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THE ROLE OF PROSPECTUSES AND GUARANTEES IN RIGHTS ISSUES

An event study on market reaction to SEO prospectus filings in Sweden.

PATRIK LUNDELL^Λ

GUSTAF SOLDAN PATRIKSON^Φ

ABSTRACT

Seasoned equity offerings have been found to affect share prices dissimilarly depending on institutional differences. Much research has concerned itself with the choice of disparate flotation methods which seemingly affects firm value, as well as market reactions to SEO announcements. This event study of rights issues in Sweden during the period 2007-2012 examines the prospectus release, a formal filing date on which all issue terms are finalized and made public. By studying this date as opposed to the first announcement of an SEO, on a market characterized by an incremental release of information, this paper effectively examines another phenomenon altogether. Investors' expectations are built up during the weeks leading up to the prospectus and are then confirmed or corrected, causing a reaction. We find no unilateral movement on publication, but significant movements occur before and after, upwards and then downwards, suggesting an overreaction pattern. We also find that firms with fully guaranteed issues strongly outperform other firms on prospectus publication and over the following four-month-period.

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Λ patrik.cv.lundell@gmail.com

Φ gustafsoldan@gmail.com

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1. INTRODUCTION

Firms who would like to raise additional capital can do so by taking on debt, issuing new equity or selling hybrid securities. Much research has concerned itself with the choice of disparate flotation methods as this seemingly affects firm value. Market reactions to the issuance of new equity in publicly traded companies, known as *seasoned equity offerings* (SEOs), have been particularly pronounced and differ substantially across countries. Empirical evidence from the US, Canada and Australia has shown negative returns to SEO announcements, while Norway, Japan, Korea and Finland experience a positive effect. These opposing findings have been attributed to numerous theoretical frameworks and much of the variation is thought to stem from institutional differences. The Swedish SEO process is characterized by preliminary releases of issue terms leading up to the publication of an issue *prospectus* – a mandatory marketing document containing all the final terms of an SEO. This thesis will investigate market reactions surrounding the publication of prospectuses by means of an event study on Swedish data during the period 2007-2012. To our knowledge no study has been done on this particular date, as previous research has focused on the first announcement of an offer. This date is made more interesting by the distinct price movements that have been observed surrounding it. In addition to the overall reaction the effect of *guarantees* is studied, as this service is thought to mitigate the negative effects related to SEOs.

Since unsuccessful offerings can be very costly, many firms choose to enter into guarantee agreements whereby individuals or firms commit to purchase certain percentages of the issue. By disclosing their private valuation of the company and substantiating it by taking on risk, guarantors provide investors with a ‘second opinion’ which is thought to be a positive signal. Guarantees can be of two types, normally the term refers to an *underwriter* agreeing to cover unsubscribed stock should any remain at the end of the SEO subscription period, for which a fee is paid to compensate for the risk. As a complement to underwriting, major shareholders in Sweden often promise to subscribe to their pro rata share or more of the issue without compensation, henceforth referred to as *shareholder commitments*.

To test the impact of guarantees and study the overall market reaction to prospectuses, data on 90 rights issues in Sweden over the period 2007-2012 is used and abnormal

returns are estimated using a market model approach. These are averaged over firms and aggregated over several days to create *cumulative abnormal returns* (CARs) which are used to test the null hypothesis of no unilateral market response during three consecutive event windows: (1) the two-day prospectus publication, (2) a five-day period before, and (3) a five-day period after the prospectus. To test for the effect of guarantees the data set is split into two subsamples consisting of 52 and 38 observations respectively: the former including all fully guaranteed issues (either through underwriting or shareholder commitments, or a combination thereof) and the latter containing all remaining offerings. For completeness, a supplementary regression analysis is provided that attempts to explain cross-firm variation.

We find average cumulative abnormal returns for the five days preceding and following the prospectus date, significant at the 1% level; first an increase of 2.9% and then a decrease of -7.3%. The two-day prospectus publication window sees an average CAR of 0.6%, which is not statistically significant. For our subsample of fully guaranteed issues, the average prospectus window CAR is 1.8% and statistically significant at the 5% level. Comparing the means, fully guaranteed issues experience higher returns on the prospectus publication by between 2.3% to 3.3% with 99% confidence. Furthermore, we observe fully guaranteed offerings in our sample to strongly outperform the remainder of issues over a 140-day period, generating a gap of more than 20% in indexed returns.

The remainder of this thesis is structured as follows: In Section 2, the institutional setting in Sweden is described in greater detail. Section 3 summarizes previous literature, separated into theory and empirical research. Section 4 describes the time series and cross-sectional data set while Section 5 presents the methodology and potential sources of bias. All results are listed in Section 6 and are discussed in Section 7. Conclusions from these results are then presented in Section 8 at the end of the thesis.

2. INSTITUTIONAL SETTING IN SWEDEN

2.1 SEASONED EQUITY OFFERINGS

The Swedish market is characterized by a strong prevalence of *rights issues* as opposed to other forms of public SEOs.¹ In a rights issue, warrants (also known as *subscription rights*) are distributed to current shareholders pro rata to their ownership. Depending on offering terms, the subscription rights allow their holder to purchase a given number of newly issued shares. The rights themselves are publicly traded and may be sold to other investors in order to compensate shareholders who don't wish to subscribe to the issue for the dilution incurred. Swedish corporate law dictates (*Aktiebolagslagen* 1975:1385) that a rights issue must be formally admitted at the Annual General Meeting (AGM) or at an Extraordinary General Meeting (EGM). However, the AGM/EGM may give a mandate to the Board of Directors (BoD) to initiate rights issues at its discretion, as long as this does not interfere with the company's Articles of Association.

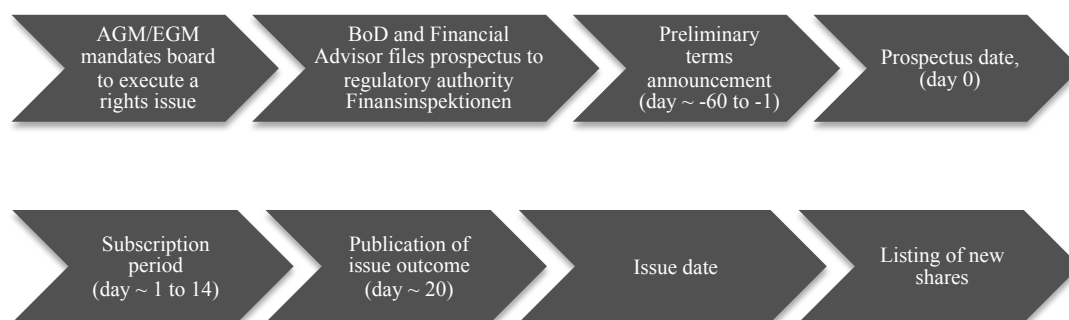
Prospectuses are required to be formally admitted by the Swedish Financial Supervisory Authority (SFSA, in Swedish *Finansinspektionen*) before publication. Anecdotal evidence shows that prospectuses are rarely complete surprises as companies often choose to publish preliminary offering terms such as discount, issue size and certain guarantee details prior to the prospectus release date. There may also be an announcement following an AGM/EGM decision to execute a rights issue. In any event, the amount of preliminary information released differs significantly on a case by case basis. Determining on what date different pieces of information are incorporated into share price is therefore difficult and likely to lead to problems in comparability across observations and studies.

The main event window surrounding which we have studied abnormal returns, is a clearly defined date on which the prospectus (including all final issue terms) is published. In this sense, the irrevocability of the prospectus may confirm investor uncertainty and constitute new information even if all terms of the prospectus have been disclosed beforehand. Informational value in prospectuses may also stem from 'soft' information; firm prospects, risk factors, and market conditions are all mandatory

¹ 87% of all public SEOs in Sweden 2008-2010 were rights issues (Finansinspektionen, 2011).

elements of the document (Finansinspektionen, 2012). Figure 1 illustrates the general stages of the rights issue process in Sweden.

Figure 1 – General outline of rights issue process



2.2 SUBSCRIPTION GUARANTEES

The service of underwriting has been suggested to mitigate the negative effects related to SEOs. The prevailing method for underwriting in the United States entails issuing equity and selling it to a group of underwriters (usually the same entities that provide financial advice for the issuance process) who then attempt to sell the shares to the public. The underwriters themselves are then at risk of ending up with any remaining stock, a practice dubbed *firm commitment underwriting*. In Europe the far less expensive method of rights issues is almost exclusively employed. This is coupled with *standby underwriting*, whereby management along with the financial advisor labor to find investors willing to guarantee to cover certain portions of the offering should they remain unsubscribed. As with the US method, investment banks often underwrite parts of the rights issues for which they have provided financial advisory. As a complement to underwriting, major shareholders in Sweden often provide a similar service by promising to subscribe to their pro rata share or more of the issue without compensation. By demonstrating their continued confidence in and commitment to the firm, shareholder commitment provides a similar signaling effect to that of underwriting.

3. PREVIOUS LITERATURE

This section is divided into three parts: first, we present theoretical explanations for stock market reactions to the announcement of SEOs; second, we explain underwriting theories; and third, we list a summary of empirical research for international markets and comment on the implications of institutional differences.

3.1 THEORY ON SEO ANNOUNCEMENT RETURNS

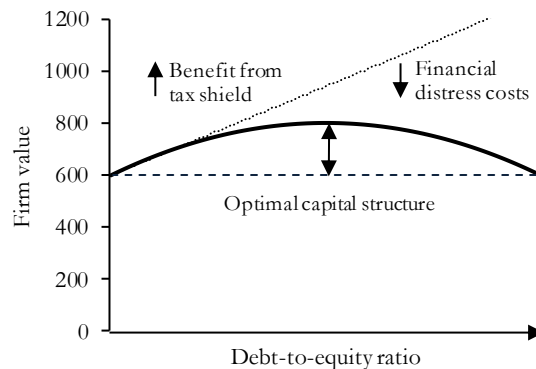
The purpose of this study is not to test specific announcement theories, but to make empirical observations on Swedish market reaction to the prospectus. Numerous and diverse theories have addressed SEO announcements and while the predictions they make for announcement day returns vary and even oppose each other, the overall impression is that SEOs are negative signals. It should be noted that theory in large focuses on the indirect effect of offerings rather than the *intrinsic value* of the investments which will be undertaken with the issue proceeds. Characteristics of the individual investment opportunity constitute the primary impact on firm value, and is likely to account for most of the variation in announcement returns, why theories are only able to explain secondary (and lesser) effects. As we study prospectus dates and not announcement dates, the following theories are not entirely applicable to our research setting since preliminary pre-event information releases habitually occur, but remain the closest substitutes available.

3.1.1 CAPITAL STRUCTURE THEORY

According to Modigliani & Miller (1958), the value of a firm in imperfect markets may be increased by a larger portion of debt in relation to equity, as tax shields arise from debt financing. For a rights issue the opposite effect would then follow, as newly issued equity lowers the overall gearing of the company. Anticipating this, investors will adjust their valuation and share price should drop accordingly. However, for highly indebted companies who are in a situation of financial distress, the debt burden may be lowering firm value (Stiglitz, 1969). Therefore, the announcement of an SEO could instead increase firm value as financial distress and business erosion costs are anticipated to diminish with more equity in the firm. A graphical representation of this is shown in Graph 1.

Graph 1 - Capital structure theory

Optimal capital structure is the tradeoff between tax shield benefits and financial distress costs.



Furthermore, Masulis (1983) argues that well-informed managers who possess valuable insider information regarding future cash flows are at all times able to choose the optimal gearing for the firm by estimating positive and negative effects from additional debt or equity. Under this line of reasoning, the announcement of an SEO indicates that there has been a downward adjustment in cash flow expectations, which should also put negative price pressure on the stock.

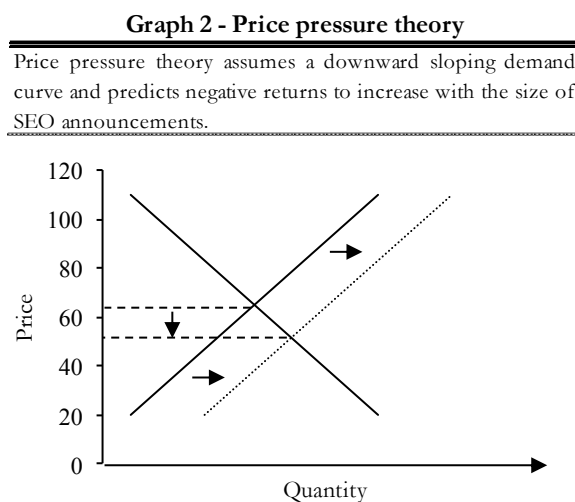
Despite being well motivated, variations of the capital structure theory do not seem to hold in practice. Eckbo & Masulis (1992) find no significant evidence that an effect from gearing takes place in a cross-sectional regression study on 1,139 SEOs in the U.S. during the period 1963-1988.

3.1.2 PRICE PRESSURE THEORY

The price pressure theory (illustrated in Graph 2), labeled by Scholes (1972), addresses supply and demand effects of an equity issue. The theory posits that if characteristics and risk factors vary enough between securities to make each asset unique, cross-security demand should be inelastic.² Individual stocks would then have a downward sloping demand curve similar to that of 'normal' goods and an increase in the supply of equity through an SEO can only succeed if new shares are offered at a discount which in turn devalues existing stock. Therefore, large issues should *ceteris paribus* lead to negative returns on announcement. Should prices instead solely be determined by risk and expected return, the opposite would be true and the demand curve be horizontal. Any

² I.e. a price change in the shares of one firm will not affect the demand for shares in other firms

change in supply would not affect demand or market prices, and no abnormal returns would be observed on SEO announcements.



3.1.3 ASYMMETRIC INFORMATION THEORY

Opportunism

Equity issues are troubled by an asymmetric information problem, as new investors are wary of potential opportunism by insiders. Myers & Majluf (1984) create a theoretical framework based on the assumption that management possesses information which investors do not and show how such a relationship may lead to firms passing up positive net present value projects. By issuing equity at stock price levels that management can estimate to be overvalued, a wealth transfer occurs from new shareholders to current shareholders (which often include senior management). Investors who take this into account will lower their firm valuation and this theory therefore predicts negative returns on announcement of an SEO. The asymmetric information problem may lead to a market failure as shown by Akerlof (1970) results, but entering into an underwriting agreement may help alleviate this problem.

Agency problems

Another problematic scenario arises in firms where management does not hold shares and wish to issue equity at overvalued prices only to bring capital inside the firm; capital which may ultimately end up on their pay checks, paying no heed to value creation for shareholders. These so-called agency problems were described by Jensen & Meckling

(1976) who claim that rational investors will be cautious of SEOs and lower their firm valuation accordingly.

Pecking order principle

The pecking order principle states that firms should use a “pecking order” when assigning funds to new projects (Myers 1984). Primarily, firms should employ internally generated capital and secondly, they can raise external capital, turning to the safest security first; bank debt, then corporate bonds and then possibly hybrid securities such as convertible bonds. Equity is only issued as a last resort. If firms act in line with this principle, little focus is devoted to maintaining a target debt-to-equity mix, as otherwise implied by capital structure theory. Since asymmetric information problems can in part explain firm reluctance to issue equity, implementing the pecking order principle could be rational. It is still debated whether the principle is used in practice (Frank & Goyal, 2003).

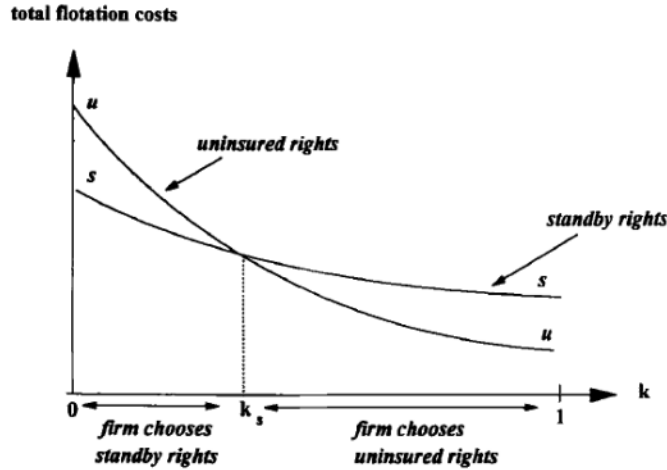
3.2 THEORY ON UNDERWRITING

3.2.1 SHAREHOLDER TAKE-UP

Bohren et al. (1997) suggest a framework to explain value implications of underwriting decisions, the shareholder take-up model, where total flotation costs of a rights issue are dependent upon the expected subscription of current shareholders. They argue that low quality firms with low expected shareholder take-up will not attempt an uninsured offer, while firms of high quality may. Although guarantees are costly, firms with low expected take-up will still be better off by employing underwriting because this increases the likelihood for their issue to succeed at a given offer price – ultimately lowering total flotation costs. This is illustrated in Graph 3 where k denotes shareholder take-up, uninsured rights are offerings with zero guarantees, and standby rights are fully underwritten offerings. The theory predicts an effect from underwriting that depends on firm quality; the announcement day return can go either way depending on whether management makes the correct decision or not.

Graph 3 - Cost-minimizing flotation method

Graph 3 is taken from Böhren et al. (1997) and shows how the choice of flotation method, w.r.t. the use of guarantees, is dependent on the extent to which existing shareholders are expected to subscribe to the offering. Expected shareholder take-up (k) is shown on the x-axis, ranging from 0 to 100%, and total flotation costs are shown on the y-axis.



As a firm moves along the x-axis, the cost-optimal choice shifts from standby rights to uninsured rights at the point $x = k_s$.

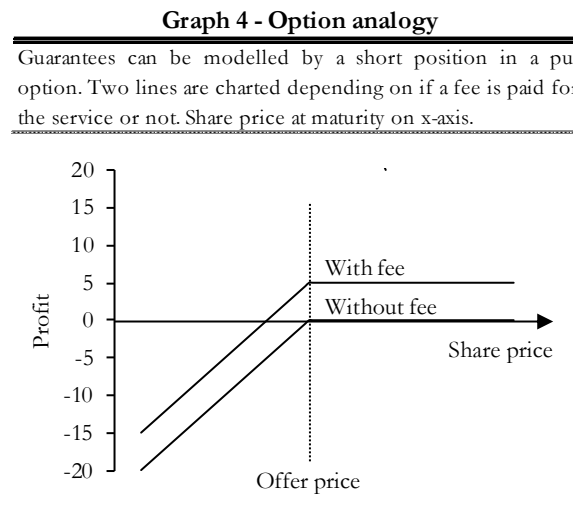
3.2.2 CERTIFICATION HYPOTHESIS

Booth & Smith (1986) relate underwriting to asymmetric information theory and attribute a positive certification effect to underwriting by noting the external source of the guarantee. After assuming costs to become an informational insider, the underwriting firm puts its reputational capital at stake by agreeing to support an issue. In the long run, underwriters would not be able to repeatedly put their seal on issues for which the offer price is not fair with respect to firm quality, as this would undermine their reputation and deter future business. The financial commitment in combination with the reputational risk remedies the asymmetric information problem and alleviates investors' moral hazard concerns. This hypothesis suggests that underwriting has a positive certification effect for the issuing firm's value and that underwritten issues will experience superior returns to uninsured offerings.

3.2.3 OPTION ANALOGY

Several studies have characterized underwriting as the short position in a put option which provides a way of looking at the risk to underwriting. For the purpose of the analogy, the option's underlying asset is equivalent to the company's shares, the time-to-maturity is the period from when the offer price is set to the end of the subscription

period, the exercise price is the offer price, and the price paid for the option is the underwriting fee. Graph 4 illustrates the profit of guarantors on the y-axis, depending on share price at maturity on the x-axis, and is shown for both underwriting agreements (with fee) and shareholder commitments (without fee).³



If this analogy holds, any increase in risk borne by underwriters will augment the certification effect described in Section 3.2.2. Cooney et al. (2003) argue this to be the case for the Japanese market which is characterized by early announcement of the offer price. Just as option prices increase in relation to the time-to-maturity because of increasing risk, Cooney attributes the higher abnormal returns to SEO announcements (in Japan compared to the US) to increased duration from when the offer price is set to the end of the subscription period.

³ Although not addressed in previous literature, it could be proposed that the absence of a fee equates shareholder commitments to forwards.

3.3 EMPIRICAL RESEARCH AND INSTITUTIONAL DIFFERENCES

Empirical research has found both positive and negative significant results and an international examination of previous results was conducted by Böhren et al. (1997), shown in Table 1.

Table 1 - Empirical results, international comparison

Listed are findings from various studies conducted on common stock issues on markets around the world. The 2-day CAR denotes average abnormal returns to stocks upon announcement of an imminent equity offering, and a * in sig indicates that the results are significantly different from zero at the 5% level or higher. Data from Böhren et al. (1997).

<i>Country</i>	<i>Flotation method</i>	<i>2-day CAR</i>	<i>sig</i>
United States ^a	Underwritten rights issues	-1.5%	*
Australia	All rights issues	-2.0%	
Canada	All flotation methods	-4.0%	*
Finland	All rights issues	4.9%	
Japan	Firm commitment issues ^b	4.0%	*
Korea	All rights issues	1.0%	*

^aIndustrial issues. For utilities, the same figure was -1.4% and significant.

^bFirm commitment offering where the underwriter buys the whole issue and assumes responsibility to sell forward.

Although all of the above flotation methods are not comparable, the survey suggests that there are variations between countries. Cooney et al. (2003) list three potential reasons for the international differences: (1) institutional differences in the underwriting process; (2) cross-country differences in the types of firms that issue stock; and (3) international differences in general market sentiment. One important factor for research on this topic is the period for which the underwriter is at risk. In the U.S., where announcement reaction is negative, the final offer price is usually set less than 24 hours before the issue is sold to investors (Eckbo & Masulis, 1995). In Norway, where law requires the offer price to be set at least three weeks prior to the beginning of the subscription period, Böhren et al. (1997) have shown a positive two-day announcement CAR of 0.5% to be significant at the 5% level.

Evidence of underwriting and guarantees also differ between studies and countries. Ginglinger et al. (2007) find significant negative announcement returns on the French market for both standby underwritten offerings and uninsured offerings. Their regression analysis shows that standby underwriting translates into a 1% increase in announcement day returns, significant at the 10% level. Böhren et al. (1997) study the Oslo Stock Exchange and find the opposite effect, that fully underwritten offerings

perform approximately 1.7 percentage points worse than uninsured offerings, also significant at the 10% level.

Studies on the Swedish rights issue market include a working paper by Molin (1996), a master thesis Fritzell & Hansveden (2006) and a published paper by Cronqvist & Nilsson (2005). All of these studies have examined press releases and news articles in order to determine the first announcement date. As described in Section 2.1, Swedish SEO practice involves the gradual release of issue information at firms' discretion. For the purpose of our study we have chosen the prospectus date as our main event window, which is why results from these studies will not be directly comparable. Their results are as follows: Molin (1996) examines 62 rights issues for the years 1980-1994 and find no statistically significant average abnormal returns on SEO announcement. Fritzell & Hansveden (2006) study 201 rights issues between 1986 and 2005 and find a negative and statistically significant average abnormal return of -2.2% on announcement. Cronqvist & Nilsson (2005) study 144 rights issues between 1986-1997 and show significant average abnormal returns on announcement of 2.0%.

In summary: in accordance with the varying predictions of theories in Section 3.1 and 3.2, empirical evidence on average market reactions to SEO announcements is mixed and may largely depend on the *general quality of investment opportunities* during the years of study and *institutional differences* between markets examined.

4. DATA

4.1 DATA SELECTION

The data set contains panel data for stocks which are listed on Nasdaq OMX Stockholm (OMXS) and have filed an SEO prospectus over the time period January 1, 2007 through December 31, 2012. Time-series data has been retrieved from Datastream and includes closing prices for each firm during a period of at least two years surrounding the issue prospectus date. Prices adjusted for corporate actions are used for most purposes, while unadjusted prices are used to calculate historical market capitalization. In addition to stock prices, time series data on the OMXS All-Share index has been obtained from Datastream for the period June 24, 2005 through March 28, 2013. This index includes all shares listed on OMXS and is value-weighted according to market capitalization.

The cross-sectional part of the data set has been manually collected by the authors of this thesis from individual prospectuses, which have been obtained from the SFSA online prospectus database. This data includes company specific financial information, industry, ownership figures, issue terms, and guarantee conditions, see Appendix A1 for a detailed list. Manually collected data is complemented by historical adjusted betas for each offering which are estimates from Bloomberg, based on monthly returns during five years prior to the event window.⁴ Datastream and Bloomberg are both renowned data providers and there is little reason to assume inaccuracies in the time-series data provided. The manually collected cross-sectional data set is subject to human error.

We have limited ourselves to Swedish data in order to avoid institutional differences in issue and underwriting process, which would distort results. No decision was actively made to limit data to the five year time period specified, instead the historical reach of the SFSA database we used to collect prospectuses set the boundaries for our study. The period includes years of varying market conditions and our data suggests seasonality in SEO frequency. Many issues during the crisis years of 2009-2010 intended to use proceeds to strengthen firm balance sheets. SEOs on alternative markets such as First

⁴ Adjusted betas are commonly used for more robust estimations, and are calculated as: $Adjusted\ beta = (Raw\ beta * 2/3) + (Market\ beta * 1/3)$

North and NGM Equity are disregarded due to illiquidity issues which would interfere with our estimation of normal returns.⁵

Each SEO observation in the final sample satisfies all of the following three criteria:

- i. It is a rights issue of only common equity (no combination offerings containing e.g. preference shares, debt instruments, or options)
- ii. The firm's common equity has been listed on the *Main list* of OMX Stockholm⁶ for at least one full year prior to the issue
- iii. No simultaneous *directed issues* (e.g. private placements or equity-for-debt settlements) are announced

After filtering accordingly, 91 observations remain.⁷ One observation was considered an extreme outlier – its abnormal return differed 10 standard deviations from the sample mean and substantially affected average results – and was dropped, bringing the final sample down to 90 observations (see Appendix A4 for details).

4.1.1 DATA MODIFICATION

Some companies in our sample do not report in SEK.⁸ For these companies, balance sheet figures and other nominal values used in our cross-sectional regression have been converted using either exchange rates specified in the prospectuses or by midpoint average exchange rates for the reporting period, downloaded from OANDA.⁹

⁵ OMX's *Main list* has stricter liquidity requirements than First North and NGM respectively, but illiquidity still occurs in our data set to some degree. This potential source of bias is addressed in Section 5.3.3.

⁶ The Stockholm exchange changed its list name to OMX in 2007, before that it was known as *Nordic list* (in Swedish *Nordiska listan*)

⁷ There were 105 rights issues on OMX's main list in total during the period of study.

⁸ These are Black Earth Farming, Nordea and Vostok Nafta.

⁹ OANDA Corporation, Historical exchange rates, (www.oanda.com).

4.2 DATA DESCRIPTION

Table 2 lists descriptive statistics for the collected cross-sectional data.

Table 2 - Summary statistics for entire sample of rights issues

Summary statistics of cross-sectional datapoints for the entire sample of 90 rights issues on OMX Stockholm during the period 2007-2012. All figures are stated in million SEK (unless stated otherwise). The information was collected from individual SEO prospectuses, see Appendix A1 for detailed variable descriptions.

Variable	Mean	Median	Min	Max	p25	p75	StDev
<i>Issuing firm financials</i>							
Total assets	110,376	911	25	5,267,531	217	3,979	634,109
Sales	6,999	503	0	163,917	72	2,035	22,351
Equity	5,384	413	1	197,813	109	1,198	23,788
Market capitalization	3,946	668	21	112,845	203	1,482	13,757
Net debenture	41,589	198	-231	2,276,152	6	958	256,760
Beta (adjusted) ^a	1.11	1.08	0.32	2.15	0.78	1.40	0.38
<i>Issue terms</i>							
Discount	37%	41%	-10%	96%	27%	47%	17%
Dilution	43%	20%	1%	252%	11%	52%	51%
Issue proceeds	1,242	231	15	28,760	97	503	3,792
as % of market cap	98%	43%	5%	2476%	22%	85%	271%
Total issue costs ^b	18	7	1	215	4	12	34
as % of issue value	6.4%	5.2%	0.8%	25.6%	3.3%	8.3%	4.3%
<i>Ownership variables</i>							
Blockholders (#)	3	3	0	7	2	4	1
Largest owner	22%	19%	3%	87%	11%	27%	15%
Free float	62%	61%	6%	100%	49%	77%	20%
<i>Guarantee variables</i>							
Guarantee extent ^c	83%	100%	0%	100%	73%	100%	28%
Shareholder commitment	31%	29%	0%	100%	14%	44%	23%
Underwriting extent	52%	57%	0%	100%	33%	75%	31%
Underwriting fee ^d	4.0%	3.8%	0.0%	11.4%	2.0%	5.1%	2.9%

^aBeta values are Bloomberg's adjusted 5-year CAPM betas.

^bIssuance cost includes underwriting fee and all other issue costs.

^cGuarantee extent is the sum of Shareholder commitment and Underwriting extent.

^dUnderwriting fee is calculated as the nominal amount paid for the underwriting service divided by the nominal value of the shares covered by the service (Fee in SEK / (Issue proceeds x Underwriting extent)).

Noteworthy features include large spreads in discount and dilution figures, as well as a high level of subscription guarantees. Swedish issues are often offered at deep discounts to the current market price, with a median of 41% in our sample. This can be compared to the U.S. where the average discount was 3% for 4,814 SEOs during the period 1986-1999 (Mola & Loughran, 2004) and 21% for 928 UK rights issues during 1985-1996 (Armitage, 2004). Table 3 and 4 show the distributions for the dilution and discount variables in detail.

Table 3 - Issue discount over time

Distribution of discounted issue prices for entire sample of 90 rights offerings in Sweden during 2007-2012; first by year and then by total number for the period. Issue discount is given by the offer price (as stated in the prospectus) divided by the market price of the stock on the day before the prospectus announcement.

<i>Interval</i>	By year						Total	
	2007	2008	2009	2010	2011	2012	n	%
-10-0%		1					1	1%
0-10%		2		2	1	2	7	8%
10-20%	1	1		2	2		6	7%
20-30%	2	3	1	3	1	2	12	13%
30-40%	2	1	3	2	3	6	17	19%
40-50%	4	1	15	5	2	4	31	34%
50-60%		2	4	4		2	12	13%
60-70%			2				2	2%
70-80%						1	1	1%
80-90%							0	0%
90-100%			1				1	1%
Total	9	11	26	18	9	17	90	100%
%	10%	12%	29%	20%	10%	19%	100%	

While discount is centered around 40-50%, there are variations in distribution over the years. In the crisis year of 2009 we see a clear increase in offerings which are more deeply discounted than issues in surrounding years. This observation is not surprising as times of financial turmoil will put more firms in a situation where equity needs to be increased. The corresponding increase in discount observed is theoretically predicted by the price pressure theory (Section 3.1.2). The effect of the financial crisis is controlled for with a dummy variable in the regression analysis (Section 6.2).

Groupings can also be seen in dilution figures, which seemingly favor multiples of 100 percentage increases. This is likely due to practical matters w.r.t the use of subscription rights; offerings are quoted as 'Rights issue $N:K$ ', where N denotes number of new shares which can be subscribed to given K number of old shares. The use of even numbers such as 1:1, 2:1 or 3:1 is simpler for investors to understand than for instance 27:6 and is therefore arguably the cause of the pattern observed in Table 4.

Table 4 - Issue dilution

Distribution of issue dilutions for the entire sample consisting of Swedish rights issues 2007-2012, i.e. the number of newly issued shares at full subscription divided by shares outstanding before the issue.		
<i>Interval</i>	<i>n</i>	<i>%</i>
0-20%	10	11%
20-40%	16	18%
40-60%	15	17%
60-80%	6	7%
80-100%	4	4%
100-120%	14	16%
120-40%	2	2%
140-160%	2	2%
160-180%	1	1%
180-200%	1	1%
200-220%	5	6%
220-240%	0	0%
240-260%	0	0%
260-280%	1	1%
280-300%	1	1%
300-320%	5	6%
>320%	7	8%
Total	90	100%

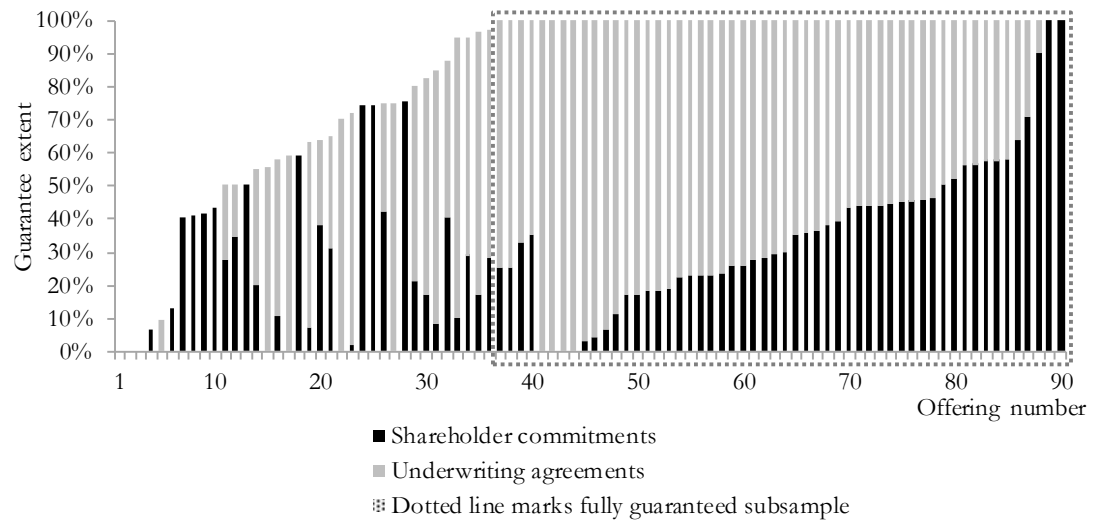
More than 25% of issues dilute current owners by more than 100%. For such issues, it is crucial for current shareholders to take action in order to capture the economic value of their rights, either by subscribing for shares or by selling their rights.

4.2.1 GUARANTEES AND SUBSAMPLE CREATION

The average SEO in Sweden is guaranteed to an extent of 83%, with a standard deviation of 28%. As shown in Graph 5, 52 of the 90 issues in our data set are fully guaranteed by either underwriting or shareholder commitment, while the remaining 38 issues enjoy a guarantee range from 0 to 99%. This is the basis for the subsample classifications in our event study (Section 6.1.2). Furthermore, there seems to be no favored ratio of shareholder commitment to underwriting.

Graph 5 - Guarantees in offerings

Distribution of subscription guarantees in the entire sample of 90 rights offerings during the period 2007-2012. Guarantee extent is the sum of shareholder commitments, where shareholders commit to subscribe for shares without any remuneration and; underwriting agreements, where investors commit to subscribe for shares with remuneration in proportion to the commitment.



5. METHOD

To investigate our two research objectives:

Research objective I:	<i>Describe market reaction to SEO prospectus releases</i>
Research objective II:	<i>Evaluate the effect to SEO guarantees</i>

we conduct an event study followed by OLS regression analysis. This section first explains the event study and regression methods employed, and then presents potential sources of bias.

5.1 EVENT-STUDY

Abnormal returns (AR) are assumed to capture the impact of the event, implying informational value in the SEO prospectus (at event time $\tau = 0$). ARs are defined as actual returns less expected normal returns; for firm i on date τ , this gives

$$AR_{i\tau} = R_{i\tau} - E(R_{i\tau}|X_\tau) \quad (1)$$

where X_τ is the conditioning information driving a normal performance model of choice, such as the *market model* (making X_τ the market return). For the purpose of using the market model to estimate normal returns, security returns are assumed to be jointly multivariate normal random variables, which are independent and identically distributed through time. Although strong, MacKinlay (1997) writes that this assumption is empirically reasonable, but also that inferences made using the market model are robust to deviations from the assumption. For firm i and event time τ , the market model is

$$R_{i\tau} = \alpha_i + \beta_i R_{m\tau} + \varepsilon_{i\tau} \quad (2)$$

where $R_{i\tau}$ and $R_{m\tau}$ are the security and market returns¹⁰ respectively, and $\varepsilon_{i\tau}$ is the zero mean disturbance term with variance $\sigma_{\varepsilon_i}^2$. Loadings for the parameters α_i and β_i are estimated using robust OLS regression¹¹ (yielding efficient and consistent estimates given the assumption stated above) during an estimation window comprising 120

¹⁰ This study uses the OMXS All-Share Index to estimate market returns.

¹¹ Robust regressions are used as there is no reason to assume homoscedasticity (MacKinlay, 1997).

trading days ($E = 120$). Event window length was chosen with the intent to capture near term performance for firms as they approach an equity offering.¹² In order to shield normal estimations from information leakage bias, a 60 day black-out period is employed prior to the event window. The estimation period therefore ranges from event time $\tau = -180$ to $\tau = -61$. For firm i , the OLS estimators are

$$\hat{\beta}_i = \frac{\sum_{t=-180}^{-61} (R_{it} - \bar{R}_i)(R_{m\tau} - \bar{R}_m)}{\sum_{t=-180}^{-61} (R_{m\tau} - \bar{R}_m)} \quad (3)$$

$$\hat{\alpha}_i = \bar{R}_i - \hat{\beta}_i \bar{R}_m \quad (4)$$

where $\bar{R}_i$ and $\bar{R}_m$ are the arithmetic means of stock and market returns for the estimation window. The market model can now be used to estimate normal returns, where sample abnormal returns are given by

$$\widehat{AR}_{it} = R_{it} - (\hat{\alpha}_i + \hat{\beta}_i R_{m\tau}) \quad (5)$$

This is the disturbance term from the market model (2), calculated on an ‘out of sample’ basis. Under the null hypothesis (conditional on the event window market returns) it has a zero mean, and its variance is that of disturbance term. Sample abnormal returns are then aggregated over all observations ($N = 90$) to give daily estimates for the population means

$$\overline{AR}_\tau = \frac{1}{N} \sum_{i=1}^N \widehat{AR}_{it} \quad (6)$$

which follow a students t -distribution¹³ with 87 degrees of freedom,

$$\overline{AR}_\tau \sim t(0, Var(\overline{AR})) \quad (7)$$

¹² A longer window might provide more robust results but is likely capture less of the current status of the company.

¹³ t -distributions will be used throughout on account of the population variances being unknown

a zero mean, and a variance which we estimated using the sample variance of daily means according to Equation 8 where $\overline{AR}_\tau$ is the arithmetic mean of $\overline{AR}_\tau$ over the estimation window.

$$Var(\overline{AR}) = \frac{1}{E-1} \sum_{\tau=-180}^{-61} (\overline{AR}_\tau - \overline{AR})^2 \quad (8)$$

We can now test for the occurrence of daily abnormal returns surrounding the event and preliminary observations surrounding the prospectus date suggest the use of three event windows: T_0 , T_b and T_a . The 2-day prospectus window (T_0) includes the prospectus publication date and the following trading day in order to capture the effect of events that occur after the stock market closes on the day of announcement ($\tau_0, \tau_1 \in T_0$). The ‘before’ and ‘after’ windows (T_b and T_a) each comprise 5 consecutive trading days adjacent to T_0 ($\tau_{-1}, \tau_{-2} \dots \tau_{-5} \in T_b$), ($\tau_2, \tau_3 \dots \tau_6 \in T_a$). The mean abnormal daily returns within these windows are aggregated to produce three sample cumulative abnormal returns (CAR)

$$\overline{CAR}_x = \sum_{T_x} \overline{AR}_\tau \quad (9)$$

where $x = 0, b$ or a denotes each window respectively. The length of each event window is L_x ($L_0 = 2, L_b = L_a = 5$) and the variance of each $\overline{CAR}_x$ is estimated by multiplying the variance estimate of daily AR means by the number of days included in the window.

$$Var(\overline{CAR}_x) = Var(\overline{AR}) * L_x \quad (10)$$

These values are used to create three stochastic test variables, θ_x , which under H_0 follow a t -distribution with 87 degrees of freedom

$$\theta_x = \frac{\overline{CAR}_x - 0}{\sqrt{Var(\overline{CAR}_x)}} \sim t(0,1) \quad (11)$$

and can be used to test the null hypothesis of our first research objective: that abnormal returns around an SEO prospectus are zero. To address our second research objective (II) we compare the means of the fully guaranteed (*full*) and remaining (*rest*) subsample. The null hypothesis of no difference can be tested using three additional stochastic variables, φ_x , which under H_0 approximately follow a student's t -distribution with 38 degrees of freedom,¹⁴

$$\varphi_x = \frac{(\overline{CAR}_{full,x} - \overline{CAR}_{rest,x}) - 0}{\sqrt{\frac{Var(\overline{CAR}_{full,x})}{n_{full}} - \frac{Var(\overline{CAR}_{rest,x})}{n_{rest}}}} \sim t(0,1) \quad (12)$$

where mean CARs and variances are estimated for each subsample: first, new daily means are calculated for each subsample using Equation 6 (including only firms featured in each subsample, $N_{full} = 52$ and $N_{rest} = 38$), and aggregated using Equation 9 producing $\overline{CAR}_{full,x}$ and $\overline{CAR}_{rest,x}$. Second, since there is no reason to assume equal population variances for the two subsamples, Equation 8 is used to estimate separate variances for each, which are aggregated using Equation 10. The two variance are weighted as seen in the denominator of Equation 12. Finally, a two-sided $1 - \alpha\%$ confidence interval for the difference in means is given by

$$\widehat{CAR}_{diff,\alpha,x} = (\overline{CAR}_{full,x} - \overline{CAR}_{rest,x}) \pm \varphi_{x,\alpha/2} * \sqrt{\frac{Var(\overline{CAR}_{full,x})}{n_{full}} - \frac{Var(\overline{CAR}_{rest,x})}{n_{rest}}} \quad (13)$$

where $\varphi_{x,\alpha/2}$ is the upper $\alpha/2$ critical value for a t -distribution with 38 degrees of freedom.

¹⁴ Since two standard errors are estimated, φ_x does not exactly follow a student's t -distribution. To compensate for this, the smaller of n_{full} and n_{rest} degrees of freedom (i.e. 38) is used which produces conservative p-values.

5.2 REGRESSION ANALYSIS

Robust OLS regressions are run to supplement our event study. The models are developed based on theory and previous empirical literature listed in Section 3, and Proposed explanatory variables are explained in Table 5.

Regression model I – *Based on theoretical frameworks.*

$$CAR_{i,ann} = a + \beta_1 * Size_i + \beta_2 * Discount_i + \beta_3 * (Beta_i * NDE_i) + \beta_4 * Momentum_i + \beta_5 * Commitment_i + \beta_6 * Use_i + \varepsilon_i$$

Regression model II – *Based on empirical findings and intuition.*

$$CAR_{i,ann} = a + \beta_1 * Size_i + \beta_2 * Discount_i + \beta_3 * (Beta_i * NDE_i) + \beta_4 * CAR_{i,pre} + \beta_5 * Crisis_i + \varepsilon_i$$

Regression model III – *Used to test for clustering issues (see Appendix A3).*

$$CAR_{i,ann} = a + \beta_1 * Size_i + \beta_2 * Discount_i + \beta_3 * (Beta_i * NDE_i) + \beta_4 * CAR_{i,pre} + \beta_5 * Crisis_i + \beta_5 * Proximity_i + \varepsilon_i$$

Regression model IV – *Used to evaluate the overreaction pattern discussed in Section 7.*

$$CAR_{i,post} = a + \beta_1 * CAR_{i,pre} + \beta_2 * CAR_{i,ann} + \beta_3 * Crisis_i + \varepsilon_i$$

Table 5 - Variables included in regression models

List of all variables used in regression models I-IV. Detailed description of collection are presented in Appendix A1.

Variable	Unit	Description
<i>Cumulative abnormal return variables</i>		
1. $CAR_{i,pre}$	%	Cumulative abnormal returns to firm i for the 5-day preprospectus event window.
2. $CAR_{i,ann}$	%	Cumulative abnormal returns to firm i for the 2-day prospectus event window.
3. $CAR_{i,post}$	%	Cumulative abnormal returns to firm i for the 5-day postprospectus event window.
<i>Other variables</i>		
4. Size	%	Issue proceeds at full subscription relative to the market capitalization the day before prospectus announcement. Price pressure theory indicates that larger issues should see more negative announcement returns.
5. Discount	%	Discount given in offer price relative to the closing price on the day before the prospectus publication.
6. Beta	Scalar	Estimated beta-parameter from market model regression. Proxy for cash flow volatility.
7. NDE	%	The net debt-to-equity ratio, calculated as interest bearing debt less cash and equivalents divided by the book value of equity.
8. Beta*NDE	%	Combination variable indicating severity of indebtedness. High values indicate high cash flow volatility and high indebtedness. Low values indicate low cash flow volatility and low indebtedness. Firms with high values of the variable should fare well from additional equity and vice versa, in line with capital structure theory.
9. Momentum	%	Cumulative abnormal returns for days -180 to -60. Asymmetric information theory suggests that strong recent performance may induce managers to opportunistic equity issuances. High momentum is predicted to negatively impact announcement returns.
10. Commitment	Dummy	Dummy variable which assumes 1 when the financial advisor drafting the prospectus has also acted as an underwriter for the issue. In connection to the certification hypothesis, such commitment should provide positive announcement effects.
11. Use	Dummy	Dummy variable which assumes 1 when the proceeds of the issue are intended for a certain offensive use (M&A, product development or new market entrance). Issues that primarily intend to strengthen the balance sheet are always 0.
12. Crisis	Dummy	Dummy variable which assumes 1 when the prospectus filing date is after September 15, 2008 (date of Lehman Brothers bankruptcy).
13. Proximity	Dummy	Dummy variable which assumes 1 when the prospectus filing date is within one day of another prospectus filing. Included to control for issues with clustering.

5.3 POTENTIAL SOURCES OF BIAS

5.3.1 NONNORMAL RESIDUALS IN MARKET MODEL REGRESSIONS

In estimating normal returns we have used a market model setting with individual regressions for each of the 90 issues. Our results from running the Jarque-Bera test for normality in residuals are presented in Table 6.

Table 6 -Tests of market model regressions

Summary statistics for 90 Jarque-Bera tests of normality, performed on the residuals of each of the 90 market model regressions. Percentage rejected denotes the extent of the regressions where normality in residuals are rejected at the 5% significance level.	
No. of regressions rejected at 5%	83
Total no. of regressions	90
Percentage rejected	92%

A substantial amount of the regressions suffer from nonnormal residuals, which makes inferences from the market model less reliable. This is expected as the market model is a parsimonious regression which does not aspire to capture detail.

5.3.2 OVERLAPPING EVENT WINDOWS

Although we implicitly assume that the separate rights offerings are independent, there is reason to believe that this assumption is violated because the event windows overlap each other at times (i.e. several offerings occur clustered). This may lead to covariance between the security abnormal returns which adds a covariance term to variance estimations. 24 of 90 offerings in the entire sample have prospectus filing dates within one day of another offering. Through various tests, we find that clustering has no pivotal impact on our inferences (see Appendix A3).

5.3.3 ILLIQUIDITY

Nonsynchronous trading can introduce a bias into the market model by affecting securities' variances and covariances and arises whenever prices are recorded at irregular time intervals. Scholes & Williams (1977) present empirical evidence that suggests betas to be underestimated as a result, by 10 to 20%; they resolve this problem by constructing a consistent non-trading-adjusted beta. However, Jain (1986) considers the influence of illiquidity on abnormal returns to be minimal and that adjustments are unimportant in general.

While all stocks listed on OMX Stockholm are subject to liquidity requirements, the *Small Cap* Section is in general characterized by lower liquidity. Stocks in our sample display different degrees of liquidity, but no adjustments have been made in this study. The possible underestimation of market model betas would cause an overestimation of abnormal returns and would misleadingly increase the significance level of the results.

6. RESULTS

This Section will first present the event study results for the entire dataset and then the subsamples, followed by the results from the regression analysis .

6.1 EVENT STUDY FOR ENTIRE DATA SET

Graph 6 shows the movement of average abnormal returns for the entire sample surrounding the prospectus and gives a sense of our overall results. Distinct increases and decreases can be observed before and after the prospectus publication, while the average abnormal return on announcement is only slightly positive. The pattern of sharp movements is vexing and resembles an overreaction pattern.

Graph 6 - Abnormal returns surrounding prospectus announcement

Indexed average abnormal returns for entire sample of 90 rights issues 2007-2012 over a period of 41 days, from 20 days before to 20 days after the prospectus announcement. Index 100 at $t = -21$. Each day's index is multiplied by $1+AR_t$ give the next day's index.

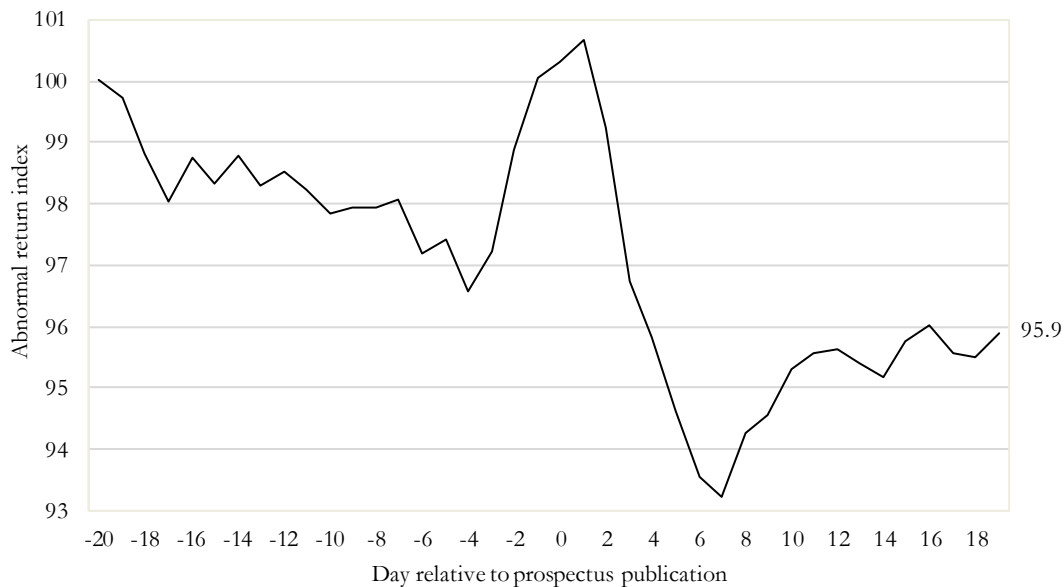


Table 7 details the results of our main event study for all three event windows; the two-day prospectus CAR, the five-day preannouncement CAR and the five-day postannouncement CAR. We find significant abnormal returns before and after the announcement at the 1% level, while no statistically significant results occur on the two-day announcement. Therefore no claim can be made that the prospectus announcement has a unilateral effect on share price which seems consistent with the Swedish practice

of disclosing preliminary issue terms prior to releasing the prospectus.¹⁵ For the five-day period before announcement, the study shows average positive cumulative abnormal returns of 2.9%; and the five-day period after announcement shows average negative cumulative abnormal returns of -6.9%.

Table 7 - Event study results for entire sample

Results for three t-tests in the entire sample of 90 rights issues, one performed on each of our event window CARs, with the null hypothesis that CARs are equal to zero.

<i>Interval</i>	<i>2-day</i>	<i>5-day before</i>	<i>5-day after</i>
CAR	0.61%	2.94%***	-7.28%***
Standard error	0.68%	1.08%	1.08%
p-value	0.3739	0.0079	0.0000

*** p<0.01; ** p<0.05; * p<0.1

The reversal after the prospectus more than offsets the preannouncement increase and the seemingly unwarranted back-and-forth movement is discussed in Section 7. Our results cannot be directly compared to other studies on Swedish data as the event windows center around different dates, however we list them for reference: Molin (1996) finds no statistically significant average abnormal return on announcement, Fritzell & Hansveden (2006) finds a negative and significant -2.2% average abnormal return and Cronqvist & Nilsson (2005) show significant average abnormal return of 2.0%. Detailed daily abnormal returns for our study are displayed in Table 8.

¹⁵ For detailed CAR distributions, refer to Appendix A5.

Table 8 - Average daily abnormal returns and average cumulative abnormal returns

Primary findings for the entire sample of 90 rights issues during the period 2007-2012 on a daily basis. Abnormal returns (AR) are averages of daily returns less conditional normal returns for each of the firms and cumulative abnormal returns (CAR) is the arithmetic sum of ARs over a given window. Each daily average AR is significantly different from zero in its own right if indicated in the adjacent sig column. Three event window CARs are in bold and significance is shown in the corresponding sig column.

Abnormal returns				Cumulative abnormal returns					
Day	AR	sig	t statistic	Progressive	2-day	5-day before	5-day after	sig	t statistic
-20	0.0%		0.065	0.0%					
-19	-0.3%		-0.646	-0.3%					
-18	-0.9%	*	-1.867	-1.2%					
-17	-0.8%		-1.657	-2.0%					
-16	0.7%		1.544	-1.2%					
-15	-0.5%		-0.931	-1.7%					
-14	0.5%		1.021	-1.2%					
-13	-0.5%		-1.060	-1.7%					
-12	0.3%		0.517	-1.5%					
-11	-0.3%		-0.640	-1.8%					
-10	-0.4%		-0.826	-2.2%					
-9	0.1%		0.198	-2.1%					
-8	0.0%		0.007	-2.1%					
-7	0.1%		0.247	-1.9%					
-6	-0.9%	*	-1.837	-2.8%					
-5	0.2%		0.485	-2.6%		0.2%			
-4	-0.8%	*	-1.750	-3.4%		-0.6%			
-3	0.6%		1.337	-2.8%		0.0%			
-2	1.7%	***	3.580	-1.1%		1.8%			
-1	1.2%	**	2.426	0.1%		2.9%		***	2.718
0	0.3%		0.567	0.4%	0.3%				
1	0.3%		0.697	0.7%	0.6%				0.894
2	-1.4%	***	-2.915	-0.7%			-1.4%		
3	-2.5%	***	-5.240	-3.2%			-3.9%		
4	-0.9%	*	-1.945	-4.2%			-4.9%		
5	-1.2%	**	-2.576	-5.4%			-6.1%		
6	-1.2%	**	-2.385	-6.6%			-7.3%	***	-6.735
7	-0.3%		-0.668	-6.9%					
8	1.1%	**	2.298	-5.8%					
9	0.3%		0.653	-5.5%					
10	0.8%		1.599	-4.7%					
11	0.3%		0.543	-4.4%					
12	0.1%		0.150	-4.4%					
13	-0.2%		-0.471	-4.6%					
14	-0.2%		-0.493	-4.8%					
15	0.6%		1.248	-4.2%					
16	0.3%		0.565	-3.9%					
17	-0.5%		-0.964	-4.4%					
18	-0.1%		-0.168	-4.5%					
19	0.4%		0.903	-4.1%					
20	-0.1%		-0.113	-4.1%					

Standard errors: Daily (0.0048) 2-day (0.0068) 5-day (0.0108)

*** p<0.01; ** p<0.05; * p<0.1

6.2 EVENT STUDY FOR SUBSAMPLES

The data set is split into two subsamples based on level of guarantee to evaluate whether it can be inferred that fully guaranteed issues fare better than issues which are not. The *fully guaranteed subsample* includes 52 observations where all offered equity was guaranteed to be sold, either through fee-based underwriting agreements or formal shareholder commitments, or a combination of the two. The remaining 38 observations are included in the *remaining subsample*.¹⁶ The same testing procedures are applied to both subsamples as for the entire data set; the results of these two event studies are shown in Table 9.

Table 9 - Event study results for fully guaranteed subsample

Results for three t-tests in the fully guaranteed subsample of 52 rights issues compared to the remaining subsample of 38 rights issues. Test are performed on each of our event window CARs, with the null hypothesis that CARs are equal to zero.			
<i>Interval</i>	<i>2-day</i>	<i>5-day before</i>	<i>5-day after</i>
<i>Fully guaranteed subsample</i>			
CAR	1.80%**	3.24%**	-7.07%***
Standard error	0.85%	1.34%	1.34%
p-value	0.0388	0.0194	0.0000
<i>Remaining subsample</i>			
CAR	-1.02%	2.53%*	-7.56%***
Standard error	0.94%	1.48%	1.48%
p-value	0.2858	0.0974	0.0000

*** p<0.01; ** p<0.05; * p<0.1

In contrast to our full sample where inferences could not be made about the two-day announcement CAR, the subsample sees cumulative abnormal returns of 1.8%, statistically significant at the 5% level. The difference in two-day CARs between subsamples is tested and the results presented in Table 10.

Table 10 - Comparison of subsample CAR means

Results for a comparison-of-means test between the fully guaranteed subsample of 52 rights issues and the remaining subsample of 38 rights issues. Test are performed on each of our event window CARs, with the null hypothesis that means are equal.			
<i>Interval</i>	<i>2-day</i>	<i>5-day before</i>	<i>5-day after</i>
CAR diff.	2.82%***	0.72%**	0.49%
Standard error	0.19%	0.30%	0.30%
p-value	0.0000	0.0243	0.1164

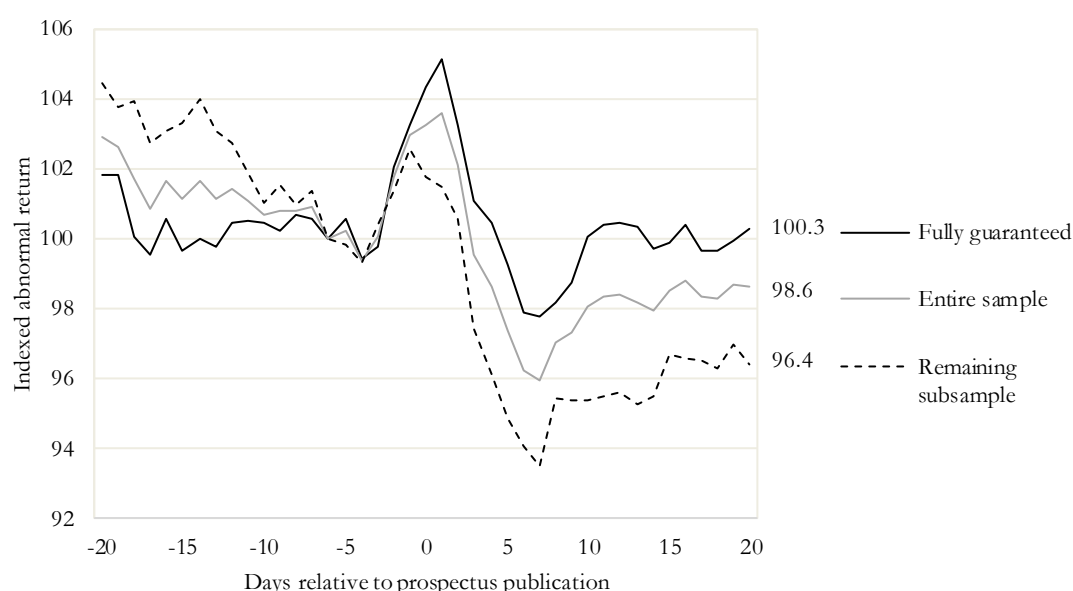
*** p<0.01; ** p<0.05; * p<0.1

¹⁶ The fully guaranteed sample would for instance include offerings with: 100% underwriting *or* 100% shareholder commitments *or* 80% shareholder commitments paired with 20% underwriting. It would not include offerings with: 80% shareholder commitments paired with 19% underwriting.

The average difference in two-day CARs between fully guaranteed and remaining issues is 2.8%. A 99% confidence interval for the difference is 2.3% to 3.3%. These results strongly suggest that fully guaranteed issues are received more positively by the market on average. The five-day preannouncement CARs show a difference of 0.7%, significant at the 5% level, while five-day postannouncement CARs show a difference of 0.5% which is not statistically significant. Graph 7, showing development for both the entire data set and the subsamples, illustrates the returns to each (index 100 at $t = -6$). The same overreaction pattern can be observed for both subsamples.

Graph 7 - Comparison of subsample abnormal returns

Data from 90 rights issues during the period 2007-2012. The graph compares abnormal returns to each subsample, showing the entire sample for reference. Index 100 at $t = -6$. Fully guaranteed subsample offerings are guaranteed to sell 100% of the offered equity. Remaining subsample consists of all other observations. Each day's index is multiplied by $1 + AR_t$ to give the next day's index.

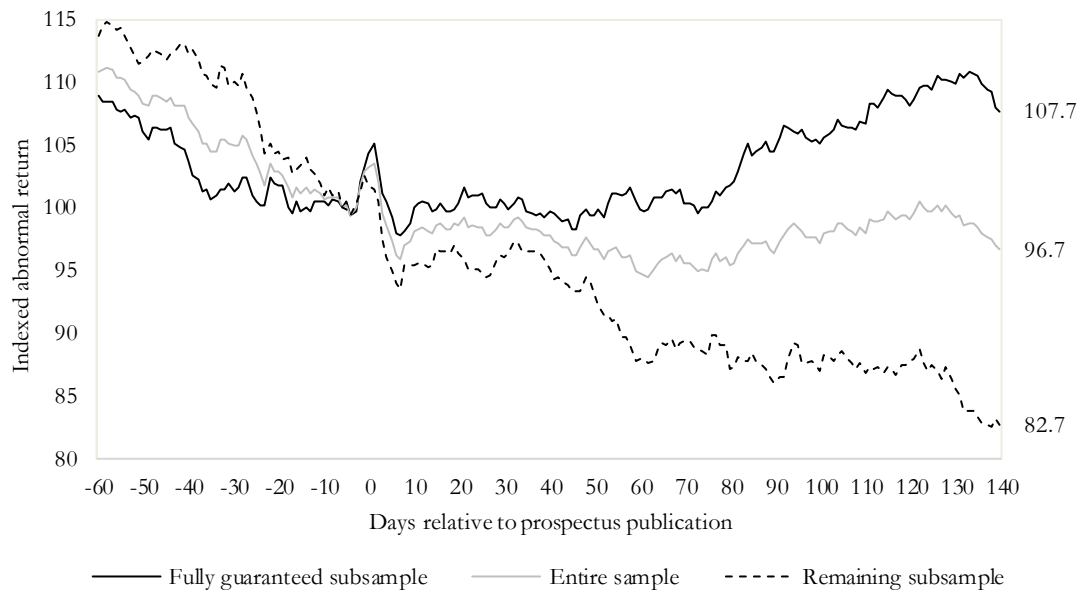


Indexed results show that the average abnormal return of holding fully guaranteed offerings for the period $t = -5$ to $t = 20$ is 3.9pp more positive than holding the remaining subsample. Although inferences over longer windows are subject to substantial noise (increasing variance and new information releases) and hence statistically weak, the graph does suggest that stocks of fully guaranteed issues perform better than the average SEO. The lion share of the dispersion seems to occur on the prospectus release date, which suggests that guarantee details (or the confirmation of guarantee status) are on average new information in the prospectus – or proxies for

some other information which usually appears in relation to it. A further extended view, which should be interpreted with great caution, is provided in Graph 8, and hints that this effect might be persistent and increasing over time.

Graph 8 - Extended view of subsample abnormal returns

Data from 90 rights issues during the period 2007-2012. The graph compares abnormal returns to each subsample, showing the entire sample for reference. Index 100 at $t = -6$. Fully guaranteed subsample are offerings which are guaranteed to sell 100% of the offered equity. Remaining subsample consists of all other observations. Each day's index is multiplied by $1+AR_t$ to give the next day's index.



Indexed 100 at $t = -6$, the graph shows abnormal return development over 140 days after the offering. The two subsamples can be seen to diverge at around one month after the prospectus. The fully guaranteed subsample reaches an abnormal return index of 107.7, while the remaining subsample is down nearly 20% at 82.7. This index difference of 25 points is remarkable, especially considering the short time period.

6.3 REGRESSION ANALYSIS

Table 12 shows the results of regression models I and II, regressing our two-day prospectus CARs on various factors, as detailed in Section 5.2. All regressions displayed nonnormal residuals and inferences should be made with caution, why the regression analysis is only supplementary and no additional models were developed. Please note that only 89 of the 90 observations were included in the regressions on account of no beta estimate being available from Bloomberg for the company ScanMining.

Table 11 - 2-day prospectus announcement CARs regression

Cross-sectional regression on 89 rights issues during the period 2007-2012. The 2-day prospectus cumulative abnormal returns regressed in two models. (I) according to previous literature and theory and (II) main regression model		
Model	Model I	Model II
<i>Size (%)</i>	0.0116*** (0.0023)	0.0109*** (0.0018)
<i>Discount (%)</i>	0.0495 (0.0417)	0.1300*** (0.0419)
<i>Capital structure (Beta * NDE)</i>	0.0032 (0.0022)	0.0041* (0.0024)
<i>Momentum (%)</i>	-0.0151 (0.0413)	
<i>Commitment</i>	0.0141 (0.0231)	
<i>Use (D)</i>	0.0097 (0.0172)	
<i>5-day pre-prospectus CAR (%)</i>		-0.2660*** (0.0779)
<i>Crisis (D)</i>		-0.0273* (0.0155)
<i>Constant</i>	-0.0379** (0.0178)	-0.0285* (0.0151)
<i>Observations</i>	89	89
<i>R²</i>	0.202	0.303

Robust standard errors in parentheses. D denotes dummy variable.

*** p<0.01, ** p<0.05, * p<0.1

Model I was developed in accordance with evidence in previous literature and theory and yields an R² of 20%, while regression model II reaches an R² of 30%. CARs are input in percent and therefore factor loadings on coefficients denote *percentage point* increases (pp) for any 1 *unit* increase in the explanatory variable.

Model I – Theoretical framework

For model I we note that of all explanatory variables, only *size* is statistically different from zero. Remaining variables are all insignificant at a cut-off point of 10 percent; since other studies have noted significant effects to these variables this suggests that our model is misspecified either due to: the fact that Swedish institutional settings are different enough to invalidate theories, or that the effects to these factors have already been incorporated into share price prior to the prospectus. The size variable will be interpreted in model II as the misspecification of this model might induce bias.

Model II – Best fit

Model II was developed to explain variations in prospectus returns by selecting a set of intuitive variables from our data set. Counter to Asquith & Mullins (1984), Ginglinger et al. (1998) and Eckbo et al. (1992), and inconsistent with the price pressure theory prediction, our *size* variable has a positive coefficient,¹⁷ indicating that larger issues in our sample generally see more positive announcement returns. A 1pp increase in the size variable translates to a 0.01pp increase to two-day CAR. The *discount* variable is also positive and significant. It suggests that deeper discounted issues see higher announcement day return, specifically, a 1pp increase in discount is related to a 0.13pp increase to two-day CAR. Böhren et al. (1997) find insignificant effects for discount in a study on the Oslo Stock Exchange. The *capital structure* interaction variable, capturing severity of indebtedness, is positive and significant at the 10% level. Interpreting interaction variables is difficult, but the positive sign on the capital structure variable suggests that companies with excessive gearing will benefit from additional equity and is in line with optimal capital structure considerations (Section 3.1.1).

The strong reversion pattern noted in the event study is confirmed in our regression of announcement day returns; two-day announcement CARs are significantly and inversely related to the five-day preprospectus CARs. The results suggest that a 1% preprospectus CAR translates into a -0.27pp return on prospectus announcement. The dummy variable *crisis*, significant at the 10% level, is active when the prospectus is published

¹⁷ Asquith & Mullins use the same explanatory variable for size as we do, while the two other studies employed the logarithm of gross proceeds as their size measure. They all find negative and significant coefficients.

after the Lehman Brothers bankruptcy on 15 September 2008 and associates such offerings with a -2.7% two-day announcement return.

Model IV – Overreaction pattern

Table 12 shows the results of regressing our five-day postannouncement CARs on near term performance and a dummy variable for postcrisis market conditions. The model yields an R^2 of 17%.

Table 12 - 5-day post-prospectus CARs regression

Cross-sectional regression on 90 rights issues during the period 2007-2012. The 5-day post-prospectus cumulative abnormal returns regressed on previous near-term performance and crisis control variable, in model IV.	
<i>2-day prospectus CAR</i>	-0.5001*** (0.1507)
<i>5-day pre-prospectus CAR</i>	-0.2510** (0.1021)
<i>Crisis</i>	-0.0505** (0.0234)
<i>Constant</i>	-0.0197 (0.0197)
<i>Observations</i>	90
<i>R²</i>	0.171

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The regression shows significant negative relationships to all of the included explanatory variables. A 1% five-day preprospectus CAR translates into a -0.25pp effect on five-day postprospectus CAR, significant at the 5% level. The corresponding effect related to the announcement CAR is -0.50pp and is significant at the 1% level. These findings suggest negative autocorrelation of near term performance which Lo & MacKinlay (1990) conclude is a key element of any overreaction theory. This may lend support to the pattern observed in the event study being an overreaction. Offerings for the period after the Lehman Brothers bankruptcy are associated with an additional approximate -5.0pp five-day postprospectus CAR, as indicated by the crisis variable, which is significant at the 5% level.

7. DISCUSSION

Research objectives

The first of our two research objectives aimed to *map market reactions to prospectuses* and determine whether they carry informational value when many details have already been released. Abnormal returns for individual firms do occur, however the event study results in Section 6.1 finds no statistically significant average effect. Instead an ‘overreaction’ pattern is observed in the surrounding event windows. The second objective of *guarantee effects* is addressed by splitting the data set into subsamples in Section 6.2. We are able to point to a positive signaling effect for guarantees and observe a remarkable difference in share price development between fully guaranteed and remaining issues.

Institutional differences

The many dissimilar results from around the world support the theory that institutional differences are a key factor to explaining market reactions to SEOs. Factors unique to Sweden include; highly discounted issues which entail warrants with substantial nominal value; offer prices which are set long before the end of the subscription period, putting guarantors at substantially higher risk; issues which are often very large w.r.t. outstanding shares; and large blockholders who take active roles in managing firms. For the sake of discussion we will speculate how these factors might relate to the results we see.

Prospectus date

On announcement of the prospectus, we find average abnormal returns of 0.6% which are not sufficient to statistically establish a positive reaction (Section 6.1). Since key information has, to varying extents, already been incorporated into share prices, a limited reaction is not surprising. The prospectus acts as a confirmation of investor expectations which, in line with the insignificant results, seem to be neither over or under optimistic on average, but fairly accurate. Had we found significant results, it would have entailed that the prospectus itself was *ceteris paribus* a signal to investors, which could be attributed to the fact that the execution of the issue is imminent.

Any event study must consider the potential for information leakages which makes determining the date when the new information is incorporated into share price difficult. By studying the prospectus filing date as opposed to the first announcement of an impending SEO, which many before us have done, on a market characterized by an incremental release of information, this paper effectively examines another phenomenon altogether. Investors' expectations are built up during the weeks leading up to the prospectus and are then officially confirmed or corrected, causing a reaction. However, the fact remains that the amount of information released beforehand is highly discretionary. This means that for every offering, investors will be reacting to disparate amounts of new information when the prospectus is released, which may very well be the reason for the nonunilateral announcement window movements we observe. It may also explain the fact that regression analysis has proved inconclusive and the results puzzling. Additionally, the theories presented in Section 3 are for the same reason not directly applicable to our analysis, but owing to the lack of studies conducted on the prospectus filing date they remain the most relevant substitutes. This knowledge void entails that we cannot say whether the peculiar movements we see are an isolated observation.

Theory and empirical research

The relationships suggested by our regression analysis do in fact not echo the theoretical background. A specific intended offensive use for the proceeds (such as an M&A or new market entrance) does not relate to announcement performance, statistically speaking, despite that such plans are regarded as positive information to shareholders. Neither is financial commitment from the lead financial advisor statistically positive for the announcement returns. A positive effect is expected according to the certification hypothesis, which states that if the financial advisor puts its reputation at stake, the issue should *ceteris paribus* be received more positively. While the effects of this endorsement may be too small to discern, it is more likely that such information in general reaches the market before the prospectus date and is already incorporated in share prices. This is in line with the Swedish practice of a gradual information leakage before the prospectus which finalizes the terms.

A more tailored model explaining the two-day announcement returns, finds that large offerings and highly discounted offerings are significantly more positively received by

the market. The finding is contrary to price pressure theory and there is no clear cut explanation for the positive sign. In a wider perspective, it might be the case that firms who undertake large offerings and highly discounted offerings have been in trouble for some time which has eroded the share price. When these firms finally publish a prospectus it may be received as a positive sign by the market that the issue is imminent; as investors may have been expecting a failed issue prior to the publication. In an attempt to control for firms that are excessively indebted, we have constructed a capital structure variable that acts as a proxy for debt problems by multiplying market betas (which proxy for cash flow volatility) with the net debt-to-equity ratio. Our line of reasoning is that firms with high volatility in cash flows have low debt tolerance and vice versa. If the cash flow volatility and the indebtedness are both high, we may expect that the firm has financial distress issues which will be alleviated by an equity increase, thereby increasing firm value. If on the other hand, the cash flow volatility and the indebtedness are both low, we may expect that the firm could benefit from additional leverage rather than an equity issue, in which case the announcement will negatively impact firm value. In line with optimal capital structure theory, the positive loading on the capital structure measure captures the benefits of increasing equity to excessively indebted firms, while the negative effect is included in the constant of the model. We strongly believe that research along these lines with more sophisticated measures for debt tolerance can provide valuable insights to investors and firms alike.

Overreaction

Visual inspection of the indexed abnormal return development presented in Graph 6 suggests an overreaction pattern, for which we propose several explanations. Our event study (Section 6.1) finds average abnormal returns of positive 2.9% for the five-day-period before prospectus and negative -7.3% for the five-day-period after. The downward movement then overcompensates for the initial increase, but within two weeks the curve returns to its (what appears to be a) pre-event downward trend. If it could be shown that specific positive information reached the market on the two days preceding announcement (for which daily abnormal returns were significantly different from zero, see Table 7) a case could be made for such leakage instigating the increase. Otherwise it would have to be assumed that investors were aware of the release date and traded up the stock in its anticipation. A possible albeit hard to substantiate explanation for this could include various short-term trading strategies.

The subsequent share price plummet could possibly be a delayed reaction to the information in the prospectus, correcting the optimistic beliefs. This delay would violate the assumption of efficient markets, however, prospectuses are large documents and it may require some time for prices to adjust.¹⁸ Regardless of what causes the increase, the reversal in share prices could simply be a response to the increase itself. Regression results in Table 13 show strong and significant inverse relationships between near term share price performance and returns on the following days of trading. It seems that share prices are negatively autocorrelated, a key implication of virtually every overreaction theory according to Lo & MacKinlay (1990), entailing that prices are predictable from past prices alone and violating weak form market efficiency. The indication is highly interesting and a larger study is warranted to study the effect.

Guarantees

While we found no statistically significant abnormal returns to prospectus filings for the entire data set, our fully guaranteed subsample showed a significant 1.8% average increase on prospectus announcement coupled with a negative -1.0% average return for the remaining subsample (Table 9). Fully guaranteed issues accordingly experience a 2.8 percentage point higher return on average which would lend support to the certification hypothesis. However, when making such a claim we must consider the possibility of reverse causality; the firms who receive full underwriting may very well have different characteristics than those who do not, which could account for the difference in performance. The extended view of subsample abnormal returns (Graph 8) in no way constitutes definite evidence either way, but does show firms with fully underwritten issues consistently performing better than those without following the issue. This would not follow from a one-time price adjustment, instead it points to the ability to use issue proceeds well and achieve higher returns than they did during the estimation window – the opposite is true for the remaining subsample.

In the extended view it appears that the curves start to diverge around 40 days after the prospectus, which may or may not coincide with firms getting access to the issue proceeds. Prior to this point however the curves develop similarly, an observation that can also be made in Graph 7. On the filing date the subsamples experience disparate

¹⁸ It should be noted that even if there are investors who process the signal in the prospectus faster, these investors may not be large or many enough to correct prices in the presence of less informed trading.

returns as discussed, only to move in tandem after that. This may suggest that guarantee extent is in fact on average new information released through the prospectus and signaling investors of positive things to come. Finally, we believe that the signal of full guarantees is a fact considered positive by private investors who know that there are large institutions betting on the same horse. Whatever the reason for the divergence in share prices illustrated in Graph 8, the size of the performance gap between averages of fully guaranteed and the remaining issues is striking and much larger than what we had anticipated.

8. CONCLUSION

The choice between internal financing and raising external capital is influential for firm value, and SEO announcements have been shown to elicit different reactions depending on institutional setting. The Swedish rights issue process is characterized by releases of preliminary issue terms, culminating in the filing of a prospectus that conveys new information and finalizes issue terms. Previous studies have investigated abnormal returns to SEO announcement, why a knowledge gap exists for the reaction on the prospectus date. Furthermore, the use of underwriting has become an increasingly important tool in ensuring the success of equity offerings and a trend of fully underwritten offerings is noted internationally. Our thesis aimed to give insights in both these aspects of the Swedish SEO process.

We find that there is an overreaction pattern in share prices surrounding the publication of prospectuses. Firms on average trade up during the five-day period immediately preceding the release and strongly rebound during the five-day period after the release window. This reversion of recent performance is vexing and we find no clear cut rationale for why it occurs. No unilateral effect is attributable to prospectus announcements in general and we therefore conclude that the prospectus is not a signal in its own right, but only conveys firm specific information.

We also observe that fully guaranteed issues significantly outperform those which are not, both on the prospectus announcement date and during an extended 140-day period after the offering. The difference is much larger than expected and the size of the price gap between fully guaranteed and remaining offers is striking. As high quality firms may more easily find guarantees, reverse causality is likely to account for some of this difference in performance. Still, the stronger performance of fully guaranteed issues has theoretical support and appears on the date of the prospectus, why we feel confident to conclude that the guarantee itself is a positive signal to the market.

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APPENDIX

A1: COLLECTED CROSS-SECTIONAL DATA

List of all variables collected from the prospectuses of 90 rights issues on OMX Stockholm during the period 2007-2012. All variables but no. 7 were collected manually from the prospectuses. Disc. column is marked x when the variable may have been estimated at the discretion of the thesis' authors.

Variable	Unit of measurement	Period	Disc.	Description
<i>Financial variables</i>				
1. Total assets	MSEK	Last reported		Total assets on balance sheet.
2. Total equity	MSEK	Last reported		Total shareholders equity including minority.
3. Revenue	MSEK	Last financial year		Net revenue.
4. Net debenture	MSEK	Last reported		Interest bearing debt less financial assets.
5. Number of shares before SEO	#	Last reported		Weighted and diluted measure.
6. Number of shares after SEO	#	Last reported		Weighted and diluted measure.
7. Beta	Scalar	5 years before event window		Bloomberg adjusted beta of monthly returns relative to OMXS All-Share Index over 5 years.
<i>Industry classification</i>				
8. GICS classification (where possible)		n/a	x	Global Industry Classification Standard where such is available, or best fit.
<i>Ownership variables</i>				
9. Largest shareholder	%	Prospectus		Percentage of share capital owned by the largest owner.
10. Blockholders	%	Prospectus		Number of shareholders with more than 5% of share capital.
11. Free float	%	Prospectus		Percentage of share capital not owned by largest shareholder or blockholders.
<i>Issue terms variables</i>				
12. Issue price	SEK	Prospectus		Price of new shares sold in the offering.
13. Total issue costs	MSEK	Prospectus		Total costs related to the equity offering, including underwriting fees.
14. Specific use	Dummy	Prospectus	x	Dummy variable indicating if the proceeds of the issue are intended for a certain offensive use (M&A, product development or new market entrance).
<i>Guarantee variables</i>				
15. Shareholder commitments	%	Prospectus		Percentage of the equity offering guaranteed to be sold without remuneration to the buyer.
16. Underwriting extent	%	Prospectus		Percentage of the equity offering guaranteed to be sold with remuneration to the buyer.
17. Underwriting fee	%	Prospectus		Remuneration as percentage of the value of underwritten equity.
18. Lead commitment	Dummy	Prospectus		Dummy variable indicating that the financial advisor drafting the prospectus is also an underwriter of the offering.

A2: LIST OF INCLUDED OFFERINGS

List of all included seasoned equity offerings during the period 2007-2012.

no.	Company	Prospectus date	no.	Company	Prospectus date
1.	Wilhelm Sonesson	2007-01-10	46.	Biovitrum	2009-12-09
2.	Active Biotech	2007-01-19	47.	Cision	2010-03-22
3.	Teligent	2007-02-05	48.	Borås Wäfveri	2010-03-26
4.	ScanMining	2007-03-13	49.	Geveko	2010-04-07
5.	Elanders	2007-03-15	50.	SAS	2010-04-09
6.	Karo Bio	2007-04-12	51.	Note	2010-04-16
7.	Cybercom	2007-09-10	52.	Micronic Mydata	2010-04-29
8.	Teligent	2007-09-13	53.	Medivir	2010-05-03
9.	CTT Systems	2007-11-26	54.	PA Resources	2010-05-27
10.	Getinge	2008-02-27	55.	Elanders	2010-08-26
11.	Teleca	2008-03-27	56.	Mobyson	2010-09-02
12.	Active Biotech	2008-05-14	57.	Artimplant	2010-09-24
13.	IBS	2008-06-05	58.	Oasmia	2010-11-01
14.	Biophausia	2008-08-08	59.	Corem	2010-11-03
15.	Retail and Brands	2008-09-01	60.	Diös	2010-11-04
16.	Morphic Technologies	2008-09-29	61.	Sensys Traffic	2010-11-04
17.	Opcon	2008-10-07	62.	Karo Bio	2010-11-25
18.	Meda	2008-11-05	63.	Hexagon	2010-11-29
19.	Aerocrine	2008-11-12	64.	Eniro	2010-12-01
20.	Fingerprint Cards	2008-11-20	65.	Hexpol	2011-02-25
21.	Vostok Nafta	2009-01-15	66.	Digital Vision	2011-03-10
22.	SEB	2009-03-10	67.	Hemtex	2011-03-24
23.	Husqvarna	2009-03-11	68.	Precise Biometrics	2011-05-03
24.	Nordea	2009-03-17	69.	Sobi	2011-05-05
25.	SAS	2009-03-18	70.	Orexo	2011-05-30
26.	A-Com	2009-04-20	71.	Allenex	2011-09-26
27.	Hemtex	2009-04-27	72.	Opcon	2011-10-12
28.	Trelleborg	2009-04-28	73.	TransAtlantic	2011-11-09
29.	LinkMed	2009-05-12	74.	Image Systems	2012-02-21
30.	Active Biotech	2009-05-15	75.	BioInvent	2012-03-13
31.	Cybercom	2009-05-28	76.	Cloetta	2012-03-13
32.	Eniro	2009-05-29	77.	Aerocrine	2012-04-17
33.	Precise Biometrics	2009-08-24	78.	FormPipe Software	2012-06-13
34.	Billerud	2009-09-01	79.	Nordic Mines	2012-06-20
35.	Swedbank	2009-09-18	80.	Aspiro	2012-08-15
36.	Fingerprint Cards	2009-09-21	81.	Precise Biometrics	2012-09-12
37.	Diamyd Medical	2009-10-14	82.	Cybercom	2012-10-08
38.	Karo Bio	2009-11-11	83.	Oasmia Pharmaceuticals	2012-10-25
39.	Biolin Scientific	2009-11-17	84.	Opcon	2012-11-15
40.	Ticket Travel Group	2009-11-23	85.	Black Earth Farming	2012-11-16
41.	Midelfart Sonesson	2009-11-25	86.	Karo Bio	2012-11-26
42.	A-Com	2009-11-26	87.	Billerud	2012-11-29
43.	Haldex	2009-11-27	88.	KappAhl	2012-11-30
44.	Gunnebo	2009-11-30	89.	Seamless	2012-12-06
45.	TradeDoubler	2009-12-08	90.	Nordic Mines	2012-12-28
			91.	Bergs Timber	2012-11-21

Please note that Bergs Timber was excluded from our main study, for more details see Appendix A4.

A3: CLUSTERING ANALYSIS

In order to control for issues with clustering we have conducted an analysis also for a subsample of offerings which do not occur within 2 days proximity of another offering. Graph 12 and Tables 13 and 14 show that for all intents and purposes the inferences are the same either way. Regression analysis also shows that adding a proximity control to our main model adds no explanatory value. For these reasons, clustering does not seem to be an issue for inferences from the event study and the regression analysis.

Graph 9 - Event study comparing entire and non-clustering sample

Indexed average abnormal returns for the entire sample of 90 rights offerings in Sweden during the period 2007-2012 and a subsample of non-clustering observations. Index 100 at $t = -6$.

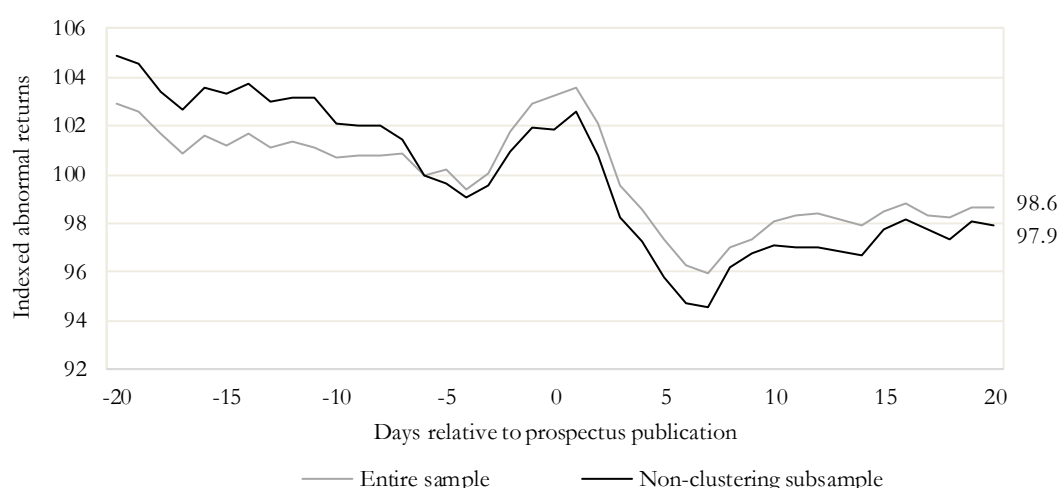


Table 13 - Event study results for non-clustering subsample

Results for three t-tests in the non-clustering sample of 66 rights issues compared to the entire sample of 90 rights issues. Tests are performed on each of our event window CARs, with the null hypothesis that CARs are equal to zero.

<i>Interval</i>	<i>2-day</i>	<i>5-day before</i>	<i>5-day after</i>
<i>Non-clustering subsample</i>			
CAR	0.64%	1.96%*	-7.69%***
Standard error	0.77%	1.22%	1.22%
p-value	0.4076	0.1135	0.0000
<i>Entire sample</i>			
CAR	0.61%	2.94%***	-7.28%***
Standard error	0.68%	1.08%	1.08%
p-value	0.3739	0.0079	0.0000

*** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$

Table 14 - 2-day prospectus announcement CARs regression

Cross-sectional regression on 89 rights issues during the period 2007-2012. The 2-day prospectus cumulative abnormal returns regressed in two models. (2) main regression model and (3) main model including proximity control.

Model	Model II	Model III
<i>Size (%)</i>	0.0109*** (0.0018)	0.0109*** (0.0017)
<i>Discount (%)</i>	0.1300*** (0.0419)	0.1300*** (0.0441)
<i>Capital structure (Beta * NDE)</i>	0.0041* (0.0024)	0.0041* (0.0024)
<i>5-day pre-prospectus CAR (%)</i>	-0.2660*** (0.0779)	-0.2660*** (0.0784)
<i>Crisis (D)</i>	-0.0273* (0.0155)	-0.0273 (0.0165)
<i>Proximity (D)</i>		0.0000 (0.0204)
<i>Constant</i>	-0.0285* (0.0151)	-0.0285* (0.0155)
<i>Observations</i>	89	89
<i>R²</i>	0.303	0.303

Robust standard errors in parentheses. D denotes dummy variable.

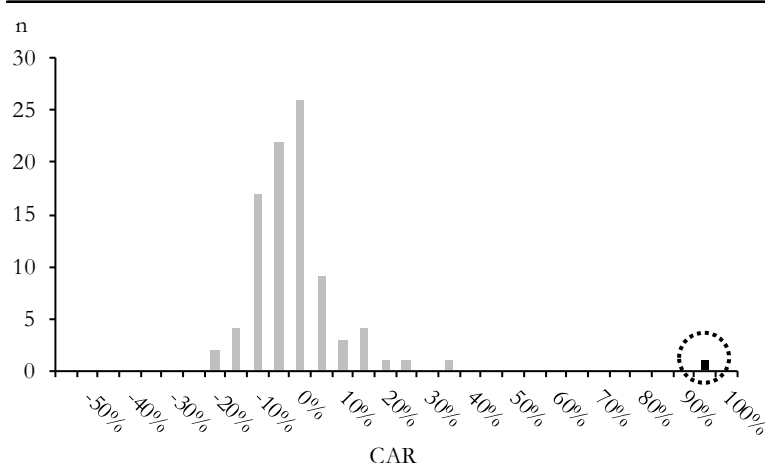
*** p<0.01, ** p<0.05, * p<0.1

A4: DROPPED DATA

Aggregating abnormal returns to average figures in a sample of only 91 observations means that one extreme value may cause a large change in the results of our study. The inclusion of the 2012 rights issue in *Bergs Timber* would increase our cumulative abnormal returns on prospectus announcement by more than 1% and has been dropped in our main results. Graph 13 contains a histogram of two-day CARs with Bergs Timber's 95.9% observation in black.¹⁹

Graph 10 - Distribution of 2-day CARs including Bergs Timber

Histogram in 5% intervals showing distribution of CARs for entire sample of 90 rights offerings in Sweden during the period 2007-2012 in grey and the dropped Bergs Timber observation in black.



In Table 15 are the summaries from the event studies for which Bergs Timber is included and excluded. Bergs Timber would in its own right make the event study significant, which is why the observation has been excluded from our main results.

Table 15 - Event study summary with and without Bergs Timber

Results for three t-tests with and without including Bergs Timber to the entire sample of 90 rights issues. Tests are performed on each of our event window CARs, with the null hypothesis that CARs are equal to zero.

Interval	2-day	5-day before	5-day after
<i>Excluding bergs timber</i>			
CAR	0.61%	2.94%**	-7.28%**
Standard error	0.68%	1.08%	1.08%
p-value	0.3739	0.0079	0.0000
<i>Including Bergs Timber</i>			
CAR	1.66%**	3.39%***	-7.47%***
Standard error	0.69%	1.09%	1.09%
p-value	0.0186	0.0026	0.0000

*** p<0.01; ** p<0.05; * p<0.1

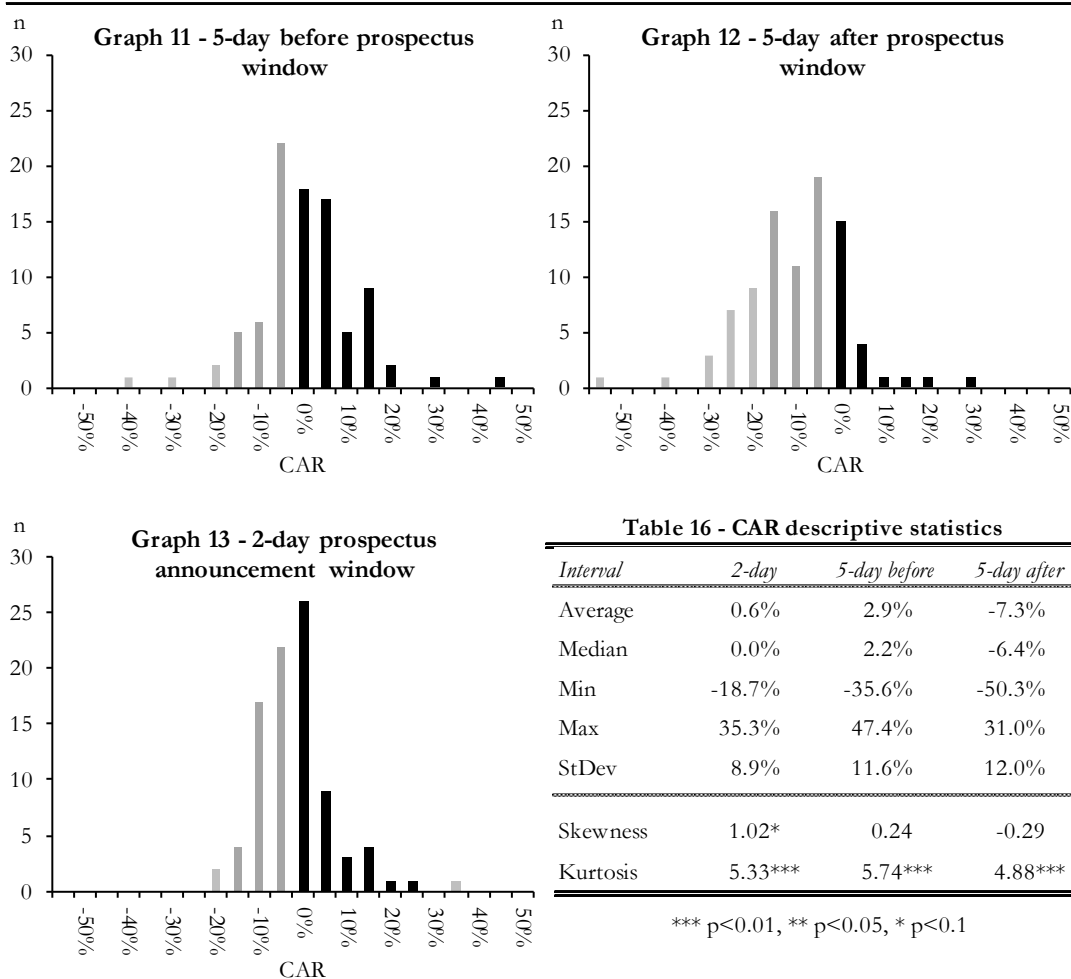
¹⁹ Examination of press releases on the corporate website has shown that Bergs Timber moved the reporting date of their annual report to the same date as the prospectus filing. This may in part explain the extreme movement.

A5: CAR DISTRIBUTIONS

Graphs 11-13 show histograms of CAR distributions for the entire data set of 90 observations. Detailed information in Table 16 shows that we may reject normality assumptions for the cumulative abnormal returns for all event windows at the 5% significance level.

Graph 11, 12, 13 - Distribution of CARs in entire sample for three event windows

Histogram in 5% intervals describing distribution of CARs for entire sample of 90 rights offerings in Sweden during the period 2007-2012. Divided into three windows surrounding the prospectus announcement. Black bars are positive values and grey negative values.



The large returns to stocks surrounding the event date suggest that there are clear effects from the issuance of a prospectus even though average and median figures on two-day announcement are close to zero.