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Stock price reactions to Swedish rights offerings: Do investors underreact?

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Abstract

This paper studies 527, hand-collected, Swedish rights offerings announced over the period January 2007 to December 2016. The results differ from previous studies on rights offerings announcements on small markets, where we find that the announcement of SEOs lowers the stock price of the issuing firms. Moreover, by using a novel approach, we find evidence that the effect from announcing SEOs is not instantaneously incorporated in the stock price. In the six months following the completion of issue, prices continue to drift in the same direction as the announcement abnormal returns, though the drift is only significant for uninsured rights. Hence, our results for uninsured rights are in line with the behavioral theory of underreaction. The underreaction hypothesis is supported by two separate models, the CAR and BHAR model, suggesting that the anomalies detected are not fragile. However, we find that the negative drift is driven by specific years in the sample and is concentrated among larger firms, which raises questions of the economic significance of the anomalies found. The underreaction pattern observed may merely be a manifestation of what Fama refers to as chance.

Keywords: Rights offerings, behavioral finance, stock price performance, drift, underreaction.

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Table of contents

1. Introduction 1
2. Theoretical framework 3
2.1 Theory 3
2.1.1 The efficient market hypothesis (EMH) 3
2.1.2 Behavioral finance 3
2.2 Previous research 5
2.2.1 Research on initial market reactions around the announcements of SEOs 5
2.2.2 Research on post-announcement stock price performance 6
3. Hypothesis development 9
3.1 Stock price performance around SEO announcements 9
3.2 Post rights offering drift 9
3.3 Test of the underreaction hypothesis 10
4. Data 10
4.1 The sample 10
4.2 Descriptive statistics of variables 13
5. Methodology 14
5.1 Definition of the estimation window 14
5.2 Definition of the event windows 15
5.3 Computation of abnormal returns 17
5.4 Cross-sectional analysis 19
6. Results and discussion 20
6.1 Announcement abnormal returns 20
6.2 Drift window abnormal returns 22
6.3 Does the market underreact to SEO announcements? 24
6.3 Additional analysis 28
7. Conclusion 30
7.1 Further research 31
Bibliography 32

1. Introduction

The efficient market hypothesis implies that investors adjust their expectations instantaneously with respect to new information, which in turn is reflected in stock prices (Fama *et al.,* 1969). Although widely renowned, researchers have registered several anomalies that are inconsistent with the efficient market hypothesis, one of them being the post earnings announcement drift (Zhang, 2008), which can be seen as the Grandmother of underreaction anomalies. The post-earnings-announcement-drift (from now on PEAD) was first written about by Ball and Brown (1968) and Bernard and Thomas (1989) define it as the stock of firms with unexpectedly high or low earnings tend to drift in the direction of the earnings surprise after the announcement. Evidence of stock price drift has also been reported following other corporate events. For share repurchases, the stock price jumps at the announcement and then continue to drift upwards for several years afterward (Ikenberry *et al.*, 1995). Furthermore, the findings of Michaely *et al.* (1995) give evidence for drift following dividend initiations and omissions and drift is also found for stock splits (Ikenberry *et al.*, 1996). Lastly, several papers on equity flotation methods document drift of stock prices following seasoned equity offerings[1] in the U.S. (for example, Loughran and Ritter, 1995; Spiess and Affleck-Graves, 1995; and Burch *et al.*, 2004).

Ritter (2003) argues that the long-run[2] drift evidence following seasoned equity announcements implies that equity issuances are met with an underreaction from the market. In the U.S., seasoned equity offerings are met with a negative market reaction (Masulis and Korwar, 1986). Hence, the underreaction hypothesis predicts that the drift abnormal returns should be negative, which is the general finding (e.g., Spiess and Affleck-Graves, 1995). The research body supporting market inefficiency theories is conducted on firm commitments, and to our knowledge, no evidence of the underreaction phenomenon has been documented for rights offerings.

[1] Common methods of selling seasoned equity is through the use of firm commitments and rights offerings (Eckbo *et al.*, 2007). A firm commitment offer is guaranteed in whole by an underwriter who contractually commits to purchase the entire equity issue and organizes the sale of the shares to the public (Hansen, 1988). Rights offerings are directed to current shareholders and can be insured or uninsured; where insured, also called standby rights offering, implies that the rights offering is underwritten by an underwriter committed to purchase unsubscribed shares (Cronqvist and Nilsson, 2005).

[2] Long-run performance is defined as the abnormal returns estimated over a period of one-year horizon or longer (Barber and Lyon, 1997; and Eckbo *et al.*, 2007). Short-term performance is directly linked to the corporate event announcement, where event windows may vary, although typically larger than just one day (MacKinlay, 1997). Mid-term performance is defined as abnormal returns estimated over a period longer than the immediate market reaction window, but shorter than what is defined as long run performance.

We will examine whether stock price performance following rights offerings by Swedish issuers is explained by the underreaction hypothesis. The results may develop our understanding of the effect on shareholder value from firms issuing rights. If the market fails to incorporate information in stock prices instantaneously, markets are not efficient. Thus, traditional short-window event studies around the announcement fail to provide an unbiased estimate of the effect on shareholder value from rights offering announcements. In order to examine whether the underreaction hypothesis is a valid explanation of our results, both announcement and drift abnormal returns will be investigated. Similarly to the majority of researchers (e.g., Spiess Affleck-Graves 1995), the drift abnormal returns will be estimated from shortly after the announcement date, but we will also, as Burch *et al.* (2004), estimate the drift abnormal returns from after the completion of the rights issue. Following rights offerings, new information is successively released to the market during the trading and subscription period of rights. Previous research highlights abnormal returns of different signs during the rights offering period (Hansen, 1988; and Eckbo and Masulis, 1992), suggesting that estimating drift from after the completion of the issue will limit noise in the estimates, compared to estimating drift from the announcement date. Our main contribution is that the post-outcome drift abnormal returns are measured in a novel way, which differs from previous papers since we have tailor-made the event windows, to reflect each individual issue's outcome date instead of using a pre-specified range for all offerings. Outcome dates are hand-collected for each individual issue, allowing for more accurate estimates. Moreover, inspired by Fama's (1998) critique of long-term models as well as related research on drift following corporate events (Ball and Brown, 1968; Michaely *et al.*, 1995; and Ritter, 2003), we will limit the drift window to a horizon of three and six months, where drift has been found to be prominent (Bernard and Thomas, 1989).

Our thesis is structured as follows: chapter two provides the theoretical structure and a literature review of studies conducted on seasoned equity offerings. Chapter three outlines our hypotheses, whereas chapter four and five present the sample selection criteria and provide relevant statistics of our data, as well as describe the event study and cross-sectional regression methodology used in our analysis. Lastly, chapter six contains the analysis of the results and chapter seven concludes.

2. Theoretical framework

This chapter provides the theory underpinning the research on seasoned equity offerings. Section 2.1 presents the efficient market hypothesis and its main criticizer behavioral finance, whereas section 2.2 presents a selection of previous research on seasoned equity offerings.

2.1 Theory

2.1.1 The efficient market hypothesis (EMH)

In the 1960s, there was a growing body of research being written about the efficient market hypothesis (EMH). Eugene Fama's well-known article *Efficient Capital Markets* (1970) contains the theory of EMH, where the general definition of efficiency is "A market in which prices always "fully reflect" all available information is called efficient". Fama further states that in order for a market to be efficient investors have to be rational and maximizing wealth, no market participant can solely affect market prices, all information is available to all market participants and no transaction costs exist. However, since these requirements are more of a theoretical concept than a realistic model, Fama (1970) categorize market efficiency in the three categories; weak, semi-strong and strong form. Weak form efficiency gives that all historical information is in the available information set. The semi-strong form states that all publicly available information is in the information set, and prices immediately adjust to new information. Lastly, the strong form claims that all information, historical, public and private, is in the information set available to the market participants. Studies have shown that there are possibilities to earn abnormal returns, which imply that our markets today have a character of semi-strong form efficiency.

2.1.2 Behavioral finance

Research on market efficiency suggests that the topic might be more complex than assuming that market prices reflect all available information at all times. Behavioral finance is a relatively young topic in finance and it poses as a main criticizer of EMH. Behavioral finance extends financial concepts with theories of psychology and market frictions in order to explain the growing body of evidence of market inefficiency. Robert Shiller (2003), a behavioral finance advocate, argues that life is not as simple as assuming that EMH always holds. Shiller (2003) highlights that even Fama acknowledged stock return anomalies in 1970, although Fama (1970) argued they were too small to be of any significance.

A common explanation for deviations from the EMH is that investors may misinterpret the importance of new information, leading to inadequate reactions (Shiller, 2003). Inadequate reactions will in turn lead to prices deviating from its intrinsic value. Deviations from the EMH has been found following earnings announcements (Ball and Brown, 1968), dividend initiations and omissions (Michaely *et al.*, 1995), stock splits (Ikenberry *et al.*, 1996), as well as seasoned equity offerings (e.g. Loughran and Ritter, 1995). A general and accepted theory for the abnormally low stock returns following seasoned equity offerings does not exist. Theories underpinning the evidence of drift include the underreaction hypothesis, which implies that the market incorporates only part of the information content in the stock price at the announcement of the issue (Kang *et al.*, 1999). For an underreaction to be present, the abnormal returns for the announcement and drift period must be of the same sign (Ritter, 2003). Other theories mentioned in the behavioral research on abnormal returns following corporate events is the overconfidence hypothesis and overreaction theory. The overconfidence hypothesis, proposed by Daniel *et al.* (1998), extends the underreaction theory and is based on the assumption that investors are overconfident with regards to their own private information relative to public information. The theory predicts that the average abnormal returns, of a public event, for the announcement and drift period should be of the same sign and positively correlated (Eckbo *et al.*, 2007). The overreaction theory implies that investors overreact to the news content of the SEO. Overreaction is present when the announcement and drift abnormal return differ, and the announcement abnormal return is bigger in magnitude than the drift abnormal return (Ritter, 2003).

Critique of behavioral explanations is, as Fama (1998) points out, that there are no consistent patterns for long-term studies, which makes it hard to interpret the results. Long-term return anomalies are sensitive to methodology, where results become negligible or vanish when exposed to different statistical models and approaches (Fama, 1998). Moreover, Fama (1998) groups underreactions and overreactions together, and argues that the empirical results are as likely to show one or the other. Fama (1998) refer to this as chance. However, Daniel *et al.* (1998) do not agree with Fama's critique and retorts that some return patterns are of significance and of regular nature. They further argue that some anomalies occur in different geographies and in different time periods.

2.2 Previous research

2.2.1 Research on initial market reactions around the announcements of SEOs

Numerous papers have examined the announcement returns following seasoned equity offerings. Although rights offerings are close to non-existing in the U.S. market (Eckbo and Masulis, 1992), it is frequently used by European firms, where most seasoned equity offerings include some form of rights offering (Eckbo, 2008). Table 1 summarizes a selection of previous studies on market reactions around the announcement of SEOs.

Table 1: Summary of previous studies' findings on the market reaction around the announcement of SEOs

The table presents an overview of previous studies and their findings on the market reaction around SEO announcements. FC denotes firm commitment, SBR indicates standby rights offering, UR is uninsured rights and RU denotes rights undefined.

Author	Market	Period	Flotation Method	Expected Return Model	Event Windows	Number Of SEOs	CAR (%)
Masulis and Korwar (1986)	U.S. FC	1963-1980	FC FC	Market return benchmark	(0; 1) (0; 1)	388 584	-3.31*** -0.77***
Clarke *et al*. (2001)	U.S.	1984-1996	FC	Excess model	(-1; 1)	3092	-1.70***
Hansen (1988)	U.S.	1964-1986	SBR	Comparison-period method	(-1; 1)	80	-1.21***
Slovin *et al*. (2000)	U.K.	1986-1994	SBR UR	Market model	(-1; 0)	200 20	-2.90*** -4.96***
Gajewski and Ginglinger (2002)	France	1986-1996	UR SBR	Dimson's method	(0; 1) (0; 1)	57 140	- 1.11*** - 0.74**
Gebhardt *et al*. (2001)	Germany	1981-1990	RU	Market model	(-1;0)	190	-0.08
Dang and Yang (2013)	China	2002-2004	RU	Market model with conditional factor	(-1; 0)	26	-0.01***
Marinova *et al.* (2014)	U.S. EU	2007-2013 2007-2013	-	Market model	(-1; 1) (-1; 1)	111 74	-0.82** -2.61***
Li *et al.* (2016)	U.S.	1982-2012	-	And non-bank benchmark	(-1; 1)	375	-0.61***
Kang (1990)	Korea	1984-1988	UR	-	(0; 1)	89	0.95*
Tan *et al*. (2002)	Singapore	1988-1996	RU	Market model	(0; 0)	65	1.65**
Eckbo and Norli (2004)	Norway	1980-1996	SBR UR	Market model with conditional factor	(-1; 0) (-1; 0)	143 76	- 0.58 0.95*
Cronqvist and Nilsson (2005)	Sweden	1986-1999	UR SBR	Market model	(-1; 1) (-1; 1)	107 53	0.19 0.72
Ariff *et al.* (2007)	Singapore	1983-2003	RU	Market model	(0; 1)	139	4.14***

***, ** and * denote the significance at the 1%, 5% and 10% level respectively.

The announcement effect of firm commitments has been shown to have a negative impact on stock return (Masulis and Korwar, 1986; and Clarke *et al.*, 2001). This finding is generally considered to be consistent with the information asymmetry hypothesis proposed by Myers and Majluf (1984), where issuing firms are viewed as overvalued due to problems of adverse selection. Levis (1995) argues that rights offerings reduce the adverse selection problem, as the new shares are targeted towards current shareholders, resulting in weaker relationship between announcement effect and first day returns. Moreover, Burch *et al.* (2004) find that rights do not exhibit the same negative trend as firm commitments, suggesting that rights are not market timed. Eckbo and Masulis' (1992) shareholder takeup model is among the first to describe the difference in market reactions between firm commitments, standby rights and uninsured rights. They conclude as Levis (1995) that firm commitments should exhibit a more negative market reaction compared to rights offerings. Their model further predicts that standby rights should be followed by a market reaction of a magnitude in between firm commitment and uninsured rights, since the expected shareholder takeup is lower for standby rights compared to uninsured rights.

International evidence outside the U.S. reports different results for rights offerings. Eckbo and Norli (2004) find a significant and positive market reaction for uninsured rights offerings in Norway. This result is consistent with findings from research on smaller equity markets like Korea (Kang, 1990) and Sweden (Cronquist and Nilsson, 2005). The same findings do not hold for larger markets, such as France and the U.K., where a negative market reaction is associated with the same type of rights offering (Slovin *et al*., 2000; Gajewski and Ginglinger, 2002). The same pattern emerges for standby underwritten rights as well, where small markets experience a neutral or positive market reaction (Norway and Sweden) (Eckbo and Norli, 2004; and Cronquist and Nilsson, 2005), and a negative market reaction emerges in larger markets (the U.K., the U.S. and France) (Slovin *et al.*, 2000; Hansen, 1988; and Gajewski and Ginglinger, 2002).

2.2.2 Research on post-announcement stock price performance

The research conducted on event windows post the announcement date of the SEO, challenges the assumption of capital markets efficiency. The drift evidence implies that traditional studies on short-term market reactions around the announcements capture only part of the impact of corporate actions on firm value (Jegadeesh, 2000). The research body on abnormal returns following seasoned equity offerings is summarized in Table 2.

Table 2: Summary of previous studies' findings on stock price performance following SEOs.
The table presents an overview of previous studies and their findings on post-announcement stock price performance. FC denotes firm commitment, SBR indicates standby rights offering, UR is uninsured rights and RU denotes rights undefined.

Author	Market	Period	Flotation Method	Expected Return Model	Event Windows	No. of SEOs	Measure	%
Loughran and Ritter (1995)	U.S.	1970-1990	-	Matched index benchmark	(0; 1,095)	3,702	Wealth relative	0.78
Spiess and Affleck-Graves (1995)	U.S.	1975-1989	FC	Matched firm benchmark	(1; 1,080)	1,116	CAR	-17.51**
Clarke *et al*. (2001)	U.S.	1984-1996	FC	Matched portfolio benchmark	(1; 1,080)	3092	BHAR	-14.3***
Brav *et al*. (2000)	U.S.	1975-1992	FC FC	Matched index benchmark	(1; 1800) (1; 1800)	3775 3775	CAR BHAR	-15.4 -26.3
Eckbo *et al*. (2000)	U.S.	1964-1995	FC	Matched portfolio benchmark	(1; 1800)	3851	BHAR	-26.9***
Jegadeesh (2000)	U.S.	1970-1993	-	Matched portfolio benchmark	(1; 1800)	2992	BHAR	-55.4***
Burch *et al*. (2004)	U.S.	1933-1949	FC RU FC RU	Matched, index benchmark	(60; 390)	79 186 79 186	CAR CAR BHAR BHAR	-14.1*** -3.4 -13.5*** -4.2
Andrikopoulos (2009)	U.K.	1988-1998	RU	Matched portfolio benchmark	(1; 1,080)	1,542	BHAR	-26.2***
Kang *et al.* (1999)	Japan	1980-1988	FC RU	Matching firm benchmark	(1; 1,080) (1; 1,080)	727 51	BHAR BHAR	-22.10** -10.29
Jeanneret (2005)	France	1984-1998	RU	Matching firm benchmark	(1; 1,080) (1; 1,080)	232 232	BHAR BHAR	-18.2* -4.6
Dang and Yang (2013)	China	2000-2001	RU	Matched market index	(1; 720)	129	BHAR	-13.4***
Eckbo and Norli (2004)	Norway	1980-1993	SBR UR	Matched benchmark	(0; 1,095) (0; 1,095)	143 147	BHAR BHAR	-22.2* -10.4
Kim *et al.* (2015)	Korea	2005-2010	-	Matched portfolio benchmark	(1; 720)	734	BHAR	-10***

***, ** and * denote the significance at the 1%, 5% and 10% level respectively.

The majority of the research in Table 2 concludes that issuing firms experience negative abnormal returns in the period after the announcement of the offering. Papers that study abnormal returns following SEO announcements can be divided in two branches, where one research body argues that the abnormal returns are a result of market inefficiency, whereas the remaining researchers state that the abnormal returns are rather driven by faulty benchmarks as well as bad model problems that grow over the estimation horizon (Fama, 1998). Moreover, Brav *et al.* (2000) document that small firms experience larger negative abnormal returns relative to large firms and therefore argues that the underperformance following SEOs is not a persistent phenomenon. Responding to this, Levis (1995) and Jegadeesh (2000)

present evidence that the post-SEO announcement returns are robust for using different benchmarks and models. Lastly, Burch *et al.* (2004) find that the post-issue stock price performance is robust to controlling for various firm characteristics as well as offering attributes, which suggest that the abnormal returns following firm commitments are due to market timing and market inefficiency rather than bad model specifications.

The research body arguing that the abnormal returns are a result of market inefficiency, suggests that the market fails to impound the information conveyed by the announcement of the corporate event instantaneously (Kang *et al.,* 1999). This is based on evidence from SEO studies as well as research on other firm events such as share repurchases, cash-financed acquisitions, stock-financed acquisitions and dividend changes (Kadiyala and Rau, 2004; Ritter 2003; Ball and Brown, 1968; Bernard and Thomas, 1989; Ikenbery *et al.,* 1995; Michaely *et al.,* 1995; and Ikenberry *et al.,* 1996). The majority of the research on stock price performance following SEOs supports the behavioral theory of underreaction, hence, that the initial market reaction and the drift abnormal returns have the same sign (Ritter, 2003). Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) research shows negative drift following the announcement of firm commitments, which together with the U.S. evidence of negative short-term market reactions, support the underreaction theory. Clarke *et al.* (2001) investigate firm commitments and report significant negative abnormal announcement returns followed by negative long-term abnormal returns, which is further evidence in favor of the underreaction hypothesis.

The underreaction hypothesis has yet to be proven for rights offerings. Burch *et al.* (2004) find no support for long-term abnormal performance following U.S. rights issuers, suggesting that the underreaction hypothesis does not hold for rights offerings. The same result emerges for Norway, where Eckbo and Norli (2004) find no support for the underreaction hypothesis, for both standby and uninsured rights. Moreover, Eckbo and Norli (2004) test the overconfidence hypothesis on rights offerings, but their findings show no evidence of this type of market inefficiency. Important to note is that all of the above papers estimate abnormal returns over long horizons, which have been heavily criticized (Fama, 1998), suggesting that long-run models may not be the best approach to test market inefficiency. Moreover, the studies on rights offerings are often estimated from the announcement date, which can be problematic as issue-specific events during the offering period might introduce noise in event windows.

3. Hypothesis development

In order to examine whether the stock price performance following rights offerings by Swedish issuers is explained by the underreaction hypothesis, we will analyze the abnormal returns around the announcement and for the drift period. Rights offerings differ from firm commitments in the sense that probability of offer failure is present, the shares are directed to current shareholder who subscribe and trade the rights during a predetermined period, and the subscription success rate is revealed later after the completion of the offer. Given that these issue-specific events may cause noise in traditional event windows estimated from the announcement date, we intend to analyze the drift of the offering from both the announcement date and outcome date.

3.1 Stock price performance around SEO announcements

The literature review on market reactions after rights offerings is indecisive. For small markets, comparable to the Swedish market, some researchers report positive abnormal returns (Eckbo *et al.,* 2007), while others find no significant abnormal returns (Cronqvist and Nilsson, 2005; and Böhren *et al.,* 1997). We will remain conservative instead of forming a directional hypothesis for the full sample.

- $H1_0$: The announcement abnormal returns for rights issuing firms is zero.
- $H1_1$: The announcement abnormal returns for rights issuing firms is different from zero.

3.2 Post rights offering drift

The drift of the rights offerings will be analyzed from both the announcement and outcome date of each individual offering. We expect when employing mid-term windows, as motivated by PEAD research and critique of long-term models, that drift will be present for rights offerings, consistent with research on drift following other corporate events (Ball and Brown, 1968; Ikenbery *et al.,* 1995; Michaely *et al.,* 1995; and Ikenberry *et al.,* 1996).

- $H2_0$: The mid-term stock price performance following the rights offerings do not demonstrate any abnormal returns.
- $H2_1$: The mid-term stock price performance following the rights offerings demonstrate abnormal returns.

3.3 Test of the underreaction hypothesis

The underreaction hypothesis is among the behavioral theories adopted when explaining stock price performance following seasoned equity offerings. Researchers have shown that the announcement and post-issue abnormal returns are consistent with this behavioral theory in the U.S. (e.g., Ritter, 2003; and Clarke *et al.,* 2001). We will investigate whether the underreaction pattern, where prices slowly adjust over time to the information content of the SEO announcement, can explain our results.

- $H3_0$: The announcement abnormal returns and the drift window abnormal returns do not have the same sign.
- $H3_1$: The announcement abnormal returns and the drift window abnormal returns have the same sign.

4. Data

This chapter will describe the data used for the analysis. More specifically, section 4.1 presents the sample selection as well as the characteristics of rights issuers in the sample and section 4.2 presents the descriptive of all event windows and variables used in the analysis.

4.1 The sample

The sample consists of all firms listed in the Swedish market that announced a rights offering in the 10-year period from January 2007 to December 2016. Consequently, all private placements, firm commitments, convertible issues and shelf registration issues are excluded from the sample. There has been no exclusion based on listed security exchange[3]. The sample fulfilling the selection criteria consists of 897 rights offerings. Announcement dates, as well as subscription and outcome dates, were hand-collected from Bloomberg, Finansinspektionen and publications from Swedish stock exchanges.[4] Rights offerings including convertible debt issuances (7), as well as unit offerings including some form of convertible debt (1), have been omitted from the sample. Furthermore, regarding issuers, we have excluded banks and

[3] Stock exchanges present in the sample are Aktietorget (202 offerings), Nordic GM (53 offerings), First North (151 offerings) and Nasdaq Stockholm (120 offerings).
[4] Details related to the issues, such as offer type, firm size etc. are collected from Bloomberg, Skatteverket and each firm's individual prospectus and press releases.

insurance companies (10).[5] Another exclusion was made for rights offerings where prospectus and/or press releases regarding the outcome of the offering were missing (298). Moreover, like Eckbo and Norli (2004), we have excluded issues with less than four months of data prior to the announcement date (7). Thus, the sample is restricted to firms having sufficient time series data in the estimation and event window. These restrictions reduced our sample size to 574 rights offerings.

Similar to other studies on abnormal returns following SEOs (e.g., Kang *et al.,* 1999), we will trim variables showing non-normal distributed characteristics. Daily stock returns are characterized by non-normality, which implies that our dataset might suffer from high leverage data points (Brown and Warner, 1985). Thus, excluding outliers is preferable in order to ensure that the data do not have a non-normal distribution (MacKinlay, 1997) such that results may be skewed by extreme values (Sorokina *et al.,* 2013)[6][7]. The conclusions drawn from the data are not affected when outliers are taken into account, but the magnitudes differ. After removing the one per cent of the most extreme values of variables showing high degree of skewness and kurtosis the sample consists of 527 observations[8]. Table 3 summarizes the characteristics of the full sample and the two rights offer categories.

Table 3: Characteristics of rights issuers in the sample, 2007-2016

	Full sample		**Standby rights**		**Uninsured rights**	
	Mean	Median	Mean	Median	Mean	Median
Market cap (SEKm)	736	75	899	152	709	71
Offering size (SEKm)	161	22	420	44	118	20
Relative size of issue	48%	30%	72%	38%	44%	30%

The number of rights offerings in the sample are 527, where 452 rights offerings are uninsured and 75 rights offerings have standby underwriting. Market capitalization is extracted based on the announcement day, whereas offering size is retrieved from each firm's prospectus. Relative size of issue is simply the quote value between offering size and market capitalization.

[5] Cronqvist and Nilsson (2005) and Böhren *et al.* (1997) exclude financial corporations from the data set with the rationale that these firms' equity issuances are more predictable given the capital requirements concerning these firms.

[6] Outliers are extreme values, far away from- and not following the trend of the other observations in the data set (Sorokina *et al.,* 2013). The outliers may affect the regression coefficients and the statistical inferences, obtained from OLS-regressions, in such a way that interpretations may be skewed towards the outliers rather than the majority of the observations. As trimming may improve accuracy it may cause loss of important information simultaneously. An overview of trimmed variables can be found in Table 5.

[7] Trimming of variables was preferred compared to winsorizing, as winsorizing adds unambiguously incorrect observations to the dataset and is according to Sorokina *et al.* (2013) the inferior choice.

[8] The variables subject to trimming showed significant skewedness and kurtosis on a one percent level.

The market capitalization distribution confirms the size bias of our dataset, which to a large extent contains small cap firms relatively to mid- and large cap firms. Firms conducting standby rights offerings have a mean (median) market capitalization of SEK 899 (152) million, which is larger compared to firms conducting uninsured rights offerings with a mean (median) market capitalization of SEK 709 (71) million. Moreover, standby rights issuing firms conduct larger issuances, both in absolute size and relative to the firms' individual market capitalization. Table 4 provides the annual distribution of the equity issues as well as information regarding the amount issued.

Table 4: Annual distribution of rights offerings in the sample, 2007-2016

Year	Number of SEOs			Amount issued (SEKm)	Mean (SEKm)
	Total	Standby rights	Uninsured rights		
2007	28	4	24	1 894	68
2008	31	6	25	3 096	100
2009	57	11	46	10 437	183
2010	38	10	28	17 870	470
2011	40	12	28	4 625	116
2012	42	7	35	5 836	139
2013	47	6	41	2 717	58
2014	49	7	42	5 708	116
2015	77	2	75	4 209	55
2016	118	10	108	28 596	242
Total	**527**	**75**	**452**	**84 988**	**161**

This table shows the numbers of SEOs undertaken by the full sample and sorted by rights issue type. Moreover, the total and mean amount issued is listed for each year in SEKm.

The data shows that there is variation over time in the frequency of offerings. The number of rights offerings has increased since 2007, where 2016 represents the year where most rights offerings were conducted. The year 2009 can be considered deviant in terms of number of issuances (57), relative to the previous (31) and following year (38). This is plausibly due to the liquidity problems associated with the aftermath of the financial crisis, where debt financing might have been difficult to obtain, increasing the incentive for firms to issue new equity. Moreover, the year 2010 is deviant in mean amount issued per offering (SEK 470 million), further suggesting that this period, the aftermath of the financial crisis, is characterized by firms experiencing liquidity problems. In contrast to earlier papers (e.g., Eckbo and Masulis, 1992), we find that uninsured rights are the common choice among issuers. This might be due to increasing block-holder guarantee subscriptions, which is found to increase the probability of issuing uninsured rights (Hansen and Pinkerton, 1982).

4.2 Descriptive statistics of variables

Table 5 provides a description of the variables. More specifically, the event window cumulative abnormal returns as well as the variables used for the regression analysis are listed.

Table 5: Description of variables

Variable name	Description
CAR_A (-1;+1)*	Cumulative abnormal return for the window (-1;+1), with t = 0 being the time of the announcement of the SEO.
CAR_A (-2;+2)*	Cumulative abnormal return for the window (-2;+2), with t = 0 being the time of the announcement of the SEO.
CAR_A (-5;+5)*	Cumulative abnormal return for the window (-5;+5), with t = 0 being the time of the announcement of the SEO.
CAR_A (+2;+62)*	Cumulative abnormal return for the three-month window (+2;+62), with t = 0 being the time of the announcement of the SEO.
CAR_A (+2;+126)*	Cumulative abnormal return for the six-month window (+2;+126), with t = 0 being the time of the announcement of the SEO.
CAR_O (+2;+62)*	Cumulative abnormal return for the three-month window (+2;+62), with t = 0 being the time of the outcome of the SEO.
CAR_O (+2;+126)*	Cumulative abnormal return for the six-month window (+2;+126), with t = 0 being the time of the outcome of the SEO.
Relative size of issue	The quote value between the size of the offer and the market cap of the stock at the time of the announcement (%).
Subscription commitments	The subscription commitments scaled by offer size (%).
Discount*	The quote value between the offer price and the market price of the stock four days before the announcement date (%).
Shareholder takeup	The actual percentage of shareholders with preferential rights who did not trade away their subscription rights. Retrieved from the press release of the outcome (%).
B2M	The book-to-market ratio of each firm at the time of the SEO announcement.
Oversub (D)	A dummy variable that takes the value of one if the rights offering has been oversubscribed.
Small cap (D)	A dummy variable that takes the value of one if the firm conducting the SEO is a small cap firm.
Units (D)	A dummy variable that takes the value of one if the offering concerns units. A unit is a package deal of a number of stocks together with a number of stock options.

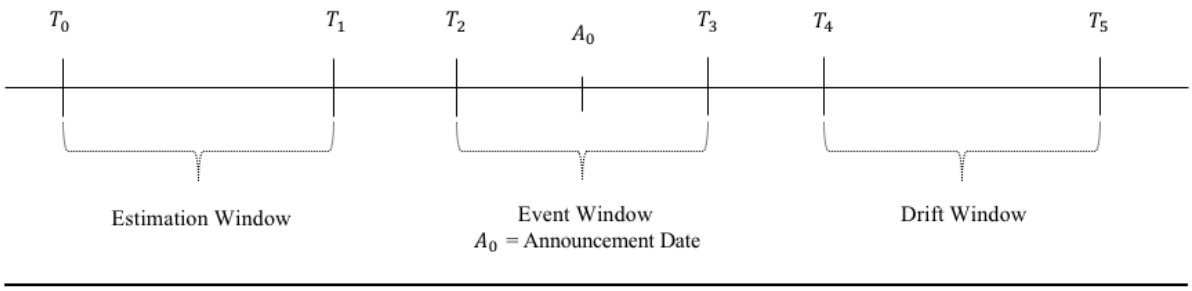
This table presents the variables used in the t-tests and regressions. Variables marked by a star (*) are variables where one percent of the most extreme values in the top and bottom of the distribution have been excluded. All days defined for the cumulative abnormal returns are defined as trading days.

5. Methodology

This chapter will present the methodology used, where section 5.1 defines the estimation period for the factor loadings of the market model, section 5.2 presents the different event windows employed for the analysis and section 5.3 discusses the test statistic used to address the statistical significance of the results. Lastly, section 5.4 contains the regression methodology used for the additional analysis.

The event study methodology, as proposed Fama *et al.* (1969), is commonly used to analyze the effect of a specific event on the stock price of a firm. The theory underlying the event study methodology is the efficient market hypothesis (EMH) (Fama *et al.*, 1969). EMH implies that a securities price reflects all available information surrounding a firm's current and future earnings and adapts as soon as new information becomes available in the market (Fama *et al.*, 1969). Thus, the same methodology can be used to assess market inefficiency (Damodaran, 2003). We will pursue an event study in order to examine if abnormal returns are present for firms conducting a rights offering. We start by dividing the timeline into three periods, as presented in Figure 1.

Figure 1: Event Study Timeline



5.1 Definition of the estimation window

When defining the estimation window there is a trade-off between statistical significance and bias from unrelated events (Aktas, de Bodt and Cousin, 2007). A longer estimation window provides a more reliable measure of expected return, although at the same time a longer period increases the likelihood of capturing noise from confounding events (Aktas, de Bodt and Cousin, 2007). We define the estimation period as A_0-300 to A_0-46 trading days, which is the time period $T_0 \rightarrow T_1$ in Figure 1, as used by DellaVigna and Pollet (2009).

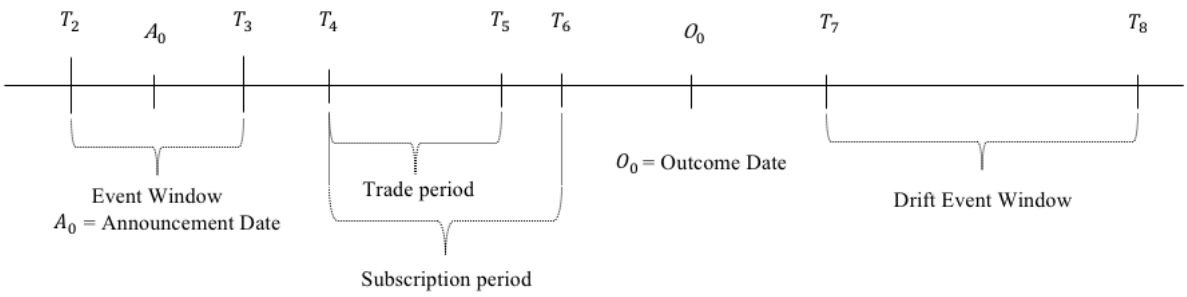
5.2 Definition of the event windows

The event window is defined as the period over which the stock price of the firms involved in the event of interest is examined. According to MacKinlay (1997), the event window should be larger than the event date as news of the event may have leaked out beforehand and insider trading might have occurred, which may, to some extent, be incorporated in the price before the exact event date. Moreover, as the news of the announcement may be released after the exchange has closed, we also consider the next day of trading. Thus, we define the event window for the immediate market reaction as CAR (A_0-1, A_0+1), where A_0 is the time of the SEO announcement. In Figure 1, this event window is presented as $T_2 \rightarrow T_3$. Moreover, inspired by Eckbo and Norli (2004), Dang Yang (2013) and Marinova *et al.* (2014), we will also investigate the event windows CAR (A_0-2, A_0+2) and CAR (A_0-5, A_0+5), to ensure that the market reaction obtained is robust for slightly longer event horizons.

The first two drift windows will be estimated from the announcement date, presented in Figure 1 as $T_4 \rightarrow T_5$. The drift windows considered will be the three-month CAR (A_0+2, A_0+62) and the six-month CAR (A_0+2, A_0+126), where A_0 is the time of the SEO announcement. The three-month window is motivated by closely related research on drift following announcements of dividend initiations and omissions (Michaely *et al.*, 1995), as well as findings by Bernard and Thomas (1989) showing that the drift phenomenon appears during the first 60 trading days following earnings announcement. The six-month drift window is included based on previous literature, where abnormal returns have been found during the first six months following announcements of firm commitments (Ritter, 2003).

Given that new information is released to the market during the trading period of subscription rights, we expect noise in the drift window following the announcement of the SEO. The drift event windows are of a pre-specified range, three and six months, but the time to complete each offering differs among firms, from three weeks to four months. Thus, the information contained in the drift event windows vary for each individual firm and are experienced over different horizons. To illustrate the issue-specific events following the announcement of the rights offering, we will divide the timeline into several periods, as presented in Figure 2.

Figure 2: Detailed Event Study Timeline



A few studies have recognized the importance of these information events following the announcement of rights offerings. Eckbo and Masulis (1992) and Dang and Yang (2013) examine abnormal returns not only for the rights offering announcement, but also for the subscription period of rights. Hansen (1988) extends this horizon by also including the post-subscription period. Common for these studies is that they find abnormal returns of different signs for the respective periods, suggesting noise would be present if one would estimate drift windows from the announcement date. Thus, similar to Burch *et al.* (2004), we will also estimate the drift after the completion of offering. However, unlike Burch *et al.* (2004), we have tailor-made the event windows to reflect each individual firm's outcome date instead of using a pre-specified range[9] for all companies. Outcome dates are hand-collected for each individual issue, in order to obtain more sophisticated estimates. From the outcome date, we will examine the drift windows three-month CAR (O_0+2, O_0+62) and six-month CAR (O_0+2, O_0+126), where O_0 is the outcome date. In Figure 2, these event windows are presented as $T_7 \rightarrow T_8$. It is plausible that these drift windows will capture the drift of the offering to a larger extent compared to the drift windows estimated from the announcement, as the estimates from the outcome date will not capture noise from the rights offering subscription period. Moreover, addressing drift by applying mid-term windows, instead of the criticized long-term windows (Fama, 1998), estimates will suffer less from disturbance from other events.

[9] Burch *et al.* (2004) estimation period for the post-issue abnormal returns begins two months after the offer month.

5.3 Computation of abnormal returns

In order to calculate the abnormal returns for our event windows we will apply, what MacKinlay (1997) refers to as, the market model, to estimate the expected return.[10] The market model is defined as

$$R_{it} = \alpha_i + \beta R_{mt} + \varepsilon_{it}$$

$$E(\varepsilon_{it}) = 0 \qquad var(\varepsilon_{it}) = \sigma^2_{\varepsilon_{it}}$$

Where R_{it} and R_{mt} are the period t stock return of firm i and the market portfolio[11] return respectively. ε_{it} is the disturbance term. The abnormal return will then be modelled as the difference between the actual return and expected return over the event window. The abnormal returns are then summarized to collect the cumulative abnormal return.

$$\widehat{AR_{\imath t}} = R_{it} - \hat{\alpha}_i - \hat{\beta}_i R_{mt}$$

$$\widehat{CAR_{\imath}}(t_1, t_2) = \sum_{t=t_1}^{t_2} \widehat{AR_{\imath t}}$$

In order to test if the cumulative abnormal return is strictly different from zero, we will apply a standard two-tailed t-test. The t-test may be used as our data fulfils the central limit theorem, suggesting that the distribution of our sample means is approximately normal.[12] The results of the t-tests will display the CAAR, which is the cumulative average abnormal return across all firms.

$$CAAR = \overline{CAR_{\imath}(t_1, t_2)} = \frac{1}{N} \sum_{t=t_1}^{t_2} \widehat{AR_{\imath t}}$$

Fama (1998) argues that anomalies following corporate events are fragile and tend to disappear when reasonable changes are made in how the anomalies are estimated. Given that many of the researchers presented in the literature review use the Buy-and-hold abnormal

[10] We also considered using an economic model to estimate the abnormal returns, namely the Capital asset pricing model (CAPM), but as the validity of the restrictions imposed by the CAPM on the market model are questionable, we disregarded it. See Fama and French (1996) and MacKinlay (1997) for further discussion.
[11] The market index used to calculate expected return is the OMXS index, which is an index consisting of all shares on the Stockholm Stock Exchange's main lists.
[12] The central limit theorem (CLT) argues that, given a sufficiently large sample, the sample mean will exhibit an approximate normal distribution pattern, no matter the distribution of the population the sample is drawn from. A thumb rule states that more than 30 elements are required in order for the CLT to hold (Aczel and Sounderpandian 2009), which our sample of 527 observations fulfills.

return (BHAR) model when estimating drift, we will employ the BHAR model to ensure that the drift estimates obtained from the CAR model are not sensitive to methodology. While the BHAR model is more interesting from an investor perspective, inferences are less reliable than those obtained by the CAR model (Fama, 1988). Barber and Lyon (1997) advocate that one should use the control firm approach instead of the benchmark approach[13] when employing the BHAR model in order to ensure well-specified test statistics. The control firm approach diminishes problems associated with BHAR models. The new listing bias is eliminated, as sample and control firms are listed in the event month. The rebalancing bias is reduced since there is no need to rebalance a portfolio when using a control firm. Lastly, the skewness bias diminishes since the sample and control firm are equally likely to experience positive returns of a larger magnitude.

For the sample of 527 rights offerings, we identify 430 control firms.[14] These firms are hand-collected and matched according to the method of Barber and Lyon (1997), where we first separate the peers with a market cap in the range of 70-130 percent of the market cap of the sample firm and then choose the peer closest in terms of the book-to-market ratio. Moreover, all peers should operate in the same sector and we choose a peer from the same industry if such a peer is available. Lastly, all control firms eligible are non-event firms, meaning that the control firms have not conducted an SEO in the 12 months before or after the offering of the sample firm. This ensures that we actually compare returns of an event and non-event firm. The BHAR model is specified as follows;

$$BHAR_{it} = \prod_{t=1}^{T}[1 + R_{it}] - \prod_{t=1}^{T}[1 + R_{mt}]$$

Where R_{it} is the monthly return of the event firm in month t, and R_{mt} is the monthly return of the control firm, matched by size and book-to-market ratio. As Barber and Lyon (1997) we

[13] The benchmark approach involves the use of a benchmark preferably matched by size and book-to-market including several non-event firms, which is then rebalanced every month (Barber and Lyon, 1997). Barber and Lyon (1997) argues that significant biases arise when this approach is used - the new listing bias, the rebalancing bias and skewness bias. We refer to Barber and Lyon (1997) for further discussion.

[14] The remaining 97 issues in the main analysis were eliminated from the BHAR analysis as we did not find a control firm due to limitations of the database. Relative valuation was not available for the given securities in Bloomberg.

will use a standard two-tailed t-test in order to test whether the abnormal returns are different from zero. The results will display the BHAR average abnormal return across all firms.

5.4 Cross-sectional analysis

Additional analysis will be provided in order to predict the determinants affecting the cumulative abnormal returns for the event windows. Such analysis may provide valuable theoretical insights with regards to the relationship between the cumulative abnormal return and various firm- and offering-specific characteristics. The OLS model is specified as follows

$$CAR_i(t_1, t_2) = \alpha_0 + \beta_1 X_{i1} + \cdots + \beta_j X_{ij} + \varepsilon_i$$

where the dependent variable, $CAR_i(t_1, t_2)$, is the cumulative abnormal return for firm i, from time t_1 to t_2. Regressions are run for several time windows, for both the immediate market reaction and post-announcement performance. We refer to the description of variables for a full list of cumulative abnormal event windows used. The regression model is extended with variables related to the offering and issuers, namely the book to market ratio, the size of offering, the discount of the offer, subscription commitments as well as the actual shareholder takeup. For the immediate market reaction, only the relative size of issue and discount is used as covariates, as the use of remaining covariates would not make sense, since this information is not accessible at this point in time. Table 6 provides information on the explanatory variables used in the regression model.[15]

Table 6: Descriptive statistics of the explanatory variables in the sample, 2007-2016

Variables	N	Mean	Median	STD	Min	Max
Relative size of issue (%)	527	48	30	62	1	700
Subscription commitments (%)*	526	24	22	23	0	100
Discount (%)	527	33	27	46	-161	100
Shareholder takeup (%)	420	79	87	22	5	100
B2M	524	0.65	0.29	1.20	-1.65	16.98

Variables marked by a star (*) are variables scaled by offer size in order to make comparisons across firms.

[15] The control variables present in some of the regressions are the dummies for; oversubscription, small cap and units rights offering.

A problem with OLS regressions is that it has been shown that linear estimates are biased and inconsistent when the timing of the issue is selected by the issuer (Eckbo *et al.*, 1990). However, Eckbo and Masulis (1992) state that inferences are unchanged when using OLS compared to non-linear estimates. In order to account for issues related to the assumptions of the classical linear model, we will use robust standard errors when running the regressions.[16] Robust standard errors solve less severe problems related to the violation of the assumptions of the regression model, such as non-normality and heteroscedasticity (Sorokina *et al.*, 2013).

6. Results and discussion

This chapter presents the results where we investigate the price reaction following 527 SEOs, for different time horizons, during a period between January 2007 and December 2016. The sections are divided such that 6.1 investigates the short-term market reaction, section 6.2 presents the results from mid-term windows and 6.3 discusses the underreaction hypothesis phenomenon. Lastly, section 6.4 provides additional analysis of the determinants affecting the cumulative abnormal returns.

6.1 Announcement abnormal returns

Table 7 presents the cumulative average abnormal return (CAAR) for different time periods around the announcement of the offering.

Table 7: Cumulative average abnormal return for 527 rights offerings, 2007-2016

Interval of trading days	Full sample	Standby rights	Uninsured rights
A-1 through A+1	-9.91***	-15.72***	-8.96***
A-2 through A+2	-10.74***	-16.97***	-9.74***
A-5 through A+5	-11.98***	-20.02***	-10.70***
No. of observations	527	75	452

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample and divided by rights offering type. A denotes the announcement date.

[16] We also considered using Huber-White standard errors, but as the robust standard errors provided more conservative estimates of the t-values, we favoured those. The more conservative t-values for the robust standard errors method is due to the degree of freedom correction, which the Huber-White standard errors do not consider. Clustered standard errors were also considered given that the SEOs are clustered for some years. Since Brav *et al.* (2000) show that clustering is problematic for long-term studies and since studies over mid-term horizons (eg., Hansen, 1988; Eckbo and Masulis, 1992; Böhren *et al*., 1997) do not use clustered standard errors, we do not apply it in this study.

The announcement cumulative average abnormal return for the full sample is significantly and economically negative, at the one percent level, which means that the first null hypothesis is rejected. For the full sample, the three-day cumulative average abnormal return is -9.91 percent. The results highlight that new important information is conveyed to the market, which suggest that some form of asymmetric information exist between the issuer and the market (Eckbo *et al*., 2007). Considering event windows of a slightly longer time span, we note that the market reaction is of the same sign and approximately the same magnitude. The cumulative average abnormal return for the five and 11-day horizon is -10.74 percent and -11.98 percent, respectively. The results differ from previous research conducted in small equity markets, where rights offerings experience positive announcement returns (Tan *et al.*, 2002; Ariff *et al.,* 2007). Our results indicate that rights offerings by Swedish firm are a negative signal of firm value, consistent with research on the French and U.K. market (Slovin *et al*., 2000; and Gajewski and Ginglinger, 2002). Thus, the problem of adverse selection might be present in our sample of issues, although it has been shown to be less severe for rights offerings than firm commitments (Levis, 1995).

The same trend is observed when we divide our sample by rights offering type, namely uninsured rights and standby rights. The abnormal returns for uninsured rights are negative in contrast to Eckbo and Norli's (2004) and Kang's (1990) findings of positive abnormal announcement return for uninsured rights. Moreover, the negative abnormal returns for standby rights also differ from previous papers (Eckbo and Norli, 2004; Cronqvist and Nilsson, 2005), which find no significant abnormal returns for this offer type. In our sample, standby rights exhibit a cumulative abnormal negative return of a larger magnitude than uninsured rights, -15.72 percent and -8.96 percent respectively, where the difference is significant at a one percent level.[17] This is consistent with the shareholder takeup model (Eckbo and Masulis, 1992; and Eckbo *et al*., 2007), where standby rights exhibit a more negative trend than uninsured rights.

[17] See Table A2 in the Appendix for table including a two-sample t-test for the difference in CAAR between the subcategories of offerings.

6.2 Drift window abnormal returns

The cumulative average abnormal return (CAAR) for the post-announcement and post-outcome drift period is presented in Table 8[18].

Table 8: Cumulative average abnormal return for 527 rights offerings, 2007-2016

Interval of trading days	Full sample	Standby rights	Uninsured rights
A+2 through A+62	-2.01	-10.17	-0.71
A+2 through A+126	-12.25***	-16.91	-11.64***
O+2 through O+62	-10.33***	-2.74	-11.80***
O+2 through O+126	-17.82***	-6.91	-19.74***
No. of observations	527	75	452

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample and divided by rights offering type. A denotes the announcement date and O denotes the outcome date.

The mid-term three-month drift window following the announcement does not show a CAAR significantly different from zero, which is in line with previous literature's mixed finding for mid-term windows following the announcement (Hansen, 1988). The three-month window following the announcement captures the subscription window and outcome announcement for the majority of the offerings. During this period, roughly the same information pieces are released for each SEO process, while for the event windows there might be a difference due to that some processes are conducted faster than others and some haven't been completed. The days between the announcement and outcome of the SEO in the sample are on average one and a half month but vary from three weeks to four months. Thus, the information contained in the issue-specific three-month drift window from announcement varies among offerings. The significantly negative abnormal return for the six-month window following the announcement, in conjunction with the window (A+2 through A+62), further indicates that the significance is related to significant drift following the outcome. This can be argued since

[18] Other windows that are not in the focus of this study are tested and show that the CAAR for the subscription period is significantly negative which is in line with the findings of Eckbo and Masulis (1992) on uninsured rights. However, the negative abnormal returns during the subscription period for standby rights differ from previous research (Eckbo and Masulis, 1992; and Hansen, 1988). Furthermore, in contrast to Hansen's (1988) findings, we find no significant abnormal returns for the 20-day post subscription period. Lastly, the short-term abnormal returns around the outcome announcement CAR (O_0-1, O_0+1) is significantly positive for the full sample and uninsured rights. However, when including the outcome publication in the drift windows CAR (O_0+2, O_0+62) and CAR (O_0+2, O_0+126), we see that the negative drift is stronger than the positive initial market reaction following the outcome announcement.

the (A+2 through A+126) window cover the outcome announcement drift for the majority of the offerings, as the average time it takes to complete an offering is one and a half month.

The cumulative average abnormal return, three and six months after the outcome announcement, is significantly and economically different from zero, which, together with the evidence from the six-month drift post the announcement, means that the second null hypothesis is rejected. The negative three-month CAAR of the full sample of -10.33 percent seem to be driven primarily by the uninsured rights, which has a CAAR of -11.80 percent for the same period. This is further underlined by the insignificant result from standby rights. Surprisingly, the difference cannot be confirmed by a simple t-test.[19] These results are also robust for the longer event horizon of six months, where the CAAR of the full sample and uninsured rights are -17.82 percent and -19.74 percent, respectively. When we cross-check the results from the CAR model with the BHAR model, we obtain similar results.

Table 9: Buy-and-hold average abnormal return for 430 rights offerings, 2007-2016

Interval of trading days	Full sample	Standby rights	Uninsured rights
A+2 through A+62	-3.25	-7.22	-2.63
A+2 through A+126	-6.76**	-14.23	-5.59
O+2 through O+62	-8.63***	-12.71**	-7.99***
O+2 through O+126	-10.26***	-16.57	-9.27***
No. of observations	430	58	372

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the buy-and-hold abnormal returns for the 430 sample offerings with compatible control firms. See section 5.3 for further clarification with regards to the control firm approach. Moreover, results are presented divided by rights offering type. A denotes the announcement date and O denotes the outcome date.

Table 9 concludes that the analysis presented from the CAR model does not alter when considering the BHAR model. The drift is significant for the same windows when considering the full sample and for the same drift windows estimated from the outcome date when considering the subcategory uninsured rights. Notably, the abnormal returns diminish in magnitude for the majority of the windows.[20] We believe this is attributed to the positive skewness that is more pronounced in BHAR models compared to CAR models as abnormal returns are compounded rather than summed over time (Barber and Lyon, 1997).

[19] See Table A2 in the Appendix for table including t-test for the difference in CAAR between the subcategories of offerings.
[20] The drift windows that diminish in magnitude are the A+2 through A+126, O+2 through O+62 and O+2 through O+126, both for the full sample and for the subcategory uninsured rights.

Interestingly, our results are not consistent with previous research on stock price performance following rights offerings in small markets. Compared to Eckbo and Norli (2004), we find negative abnormal returns for uninsured rights where they present insignificant abnormal returns. Moreover, Eckbo and Norli (2004) find negative long-term abnormal returns for standby rights, whereas we cannot reject the null of midterm abnormal returns different from zero for this rights category. Our results are also different from Burch *et al.* (2004) as we find significant negative abnormal returns for the full sample. The difference may be explained by the different event windows employed, as both studies use a long-term window of three years, which have been heavily criticized (Fama, 1998). Additionally, Eckbo and Norli (2004) do not address the problem of abnormal returns of different signs for the subscription period and outcome announcement. The results obtained from the CAR and the BHAR model are in line with research on rights offerings in larger markets such as France (Jeanneret, 2005), the U.K. (Andrikopoulos, 2009) and China (Dang and Yang, 2013).

6.3 Does the market underreact to SEO announcements?

The evidence from the post-outcome drift windows suggests that firms issuing equity underperform the first six months compared to if the firms had not issued. One reason for this underperformance could be that insiders take advantage of "windows of opportunity", by issuing stock that is overvalued (Clarke *et al.*, 2001). However, previous research shows that the incentive to time the issue decreases in the shareholder takeup (Eckbo *et al*., 2007)[21] and, compared to firm commitments, rights offerings are less likely to be market timed (Burch *et al.*, 2004). The more likely conclusion is that the market simply fails to impound the negative information of the offering at the time of the SEO announcement, leading to an inadequate reaction. The pattern of negative short-term reaction to the announcement of the SEO and the negative drift following the outcome announcement is consistent with the underreaction theory reported from studies on several corporate events, such as firm commitments SEOs (Ritter, 2003; Loughran and Ritter, 1995; and Burch *et al.*, 2004), stock splits (Ikenberry *et al.*, 1996), dividend initiations and omissions (Michaely *et al.*, 1995) and share repurchases (Ikenberry *et al.*, 1995). Thus, we reject the third null hypothesis. Since uninsured rights seem to drive the result for the whole sample, the conclusion should be that the initial announcement return and the drift of uninsured rights offerings support the underreaction hypothesis. These results are robust to a change of index, different estimation periods for the

[21] The full sample shows a mean (median) shareholder takeup of 79 (87) percent. See Table 6.

factor loadings of the market model, controlling for various discount levels[22] as well as controlling for non-normality using the Wilcoxon signed-rank test[23]. The data suggests that the market underreacts to the information content conveyed by the market at the announcement of uninsured rights offering, implying that behavioral biases of investors and managers affect prices. Thus, applying only a short-window event study around the announcement would provide a biased estimate of the effect on shareholder value from uninsured rights offering.

In order to address the economic significance of our results, we will divide the data set into size quartiles and by year. If the abnormal returns are concentrated in specific types of firms or only visible for certain years, the economic significance of the results can be questioned (Kang *et al.*, 1999). First, we will investigate whether the results are concentrated in specific types of firms. Brav *et al.* (2000) show that small firms experience larger negative abnormal returns relative to large firms and therefore argues that underperformance following SEOs in the U.S. is not a persistent phenomenon. When we compare issues by small cap firms to issues by non-small cap firms in the sample, we find no significant difference among the two groups for the drift windows.[24] However, the number of issues by non-small cap firms are relatively low in our sample, only 26 issues.[25] Thus, we construct size quartiles in order to further investigate whether smaller firms present in the sample drives the drift observed in the main analysis. Table 10 displays the difference in CAARs for the upper and lower quartile of issues in terms of market capitalization of the issuer.

[22] See Table A6, A7 and A8 in the Appendix for the results from a change in index, change of estimation period as well as the result from the CAAR when subject to trimming of the discount variable.
[23] In the same manner as Barber and Lyon (1997), we use the Wilcoxon signed rank test on data that has not been subject to trimming with respect to variables showing high levels of skewness and kurtosis the Wilcoxon signed rank tests are presented in the tables A10 and A11 in the Appendix.
[24] See Table A3 in the Appendix for table including t-test for the difference in CAAR between small cap and non-small cap issuers.
[25] Given the CLT thumb rule, the t-test may not be a reliable test statistic for the non-small cap issues, as the number of observations (26) is less than 30.

Table 10: Two sample t-test on several CARs for the upper and lower quartiles of issues in terms of issuer size

	CAR_A (-1;+1)	CAR_A (+2;+62)	CAR_A (+2;+126)	CAR_O (+2;+62)	CAR_O (+2;+126)
Difference	-5.56***	13.25	21.10	6.38	20.08

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from a two-sample t-test on CAR (A_0-1, A_0+1), CAR (A_0+2, A_0+62), CAR (A_0+2, A_0+126), CAR (O_0+2, O_0+62) and CAR (O_0+2, O_0+126) on the lower versus upper quartiles of issues in terms of size of the issuer, using Welch's (1947) formula and assuming that the two samples do not have equal variance. If the difference is negative, the CAAR for the smallest quartile is more negative than the CAAR for the largest quartile and vice versa. The sample size for both groups is 132 issues. A denotes the announcement date and O the outcome date.

Table 10 reveals that the only significant difference between the two groups is for the announcement abnormal returns, where the lower quartile in terms of size shows a larger negative reaction to the announcement of the SEO compared to the upper quartile of issuers. In contrast to Brav *et al.* (2000), we find no evidence post-announcement that small firms experience larger abnormal returns compared to larger firms. Thus, we can conclude that the abnormal returns for the full sample are not driven by small firms in the sample. Lastly, when we investigate the upper and lower quartile separately[26], we find that the smallest quartile does not exhibit any abnormal returns for the drift windows, suggesting that the underreaction hypothesis is not a valid explanation for the whole population of seasoned equity issuers.

What remains is to investigate whether the abnormal returns are concentrated in specific years. The data show variation over time in the frequency of rights offerings, visible in Table 4. Thus, as Kang *et al.* (1999), we will investigate the abnormal returns by dividing the sample by years in order to ensure that the results obtained for our main analysis are not driven by market conditions of specific years. Table 11 presents the result of the cumulative average abnormal returns divided by year.

[26] For full table of the upper and lower quartiles and the differences between them, see Table A4 in the Appendix.

Table 11: Year by year cumulative average abnormal return for 527 rights offerings

Year	CAR_A (-1;+1)	CAR_A (+2;+62)	CAR_A (+2;+126)	CAR_O (+2;+62)	CAR_O (+2;+126)
2007	-8.28**	-8.59	-24.78	-24.73**	-36.89***
2008	-13.05***	4.99	3.96	-17.47	-11.24
2009	-7.84***	6.80	1.18	5.37	12.53
2010	-10.55***	3.41	-11.12	-0.98	-20.68
2011	-14.52***	2.68	0.41	1.77	-3.63
2012	-9.39***	-1.59	-3.25	-4.85	4.50
2013	-11.89***	-6.92	-18.63	-23.35**	-32.22**
2014	-9.43***	-12.80	-26.97	-13.84	-24.54
2015	-6.87***	11.39	9.50	0.65	-3.87
2016	-10.28***	-12.32**	-33.41***	-22.23***	-42.10***

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample divided by year. The number of issuances by year are; 28 (2007), 31 (2008), 57 (2009), 38 (2010), 40 (2011), 42 (2012), 47 (2013), 49 (2014), 77 (2015) and 118 (2016). Results for the sample divided into two periods can be found in Appendix, in Table A5. A denotes the announcement date and O denotes the outcome date.

The above table shows that the finding of negative drift and the underreaction phenomenon are driven by issues conducted in 2007, 2013 and 2016. In fact, only the announcement cumulative average abnormal return is significant for each year, varying from -6.87 to -14.52 percent in magnitude. As the number of observations in each year varies and for some years are very small, we repeat the analysis by grouping the data in two periods, from 2007 to 2011 and from 2012 to 2016.[27] The results from the two periods highlight that the underreaction pattern is concentrated in the later part of the sample period, 2012-2016, which further support the results from the annual distribution of CAARs. The conclusion that the underreaction pattern is a relevant explanation for our data cannot be drawn when considering the annual distribution of CAARs. The negative drift following the announcement and outcome of rights offerings is not a persistent phenomenon in the sample.

[27] The results from the t-test for the two periods, 2007-2011 and 2012-2016, can be found in Table A5 in the Appendix.

6.3 Additional analysis

With inspiration from Ikenberry et al. (1995), to further clarify the nature of announcement returns and drift, we regress rights offering abnormal returns on various firm and issue characteristics.

Table 12: OLS regression on CAR for different event windows.

Variables	CAR_A (-1;+1)	CAR_A (+2;+62)	CAR_A (+2;+126)	CAR_O (+2;+62)	CAR_O (+2;+126)
Relative size of issue	-0.0396**	-0.0288	-0.0814	-0.107**	-0.0493
	(0.0159)	(0.0549)	(0.0826)	(0.0503)	(0.0654)
B2M	0.607	6.652**	12.87**	6.469**	5.492
	(1.186)	(3.026)	(5.554)	(3.070)	(5.496)
Small cap (D)	-8.186***	7.392	6.296	0.959	-0.854
	(2.032)	(4.320)	(7.118)	(5.237)	(8.382)
Discount	-0.0620***				
	(0.0153)				
Units (D)	-3.469				
	(2.044)				
Subscription commitments		0.0357	0.0619		
		(0.106)	(0.178)		
Shareholder takeup				0.285	0.419
				(0.176)	(0.319)
Oversub (D)				-11.14	-22.67
				(7.173)	(12.78)
Constant	1.817	-13.08**	-25.13***	-26.13	-36.69
	(2.088)	(5.086)	(8.391)	(15.76)	(26.77)
Observations	524	523	523	417	417
R-squared	0.076	0.020	0.024	0.035	0.017
F-test	7.58***	2.02	2.37	3.53*	1.72

*** and ** denote the significance at the 1% and 5% level respectively. Robust standard errors are presented in parentheses.

The table shows the results from ordinary least squares regressions on CAR over different event windows for the full sample. For the market reaction, subscription commitments are not considered as this is generally not known at the time of the announcement. For the drift from the outcome, shareholder takeup substitutes the variable subscription commitments, as shareholder takeup is known from this point on. Oversubscription is only included for the drift windows following the outcome, as it is not known at the start of estimation for the other windows. For further explanations regarding the dependent and explanatory variables we refer to Table 2. A correlation matrix of the variables used can be found in the Appendix, Table A1.

Table 12 depicts regressions of cumulative abnormal return on variables used by previous research and variables unique for this study. For the short-term market reaction around the announcement, the discount of the issue, the relative size of the issue and the small cap variable are significant at a minimum 5 percent level. Similarly, as Slovin *et al.* (2000), we find that the discount has a significant and negative effect on the cumulative abnormal return around the SEO announcement. For each percentage increase of the discount on the offer, the

cumulative abnormal return decreases by -0.06 percent for the short-term announcement window. The discount may dilute the current stock price of the firm (Eckbo *et al.*, 2007), which is predicted by the first regression. For the relative size of the issue, researchers have found that the size of the issue has a negative impact on the announcement returns (Asquith and Mullins, 1986; Masulis and Korwar, 1986; Choe *et al.*, 1993), which is in line with the signalling theory since the size of issue increase the probability of dilution of management ownership. This is consistent with our findings, where a larger size of the issue compared to the market capitalization of the firm has a negative impact on the cumulative abnormal returns around the announcement. For each percentage increase of the size of the issue relative to the firms' market cap, the cumulative abnormal return decreases by -0.04 percent for the short-term announcement window. As for the small cap variable, there is in general more information asymmetry related to small firms compared to large firms, which gives that there are higher costs associated with obtaining information about small stocks relative to large stocks. Therefore, large firms' stocks are likely more correctly valued and less likely to underperform relative to small stocks (Stoll and Whaley, 1983). Our findings are in line with this reasoning, where small cap firms experience more negative abnormal returns. The small cap effect on the cumulative abnormal return is -8.19 percent.

For the drift windows, the results indicate that other variables are relevant for explaining the abnormal returns, with the relative size of issue being the exception for the three-month drift window following the outcome date. Consistent with Loderer and Zimmerman (1988), we find that the negative relationship between abnormal returns and relative size of issue is also persistent for longer event horizons. The B2M-ratio have a significant and positive impact on abnormal returns for all drift windows except the six-month drift window post the outcome announcement, where the strongest effect is visible for the six-month drift window following the announcement. The B2M ratio reflects the relation between the firm's book value of equity and the market value of equity. Our positive coefficient for the B2M variable is in line with previous research, where studies have found that low B2M ratio gives lower returns (Daniel and Titman, 2006; and Fama and French, 1992). The explanatory power of the models are low, but previous research show this is common for cross-sectional analysis on cumulative abnormal returns, where the explanatory power is almost always less than 10 percent (Eckbo *et al*., 2007). However, the significant F-tests for the short-term market reaction and the drift windows of three-months following the outcome still indicate that the variables are jointly significant.

7. Conclusion

In this paper, we explore the announcement and post-issue stock price performance of rights issuing firms in Sweden. In contrast to Cronqvist and Nilsson (2005), the results show that firms conducting rights offers in Sweden exhibit negative abnormal returns at the time of the SEO announcement. These results suggest that rights offerings are a negative signal of firm value and they are consistent with studies on larger markets in Europe, such as France and the U.K. The results are significant for both standby rights and uninsured rights, where the evidence is strongest for standby rights in terms of magnitude. Moreover, the results from the CAR and BHAR model suggest that rights issuing firms underperform following the rights offer. The same conclusion does not hold for the subsample standby rights, which following the rights offering do not exhibit any significant abnormal returns, suggesting that the underperformance evidence is largely driven by the subsample uninsured rights. The pattern for uninsured rights, where we find abnormal returns of the same sign at both the announcement and post-issue period, is consistent with the underreaction hypothesis, where the market underreacts to the information regarding the rights offer at the announcement. Thus, the short-term event window at announcement is a biased estimate of the effect on shareholder value from an uninsured rights issuance. These results are robust to a change of index, different estimation periods for the factor loadings of the market model as well as controlling for various discount levels and different approaches of addressing non-normality of the data set..

Our sample mostly consists of small cap firms, hence, the results may not be applicable to the population of firms conducting rights offerings. However, we find no difference in post-announcement abnormal returns for small cap and non-small cap issuers. Thus, our evidence does not support Fama and French's (1992) general finding, where small firms generally exhibit lower returns. In fact, when dividing the sample into size quartiles, we find that the drift is concentrated to large firms, although the difference between the smallest and largest quartile in terms of market capitalization of the issuer is not significant. Moreover, the annual distribution of SEOs and the corresponding issuer stock price performance reveal that the underreaction pattern is driven by issues conducted in the years 2007, 2013 and 2016. Since the drift is limited to specific years and concentrated in firms of a specific size, it is not a persistent phenomenon in our sample. Thus, we cannot conclude that the evidence of abnormal returns in short- and midterm windows for the full sample provides systematic evidence in favor of behavioral models of market behavior. Our findings may just as well be a

manifestation of what Fama (1998) refers to as chance. Nevertheless, the disentanglement of rights offerings sheds a light on post-announcement performance models, which can be improved by adjusting the event windows past the issue outcome date in order to eliminate noise from issue-specific events.

7.1 Further research

Given the focus of this thesis, there are several starting points which future research can build upon. The behavioral field of research on stock price anomalies following seasoned equity offerings is vast, and we have omitted topics which may benefit from further investigation. Our main suggestion for future research relates to the outcome of rights offerings. Investigating the news announcement of the outcome, which conveys the failure or success of the offer, and the drift window past this announcement would be an interesting topic for EMH criticizers. Determined by the subscription rate, there are winners and losers, similar to positive and negative surprises in earnings announcements. Thus, economists could utilize behavioral theories when studying the relationship between the outcome announcement and drift. Lastly, even though our findings of underreaction are concentrated to certain years, the smallest measured magnitudes of the initial market reaction and the drift for rights offers is -9.9 and -10.3 percent, respectively. This is interesting from a trading perspective and motivates further investigation of whether the market behavior following SEOs can be exploited through a profitable trading strategy.

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Appendix – Supporting tables

Table A1: Pair-wise correlation matrix of the regression input variables

	Relative size of issue	B2M	Discount	Subscription commitments	Shareholder takeup	Oversub (D)	Small cap (D)	Units (D)
Relative size of issue	1							
B2M	0.3810***	1						
Discount	0.1912***	0.1238***	1					
Subscription commitments	0.0504	-0.0266	-0.0380	1				
Shareholder takeup	-0.2903***	-0.1526***	-0.0643	0.1897***	1			
Oversub (D)	-0.2715***	-0.2062***	-0.1357***	0.1379***	0.6443***	1		
Small cap (D)	0.0855**	-0.0025	-0.0046	-0.0584	-0.2335***	-0.1395***	1	
Units (D)	0.0583	-0.0347	0.0277	-0.0669	-0.1618***	-0.0290	0.0862**	1

*** and ** denote the significance at the 1% and 5% level respectively.

This table shows the correlation coefficients between the regression input variables. For further explanations regarding the variables we refer to Table 2.

Table A2: Cumulative average abnormal return for standby rights vs uninsured rights

Interval of trading days	Difference between Standby and Uninsured	Standby rights	Uninsured rights
A-1 through A+1	-6.76***	-15.72***	-8.96***
A+2 through A+62	-9.46	-10.17	-0.71
A+2 through A+126	-5.27	-16.91	-11.64***
O+2 through O+62	9.06	-2.74	-11.80***
O+2 through O+126	12.83	-6.91	-19.74***
No. of observations	527	75	452

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for standby rights and uninsured rights, as well as the results from a t-test on the difference between the categories using Welch's (1947) formula and assuming that the two samples do not have equal variance. A denotes the announcement date and O denotes the outcome date.

Table A3: Cumulative average abnormal return for small cap vs non-small cap issues

Interval of trading days	Difference between small cap and non-small cap issues	Small cap issues	Non-small cap issues
A-1 through A+1	-9.52***	-10.38***	-0.86
A+2 through A+62	6.64	-1.68	-8.32**
A+2 through A+126	4.76	-12.01***	-16.77***
O+2 through O+62	-3.87	-10.52***	-6.66
O+2 through O+126	-4.28	-18.03***	-13.75**
No. of observations	527	501	26

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for small cap and non-small cap issuers, as well as the results from a t-test on the difference between the categories of issuers using Welch's (1947) formula and assuming that the two samples do not have equal variance. A denotes the announcement date and O denotes the outcome date.

Table A4: Cumulative average abnormal return for the lower and upper quartiles

Interval of trading days	Difference between lower and upper quartile	Lower quartile MC < 30.52 SEKm	Upper quartile MC > 252.40 SEKm
A-1 through A+1	-5.56***	-13.33***	-7.77***
A+2 through A+62	13.25	5.57	-7.68**
A+2 through A+126	21.10	-1.35	-22.44***
O+2 through O+62	6.38	-6.92	-13.30***
O+2 through O+126	20.08	-4.23	-24.32***
No. of observations	264	132	132

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the smallest and largest quartiles determined by market capitalization, as well as the results from a t-test on the differences between the quartiles using Welch's (1947) formula and assuming that the two samples do not have equal variance. A denotes the announcement date and O denotes the outcome date.

Table A5: Cumulative average abnormal return for 527 rights offerings, by period

Year	CAR_A (-1;+1)	CAR_A (+2;+62)	CAR_A (+2;+126)	CAR_O (+2;+62)	CAR_O (+2;+126)
2007-2011	-10.64***	2.78	-4.69	-4.61	-8.24
2012-2016	-9.48***	-4.79	-16.65***	-13.67***	-23.40***

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample divided by year. The number of offerings in the period 2007-2011 and 2011-2016 are 194 and 333, respectively. A denotes the announcement date and O denotes the outcome date.

Table A6: Cumulative average abnormal return, change of index

Interval of trading days	Full sample	Standby rights	Uninsured rights
A-1 through A+1	-9.62***	-13.90***	-8.90***
A+2 through A+62	-0.51	-5.59	-0.31
A+2 through A+126	-9.81**	-13.98	-9.25
O+2 through O+62	-10.44***	-3.59	-11.80***
O+2 through O+126	-16.71***	-10.19	-17.89***
No. of observations	510	74	436

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample and divided by rights offer type. A denotes the announcement date and O denotes the outcome date. Index used for the market model is the Stockholm stock market small cap index. All cumulative abnormal variables have been trimmed at the one percent level, ensuring that high leverage data points do not affect the results. See section 4.1 for further clarification.

Table A7: Cumulative average abnormal return, change of estimation period

Interval of trading days	Full sample	Standby rights	Uninsured rights
A-1 through A+1	-9.27***	-14.03***	-8.47***
A+2 through A+62	3.66	-3.98	4.97
A+2 through A+126	-3.14	-7.69	-2.42
O+2 through O+62	-6.56***	-0.95	-7.67***
O+2 through O+126	-10.71***	-2.33	-12.14***
No. of observations	535	78	457

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal returns for the full sample and divided by rights offer type. The estimation period used for the factor loadings is A_0-220 to A_0-20, as suggested by MacKinlay (1997). All cumulative abnormal variables have been trimmed at the one percent level, ensuring that high leverage data points do not affect the results. See section 4.1 for further clarification. A denotes the announcement date and O denotes the outcome date.

Table A8: Adjusted CAAR with regards to trimming level of the discount variable

	Trimming level			
Interval of trading days	None	Weak	Medium	Strong
A-1 through A+1	-9.91***	-9.23***	-7.74***	-4.63***
A+2 through A+62	-2.01	-2.89	-2.09	-2.67
A+2 through A+126	-12.25***	-14.34***	-12.58**	-12.21
O+2 through O+62	-10.33***	-11.94***	-10.80***	-12.61***
O+2 through O+126	-17.82***	-21.12***	-19.49***	-20.66***
No. of observations	527	373	324	152

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the results from the t-tests for the cumulative average abnormal return with regards to different trimming levels of the discount variable. The weak trimming results in a dataset considering only observations with a discount below 60 percent and a premium lower than 60 percent. The cut-off percentages for the medium and strong trimming is 40 percent and 20 percent, respectively. The method described is inspired by the robustness test Eckbo and Norli (2004) apply in their study. All cumulative abnormal variables have been trimmed at the one percent level, ensuring that high leverage data points do not affect the results. See section 4.1 for further clarification. A denotes the announcement date and O denotes the outcome date.

Table A9: Distribution of diverse discount intervals

	[-100%; -75%]	[-75%; -25%]	[-25%; +25%]	[25%; 75%]	[75%; 100%]
Observations	14	19	189	129	110

This table shows the distribution of different discount levels. A negative discount is equivalent to a premium on the offer relatively to the market price. Given the distribution of diverse discount levels, we might still have some problems related to the discount variable affecting the abnormal returns in our results. A separate analysis of the results when we trim the discount variable is available in Table A8.

Table A10: Cumulative average abnormal return for 574 rights offerings, 2007-2016

Interval of trading days	Full sample	Standby rights	Uninsured rights
A-1 through A+1	-9.17$_a$	-13.28$_a$	-8.50$_a$
A-2 through A+2	-9.39$_a$	-13.41$_a$	-8.75$_a$
A-5 through A+5	-8.29$_a$	-13.96$_a$	-7.40$_a$
No. of observations	574	81	493

a and b denote the significance at the 1% and 5% level respectively for the Wilcoxon signed rank test.

The table shows the results from the Wilcoxon signed rank tests for the cumulative average abnormal returns for the full sample and divided by rights offering type. The sample is not subject to any trimming. A denotes the announcement date.

Table A11: Cumulative average abnormal return for 574 rights offerings, 2007-2016

Interval of trading days	Full sample	Standby rights	Uninsured rights
A+2 through A+62	3.26	-2.02	4.08
A+2 through A+126	-10.32	-9.04	-10.69
O+2 through O+62	-5.95$_a$	-2.34	-6.72$_a$
O+2 through O+126	-14.34$_a$	-9.04	-10.69$_a$
No. of observations	574	81	493

a and b denote the significance at the 1% and 5% level respectively for the Wilcoxon signed rank test.

The table shows the results from the Wilcoxon signed rank tests for the cumulative average abnormal returns for the full sample and divided by rights offering type. The sample is not subject to any trimming. A denotes the announcement date and O denotes the outcome date.

Table A12: Summary of mean values for the full sample, by year

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Market cap (SEKm)	301	1176	361	1253	334	370	208	954	329	1393
Firm seniority (years)	13.59	13.16	13.47	12.22	10.54	10.68	10.11	8.43	7.92	7.48
B2M	0.34	0.75	0.84	0.59	0.80	1.23	0.69	0.61	0.64	0.37
Offer size (SEKm)	67.65	99.86	183.10	470.26	115.63	138.94	57.82	116.48	54.67	242.34
Relative size of issue	42%	41%	46%	62%	60%	67%	48%	51%	49%	36%
Amount raised (SEKm)	69.57	96.19	182.61	468.96	114.59	137.39	58.23	116.30	54.44	243.01
Discount	42%	42%	43%	54%	53%	24%	25%	27%	23%	25%
Guarantee commitments (SEKm)	28.01	62.99	87.78	224.47	44.70	53.24	38.96	21.22	21.99	122.38
Guarantee commitments scaled by offer size	39%	36%	45%	45%	44%	42%	51%	40%	39%	41%
Subscription commitments (SEKm)	5.11	21.88	20.37	74.52	58.09	47.79	9.70	26.64	15.55	55.73
Subscription commitments scaled by offer size	15%	20%	21%	20%	27%	21%	22%	28%	28%	26%
Subscription rate	104%	93%	122%	117%	95%	118%	155%	135%	144%	148%
Shareholder takeup	79%	62%	84%	80%	69%	76%	79%	83%	75%	83%

The table shows the summary statistics for the mean values for the full sample divided by year, 2007-2016. The number of rights offerings in the full sample is 527, where 75 are standby rights offerings and 452 are uninsured rights offerings. The data is gathered from Bloomberg, Skatteverket as well as hand-collected from the press releases and prospectuses of each individual issuing firm.

Table A13: Comparison of mean values, standby rights vs uninsured rights

Variables	Mean of standby rights	Mean of uninsured rights	Mean of standby rights vs mean of uninsured rights
Market cap (SEKm)	899.18	708.58	-190.60
Firm seniority (years)	11.97	9.65	-2.32***
B2M	0.95	0.60	-0.35
Offer size (SEKm)	420.00	118.09	-301.91**
Relative size of issue	71.93%	44.44%	-27.49%**
Amount raised (SEKm)	419.96	117.82	-302.15**
Discount	57.79%	28.49%	-29.30%***
Guarantee commitments (SEKm)	289.63	38.92	-250.70**
Guarantee commitments scaled by offer size	61.28%	38.94%	-22.33%***
Subscription commitments (SEKm)	42.33	34.35	-7.98
Subscription commitments scaled by offer size	27.78%	23.39%	-4.40%
Subscription rate	117.56%	131.82%	14.26%
Shareholder takeup	78.30%	78.85%	0.56%

*** and ** denote the significance at the 1% and 5% level respectively.

The table shows the mean values of the two rights categories, standby rights and uninsured rights, as well as differences in mean values of the explanatory variables across the two rights offerings subcategories. Significance levels are obtained from two sample t-tests, using Welch's (1947) formula and assuming that the two samples do not have equal variance. A negative mean difference value indicates that the mean value of standby rights has a mean value of a larger positive magnitude than uninsured rights and vice versa. The data is gathered from Bloomberg, Skatteverket as well as hand-collected from the press releases and prospectuses of each individual issuing firm.