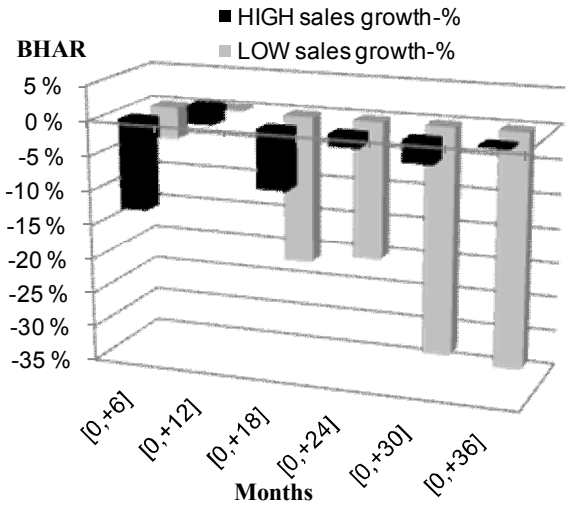
Panel B: Pre-issue 12-month raw stock return



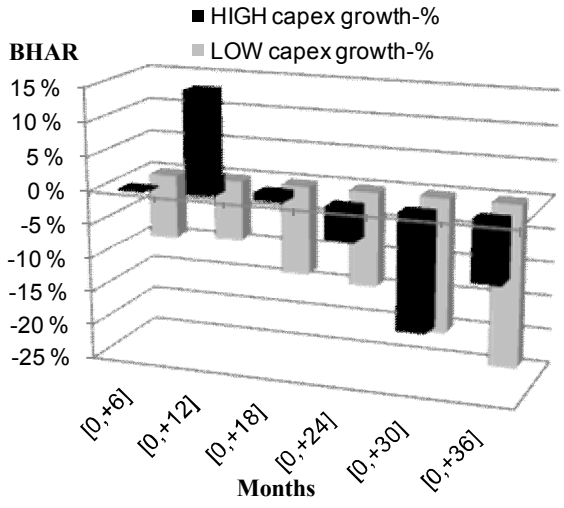
Panel C: R&D expenditures



Panel D: Sales growth- %



Panel E: Capex growth- %



Panel F: Issue size

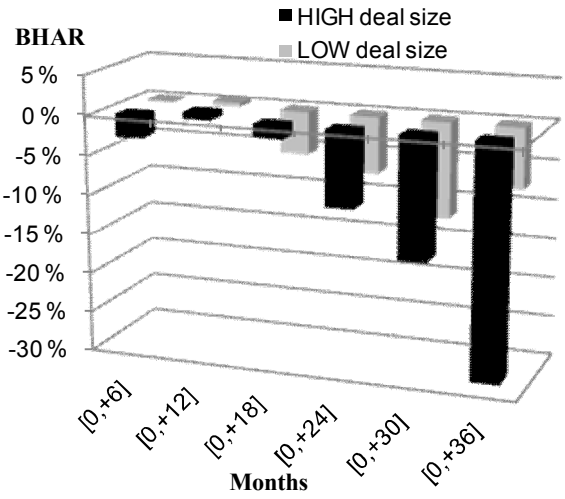


Figure 7: BHARs of SEO firms post-issue: the impact of issuer characteristics
The figure shows the impact of issuer/issue specific factors on the post-issue stock market performance of SEO firms measured as buy-and-hold abnormal returns using size and market-to-book matched firms as the benchmark. Firms are sorted into quintiles based on announcement CAR [-1,+1], 12-month raw pre-announcement raw stock returns, whether the company reports R&D expenditures in the fiscal year prior to the issue, sales growth- % during the issue year, capital expenditure growth- % during the issue year and the issue size in percentage of last year end market capitalization. 1 % with highest and lowest BHARs are removed from the series. The dark and dim bars show the equally weighted average BHAR of HIGH and LOW quintile respectively. The sample of equity issues is sourced from Dealogic, while the company financials are sourced from Thomson's Worldscope and stock data from Datastream. The sample period ranges from 1999 to 2007 and contains 543 SEOs in total. The beginning of the event period, t=0, is set to the closing of the next trading following the issue date reported by Dealogic.

Figure 7 graphically illustrates the impact of pre-issue characteristics of issuers on long-term abnormal returns post-issue. Panel B plots the impact of pre-issue raw stock return on the post-issue performance. Moreover, while strong past stock market performers seem superior investments during short horizons, they clearly start to underperform after 12 months following an issue. As described before and plotted in Panel C, the presence of research and development expenditures gives strong indication on post-issue performance. Namely, the firms reporting R&D expenditures outperform their non-issuing benchmarks, while the reverse holds for non-reporting firms. Should the SEOs underperform on average, one would expect larger deal sizes to imply more severe underperformance. Panel F plots the relationship and indicates that larger issue sizes are among the worst investments in the long-term.

The analysis of post-issue underperformance reveals that using matching firms instead of FTSE All-Share as the benchmark for normal returns considerably decreases the estimates of aggregate underperformance. At the cross-sectional level, firms with high past stock returns and large issue size seem to be poor investments at the longer term. Various proxies on demand for capital indicate positive relation with post-issue performance. However, based on the regression analysis, none of capital demand proxies has a robust statistically significant relationship. All in all, the findings indicate that investors are worse off when participating in market timing driven SEOs as opposed to the issues by high demand for capital firms, who can put the proceeds into efficient use.

Table XVII
Summary of findings on issuer stock market performance

The table pools together the hypotheses on stock market performance of the SEO firms around the announcement as well as in the post-issue period, the proxy variables employed in the tests and the empirical findings on the hypotheses. The "+" (positive linkage) and "–" (negative linkage) signs after the hypotheses address the theoretical prediction of the relationship between each class of hypotheses and the abnormal stock market performance. The column on the right indicates whether the hypothesis ought to be accepted based on the empirical findings.

Summary of findings: issuer stock market performance		
SEO announcement effect: ex ante firm/issue characteristics determining the announcement effect		
Hypotheses & prediction	Proxies	Accepted/Rejected
H_8: SEO volume (+)	Quarterly number of SEOs / number of listed firms	Weak support
H_9: Demand for capital (+)	Sales growth-%	Weak support
H_{10}: Market timing (+)	Market-to-book, past 12m stock return	Accepted
Long-term performance: ex ante firm/issue characteristics determining the post-issue performance		
H_{11}: Market timing (-)	Pre-issue 12m stock return	Accepted
H_{12}: Demand for capital (+)	R&D expenditure, Capex growth-%, Sales growth-%	Weak support
H_{13}: Issue size (-)	Total proceeds / previous year end market cap	Accepted

To pool together the various tests and hypotheses on issuer stock market performance, Table XVII summarizes the major findings and documents the proxies used to test hypothesized relations. The role of market timing hypothesis seems strong in explaining announcement effect, while the momentum firms continue to perform strongly during periods of less than 12 months following the issue. Yet, as hypothesized, the market timers turn out to be poor investments during periods over 24 months. Larger issue sizes also perform poorly at the long horizon, which can possibly reflect the fact that some firms exploit market timing by issuing more capital than they can actually put into efficient use. The hypothesized positive linkage between SEO volume and announcement effect is driven by subsample of firms that time their issues for high SEO volume periods, while the evidence on demand for capital as a determinant of announcement return seems much the same. Finally, various proxies on demand for capital indicate that firms who can invest the issue proceeds in positive NPV projects can avoid post-issue underperformance.

7 CONCLUSION

The thesis was motivated by lacking understanding of various SEO mechanisms in the UK as concluded by Andrikopoulos (2009), who show that SEO firms post-issue operating performance deteriorates following the issue. The limited empirical evidence on UK SEOs motivates an investigation of various SEO phenomena from the perspective of the traditional theories on firm financial policy. In addition, inspired by the recent unpublished working paper on macro determinants of SEOs by Howe and Zhang (2009), which to my best knowledge is the first attempt to study the phenomenon from multiple theories' perspective, I provide new evidence and deepen the understanding on drivers of SEO cycles.

This thesis studies various financial theories' impacts on the equity offering decision and their consequences on SEO firms' stock market performance. In the first empirical section 6.1, I employed UK data sample to 1) analyze the macro determinants of SEOs and 2) to distinct between different micro level determinants of SEOs. In section 6.2, I additionally 3) analyze the determinants of issuer announcement effect and 4) investigate the impact of firm-specific ex ante characteristics on the issuer post-issue performance. At the macro level, I investigated the drivers of fluctuation in seasoned equity offering volume using data for period 1994 to 2008 including 2,670 SEOs by UK firms listed in the London Stock Exchange. At the cross-sectional level, I analyzed the determinants of equity vs. debt issue choice by using 423 firm years with an SEO and 1,096 firm years with a debt issue during period from 1999 to 2007. Finally, I studied the impact of firm-specific pre-issue accounting and stock market variables on the abnormal returns of issuers around the announcement and in the long-term using data on 543 SEOs during period from 1999 to 2007.

At the macro level, I report both demand for capital and market timing conditions to have a strong impact on the SEO volume. Equity offering volume increases along with aggregate sales growth prospects of public firms and decreases with rising risk-free rate. Similarly, past stock market returns positively affect SEO volume, while the future stock returns have negative, but less clear linkage. At the cross-sectional level, much of the same patterns exist, while I also find firms with high leverage and research and development expenditures to choose issuing equity over debt. SEO announcement effect is positively affected by past stock returns, and to some extent by sales growth and SEO volume, all the findings being in line

with the predictions of the adverse selection models. Finally, firms with high past stock returns perform strongly during short periods following an issue, but turn out to be poor investment during periods of 24 or 36 months. On the contrary, firms with demand for capital and research and development expenditures appear to be good investments post-issue. Firms with large issue sizes underperform considerably more than firms with small issues, who actually experience only modest underperformance. Table XVIII below summarizes the empirical evidence to support the hypotheses tested in the thesis.

Table XVIII
Summary of findings

Hypothesis		Empirical evidence
Macro determinants (multivariate OLS regressions in section 6.1)		
H_1	*Macro volume of SEOs increases with market timing.*	Strong evidence. Past (t = 2.73) and future returns (t = -3.81) on FTSE All-Share index are statistically significant at 1 % level.
H_2	*Macro volume of SEOs decreases with asymmetric information.*	Weak support. Market volatility is negatively associated with SEO volume (t = -2.62), while analyst dispersion does not have explanatory power.
H_3	*Macro volume of SEOs increases with demand for capital.*	Strong evidence. Both future aggregate sales growth (t = 3.83) and interest rates (t = -4.51) are highly significant at all conventional levels.
H_4	*Macro volume of SEOs increases with investor sentiment.*	No support for H_4 found.
Micro determinants (multivariate logit regressions in section 6.1)		
H_5	*The likelihood of an SEO relative to a debt issue increases with market timing.*	Strong evidence. Past 12-month stock returns are persistently significant at 1 % level, while also the estimates for M / B and post-issue stock returns support the hypothesized relationship.
H_6	*The likelihood of an SEO relative to a debt issue decreases with asymmetric information.*	Strong evidence. Both analyst coverage (t = 2.62) and leverage (t = 3.59) are persistently statistically significant in various multivariate models.
H_7	*The likelihood of an SEO relative to a debt issue increases with demand for capital.*	Strong evidence. Sales growth (t = 2.51) and R&D dummy variable (t = 3.97) are positively associated with the equity issue likelihood.
Announcement effect (univariate subsample analysis and multivariate OLS regressions in section 6.2)		
H_8	*SEO announcement return increases with SEO volume.*	Weak support. Univariate analysis reveals that the highest subsample of hot period issuers undergo positive announcement returns (2.2 %, t = 2.42), yet multivariate analysis shows that results are non-monotonic.
H_9	*SEO announcement return increases with demand for capital.*	Weak support. The role of sales growth seems persistent based on the univariate analysis, but weakens after controlling for issuer specific factors.
H_{10}	*SEO announcement return increases with market timing.*	Strong evidence. The role of past 12-month stock return is persistent in univariate analysis (HIGH - LOW difference 5.5%, t = 3.75), multivariate regressions (t = 2.93) and persists in robustness checks (t = 2.57).
Post-issue performance (univariate subsample analysis and multivariate OLS regressions in section 6.2)		
H_{11}	*SEO long-term underperformance increases with market timing.*	Strong evidence. High past stock return firms are good investments during short periods, but underperform during longer periods (24m: t = -2.53)
H_{12}	*SEO long-term underperformance decreases with demand for capital.*	Weak support. Sales growth, R&D and capex growth all seem to be positively related to the post-issue performance, yet none of them is significant in multivariate regressions.
H_{13}	*SEO long-term underperformance increases with deal size.*	Strong evidence. All analyses indicate that large issues perform poorly the longer the holding period (36m: t = -4.49).

The purpose of the study was to investigate the timing of equity issues, which firm types are likely to issue equity and finally, which issues can be value adding to investors. A better understanding of SEO determinants can proceed into valuable insights – both from academics and practitioners perspectives. Furthermore, the post-issue underperformance reported by Loughran and Ritter (1995), and reaffirmed in this thesis, does not imply that all SEOs are bad investments as such, but in fact accentuates the importance of understanding why sometimes an SEO could be interpreted as a sale signal, and at other times a positive indication of the firm's future. A possible implication of the findings is that an investor, who can distinct between market timing driven and demand for capital driven SEOs, is able avoid post-issue underperformance's adverse wealth effects by only holding on to stocks of firms who can signal their rationale for the use of issue proceeds. On the contrary, the findings on issuer stock market performance suggest that investing in SEOs of firms with high past stock returns who issue relatively large amount of equity can be hazardous for shareholders' wealth.

The relatively large transaction costs of external capital issues suggest that ex ante shareholders benefit from the SEOs only when 1) firm is trading above its intrinsic value or 2) positive NPV projects (in excess of cost of capital and transaction costs) exist and internally generated capital is not available. Therefore, following shareholders' interest guides the firm directly to issue equity due to one of the two mutually non-exclusive motives: market timing or demand for capital. The empirical findings indicate that both market timing theory of equity issuance and demand for capital theory are present at all levels of SEOs: macro, micro and as determinants of stock market performance around the issue. All in all, while the theoretical arguments for the existence of various motives for seasoned equity offerings are clear, investors' wealth considerations necessitate a better understanding of market timing, demand for capital and the other prominent theories of security issuance. Clearly, potential investors need to understand why the firms in the first place issue equity, to be able adjust valuations to the level of firms' intrinsic value.

Despite SEOs being among the most researched topics in the corporate finance literature, gaps to fill still exist. Behavioral aspects of corporate finance are clearly one such area. Moreover, Baker et al. (2005) discuss the various aspects of behavioral corporate finance. They conclude that while it is clear investor sentiment is present in the stock market and in firm financial policy, the correct specifications to measure and quantify its consequences are under a debate. Moreover, measuring investor sentiment at cross-sectional level would open up room for

further investigation of SEO determinants and perhaps more interestingly, enable quantifying its consequences on the stock price mechanics around seasoned equity offerings.

Countries are different in terms of the role of financial institutions as stock market investors. Similarly, some firms are mainly held by financial institutions, while others are dispersely held by households and other investor groups. Quantifying the micro level impact of ownership structure or the macro level institutional setting of the country on the stock market performance of equity issuers would be of high interest. Jenter (2005) points out that SEOs coincide with insider selling. Moreover, the stock price implication of insiders' transactions around SEO announcements provides an interesting topic for future research.

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APPENDICES

Appendix 1: Sample collection process of non-SEO control sample for logit regression

Collection of the non-SEO control sample employed in the model (5) in micro determinant logit regression

Step	**N**	**Source**
(1) Total number of listed firm years, 1999-2007	15,546	*Worldscope*
(2) Less firm years with an SEO, 1999-2007	1,693	*Dealogic*
(3) Total number of listed firm years with no SEO	13,853	
(4) Less firm years with data items missing	4,723	*Worldscope*
(5) Final control sample	9,130	

Note: Number of firm years with an SEO is smaller than the initial sample of SEOs sourced from Dealogic, since multiple issues by a single issuer during a calendar year is treated as a single firm year with an SEO

Appendix 2: Correlation coefficients: macro level determinants

SEO% is the total number of UK SEOs in a given quarter divided by the number of listed companies at the end of the previous year. Stdev is the daily standard deviation of FTSE All-Share index within a quarter. Analyst dispersion is the weighted average standard deviation of analyst recommendations on FTSE 100 index companies at the end of the preceding quarter. GDP is the UK GDP growth from 1 quarter before to 2 quarters after the given quarter. Sales is the average sales growth of all UK listed companies from 1 quarter to 4 quarters following the given quarter. Int. is the average LIBOR rate from 4 quarters prior to 1 quarter prior to the given quarter. SENT is the level of UK consumer sentiment in the quarter. M/B is the median market-to-book of all UK listed companies. Mret, pre is the return on FTSE All-Share index from four quarters to one quarter prior to the given quarter. Mret, post is the return on FTSE All-Share index from one quarter to four quarters following the given quarter.

Correlation coefficients between macro-level variables

	SEO%	Stdev	Analyst	GDP	Sales	Int.	SENT	M/B	Mret, pre	Mret, post
SEO%	*1.00*									
Stdev	-0.42	*1.00*								
Analyst	0.08	-0.43	*1.00*							
GDP	0.06	-0.38	0.10	*1.00*						
Sales	0.36	-0.40	0.11	0.46	*1.00*					
Int.	-0.16	0.05	-0.24	0.07	0.29	*1.00*				
SENT	0.05	-0.18	0.13	0.41	0.55	-0.03	*1.00*			
M/B	0.27	-0.61	0.25	0.43	0.55	0.29	0.29	*1.00*		
Mret, pre	0.47	-0.49	0.19	0.36	0.65	0.24	0.36	0.72	*1.00*	
Mret, post	-0.17	-0.30	0.25	0.24	0.23	-0.09	-0.01	0.20	0.19	*1.00*

Appendix 3: Correlation coefficients: micro level determinants

VOL is stdev of firms' daily stock return measured from 250 trading days before the issue to 50 trading days before the issue. ANA is analyst coverage dummy variable gets value of 1 if the firm is followed by one or more analysts, and value of 0 otherwise. PRE and POST stock returns are calculated as the firm's raw returns for the 12-month period prior to and following an issue. DIV is a dividend dummy variable that gets value of 1 if firm's dividend payout ratio is 20 % or higher and value of 0 otherwise. R&D is a research and development dummy variable that gets value of 1 if the firm reports R&D expenditures and 0 otherwise. Slack (cash and cash equivalents / total assets), LEV (Debt / Total assets), INV (Capex / Total assets), ROA (EBITDA / Total assets), M / B, SIZE (LNsales) and TNG (PPE / Total assets) are measured at the previous year end. GRO (Sales growth) is measured in the issue year.

Correlation coefficients between issuer characteristics, equity and debt issuers

	VOL	ANA	Slack	LEV	M / B	INV	GRO	Stock PRE	Stock POST	TNG	DIV	R&D	ROA	SIZE
VOL	*1.00*													
ANA	-0.09	*1.00*												
Slack	0.08	-0.38	*1.00*											
LEV	0.11	-0.08	0.14	*1.00*										
M / B	-0.12	0.09	-0.07	0.06	*1.00*									
INV	0.06	0.26	-0.25	0.02	0.11	*1.00*								
GRO	0.00	0.02	0.03	-0.07	0.03	0.31	*1.00*							
Stock PRE	0.05	-0.05	0.03	-0.02	-0.10	-0.15	0.02	*1.00*						
Stock POST	0.08	-0.28	0.34	0.60	-0.04	-0.16	-0.03	0.10	*1.00*					
TNG	0.24	-0.19	0.06	-0.04	-0.21	-0.10	0.00	0.09	0.04	*1.00*				
DIV	0.09	0.14	-0.14	-0.08	-0.02	0.13	-0.01	-0.03	-0.12	-0.05	*1.00*			
R&D	0.21	-0.07	-0.03	0.09	-0.11	0.11	0.12	0.02	0.04	0.32	0.00	*1.00*		
ROA	0.49	-0.15	0.18	-0.03	-0.23	-0.10	0.01	0.08	0.04	0.36	0.14	0.32	*1.00*	
SIZE	-0.14	0.20	-0.17	-0.04	0.08	0.11	-0.17	-0.15	-0.16	-0.33	0.14	-0.27	-0.18	*1.00*

Appendix 4: The sample of SEOs by industries

The table presents the seasoned equity offerings by industries. The distribution of SEOs is shown separately for macro determinants sample and for the issuer stock market performance sample. The classification of industries is based on general industry groupings (GIG) as reported in Dealogic database. The number of issues by industry and the %-share of total sample are shown separately.

Seasoned equity offerings by industries

	Macro determinants sample (n=2,670)		**Stock market performance sample (n=543)**	
	Number of issues	% of total sample	Number of issues	% of total sample
Aerospace	2	0.1 %	2	0.4 %
Agribusiness	5	0.2 %	4	0.7 %
Auto/Truck	42	1.6 %	6	1.1 %
Chemicals	29	1.1 %	7	1.3 %
Computers & Electronics	390	14.6 %	92	16.9 %
Construction & Building	122	4.6 %	30	5.5 %
Consumer Products	47	1.8 %	10	1.8 %
Defense	12	0.5 %	5	0.9 %
Dining & Lodging	54	2.0 %	8	1.5 %
Finance	318	11.9 %	47	8.7 %
Food & Beverage	48	1.8 %	13	2.4 %
Forestry & Paper	8	0.3 %	5	0.9 %
Healthcare	233	8.7 %	60	11.0 %
Holding companies	13	0.5 %	4	0.7 %
Insurance	91	3.4 %	18	3.3 %
Leisure & Recreation	109	4.1 %	18	3.3 %
Machinery	23	0.9 %	6	1.1 %
Metal & Steel	21	0.8 %	1	0.2 %
Mining	161	6.0 %	25	4.6 %
Oil & Gas	169	6.3 %	30	5.5 %
Professional Services	253	9.5 %	68	12.5 %
Publishing	73	2.7 %	9	1.7 %
Real Estate & Property	133	5.0 %	29	5.3 %
Retail	66	2.5 %	8	1.5 %
Telecommunications	156	5.8 %	21	3.9 %
Textile	7	0.3 %	2	0.4 %
Transportation	45	1.7 %	7	1.3 %
Utility & Energy	39	1.4 %	8	1.5 %
Total	2,670	100.0 %	543	100.0 %

Appendix 5: Definition of data items employed

Financial data items employed	
Macro variables	
Interest rate (3-month avg.)	DS: UKESEFI3R
GDP	DS: UKOEXP03D
Consumer sentiment index	DS: UKCNFCONQ
Sales growth-%	All UK listed firms in the LSE, calculation same as below
Market-to-book	All UK listed firms in the LSE, calculation same as below
Micro variables	
Analyst coverage (dummy)	IBH.NbrRecommendationsSell/Underperform/Hold/Buy/Strongbuy
Debt / Total assets	WS.TotalDebt / WS.TotalAssets
Sales growth-%	WS.Sales1YrGrowth
R&D (dummy)	WS.ResearchAndDevelomentExpense
Capex / Total assets	WS.CapitalExpendituresCFStmt / WS.TotalAssets
Market-to-book	DS.CommonSharesOutstanding * DS.PriceClose / WS.TotalCommonEquity
EBITDA / Total assets	WS.EarningsBeforeIntTaxesAndDepr / WS.TotalAssets
Dividend (dummy)	WS.DividendPayout
Financial Slack	WS.CashAndCashequivalents / WS.TotalAssets
LnSales	LN(WS.Sales)
PPE / Total assets	WS.PropertyPlantAndEquipment / WS.TotalAssets
Issue size	Deal Value Euro (Dealogic) / DS.CommonSharesOutstanding * DS.PriceClose

DS = Datastream, WS=Worldscope, IBH=IBES History