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# Underwritten Rights Issues

*- A Study of the Price of Using Underwriters on the Swedish Market*

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# Abstract

**Title:** Underwritten Rights Issues - A study of the price of using underwriters on the Swedish market.

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**Key words:** Rights Issues, Options Theory, Underwriting, Excess Return

**Purpose:** The purpose of this thesis is to see if companies pay too much to underwriters when making rights issues. The result is later compared with previous studies in the same subject to see if the Swedish market differ from other international markets.

**Methodology:** The method used is a quantitative approach with the use of Black and Scholes options theory.

**Theoretical framework:** The theoretical framework covers both financial theories like: market signaling theory and pecking order theory as well as a literature review of previous studies.

**Empirical foundation:** There is an initial sample of all firms who conducted a rights issue during the years 2008-2013 on the exchanges Nasdaq OMX Stockholm, NGM Equity and AktieTorget.

**Conclusions:** Overall, there is an excess return to underwriters on the Swedish market as in line with most of the previous studies conducted on other markets. There is a difference between the three different exchanges on the Swedish market where Nasdaq OMX Stockholm have the most excess return to underwriters, while NGM Equity do not have any excess return to underwriters. Further there is a significant difference between the compensations paid by companies when making a defensive or offensive rights issue where companies paying more when making a defensive rights issue.

## Table of Contents

1. Introduction.....	7
1.1 Background.....	8
1.1.1 Rights Issues .....	8
1.1.2 Subscription Commitment and Underwritten Agreement .....	8
1.2 Problem.....	10
1.3 Research Questions.....	12
1.4 Purpose.....	12
1.5 Delimitations.....	12
1.6 Study Outline .....	13
2. Theory.....	14
2.1 Efficient Market Hypothesis.....	14
2.1.1 Weak Market.....	14
2.1.2 Semi-Strong Market.....	14
2.1.3 Strong Market .....	15
2.1.4 The Swedish Market .....	15
2.2 Pecking Order Theory.....	16
2.3 Signaling Theory.....	17
2.4 Previous Empirical Research .....	18
2.4.1 Option Valuations for Rights Issue Compensations .....	18
2.4.2 Rights Issues and Signaling .....	21
3. Method.....	23
3.1 Research Approach and Data.....	23
3.1.1 Data.....	23
3.1.2 Data Division .....	25

3.2 Methods Used when Handling the Data .....	26
3.2.1 Value the Underwriting Agreement using Options Pricing Model .....	26
3.2.2 Black and Scholes Options Theory.....	27
3.2.3 Significance Test.....	29
3.3 Source Criticism.....	29
3.4 Reliability.....	30
3.5 Validity .....	30
4. Empirical Evidence.....	32
4.1 Option Valuation Results .....	32
4.1.2 Robustness Check .....	34
4.2 Result Divided by Exchange.....	35
4.2.1 Nasdaq OMX Stockholm.....	35
4.2.2 NGM Equity.....	36
4.2.3 AktieTorget .....	37
4.3 Results Divided by Offensive and Defensive Rights Issue .....	38
4.3.1 Offensive Rights Issue .....	38
4.3.2 Defensive Rights Issue.....	39
4.3.3 Difference Between Offensive and Defensive.....	39
5. Analysis.....	41
5.1 Valuation of Underwriting Agreements.....	41
5.2 Cluster Analysis .....	42
5.2.1 Exchange Cluster .....	42
5.2.2 Offensive and Defensive Cluster .....	46
6. Conclusion .....	48
6.1 Concluding Remarks.....	48

6.2 Future Research .....	49
7. Reference List .....	51
8. Appendix.....	55
8.1 Appendix 1.....	55
8.2 Appendix 2.....	56

**Dictionary:**

*Compensation fee:* The compensation the company pays to the underwriter, often a percentage of the guaranteed amount the underwriter take on. In the presence of compensation fee, the underwriter gets paid no matter if he needs to buy shares or not.

*Contract unit:* A contract in which the amount of the underlying asset is represented by an option contract.

*Excess return:* The extra money a company pays and the underwriter gets because the compensation exceeds the price it would had been in an efficient market.

*Guaranteed amount:* The amount an underwriter commits to subscribe for the shares that were offered but not subscribed by shareholders.

*Rights issue:* When a company issues new shares to the market to raise money.

*Sub-underwriter:* Acts as an insurer for the underwriter.

*Underwriter:* A person/company/bank that commits to buy shares that is not subscribed in a rights issue.

*Underwriter agreement:* The agreement between the company making a rights issue and an underwriter who guarantees that a certain percentage/amount gets subscribed.

# 1. Introduction

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*In the introductory chapter the reader gets introduced to a background in the subject and to the problem underlying the purpose of this study. The delimitations that are used for the data collection and the study are further presented as well as an outline for the complete study.*

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2013 was a record year in the amount of rights issues made on the Swedish market, with an increase of 50 percent compared to the same period in 2012 (Dn.se, 2014-01-09). As more companies are making rights issues there has also been an increasing use of underwriters. Underwritten rights issues are something that began to emerge in the late 1990's. However, something that caused the market to really open its eyes for underwriting agreements was in the summer of 2002 when Ericsson raised over SEK 30 Bn and paid total compensations of SEK 1.1 Bn, of which a large part was a cost for the owners and banks to underwrite the issue. (Va.se, 2009-03-26) When the financial crisis hit in 2008 companies use of underwriters became a common feature of almost all the rights issues on the Swedish market. Since then it has almost become a standard to secure that the rights issue becomes fully subscribed by using underwriters. At first there were only the major banks and institutions that secured rights issues for companies as underwriters. However, in the last couple of years there have been an increasing number of wealthy private investors who are now queuing to underwrite rights issues. As the use of underwriters has become a more or less matter of course for companies, private investors see the underwriting agreement as an increasingly profitable investment. Although private investors are getting more willing to underwrite rights issues, companies still tends to pay substantial amounts of compensation to the underwriters. (Affärsvärlden.se, 2012-06-19)

*- "The system of underwriting is often unnecessarily expensive for companies, as abuse occurs the need for it should always be questioned." Günther Mårder CEO Aktiespararna 2010.*

In light of this, the study aims to investigate if the compensations paid to the underwriters are correctly priced given the risk reduction it gives for the company and its shareholders. By doing

this, the authors hope that they can see if there is excess return pricing and if there is a difference between Sweden and other countries regarding this matter.

## 1.1 Background

### 1.1.1 Rights Issues

A rights issue is when a company is in need of funds and trying to raise money by offering new shares to the existing shareholders (Brealey et al, 2011). The most common way to issue new shares in Sweden is by preferential rights issues. This is due to the fact that the companies-act in Sweden states that, upon issuance of new shares, the existing shareholders have preferential rights to the new shares in proportion to the number of shares they already own. (ABL 2005:551 Ch. 13) Furthermore, a rights issue can be done either in a defensive or in an offensive way. A defensive rights issue is when the money from the issue mainly goes to paying back debt or keeping the company afloat, while an offensive rights issue is one that companies do when they need new money for investments or in order to be able to make the next stage in a development process (Privataaffärer.se, 2010).

### 1.1.2 Subscription Commitment and Underwritten Agreement

When a company makes a rights issue, they can make use of subscription commitments and underwritten agreements in order to make sure that the company raise all the money they need. A subscription commitment means that an existing shareholder signs a contract with the company to buy all or some of their subscription rights. If the company want to ensure that the rights issue get fully subscribed, they can do this by using underwritten agreements. However, unlike subscription commitments, underwritten agreements are something that the issuing company usually must pay for, i.e. the company needs to pay a compensation fee to the underwriter for the risk the underwriter is taking. (Ogden, Jen, O'Connor, 2003) Issuing new shares is often associated with high transaction costs. As the management of a company is expected to be economically rational, especially when doing a rights issue, they should be keen on minimizing the costs. The compensation to the underwriter should therefore be in reasonable size in relation



to the risk reduction it gives for the company and the risk the underwriter is taking. (Marsh, 1980)

### 1.1.3 What Does the Market Look like Today

In 2013, there were a record number of new rights issues made by Swedish companies. As rights issues are associated with risk for companies, this is a sign that risk appetite is back on the Swedish stock markets. An increased appetite for risk together with the strong performance in the Swedish stock markets have made it attractive for companies to issue new shares in order to raise funds (TT.se, 2014-01-09). According to Nyemissioner.se, there were as much as 82 rights issues made in the last quarter in 2013. At AktieTorget, where many small cap companies are listed, there was an increase in the shares issued by almost 20 percent<sup>1</sup> throughout 2013 compared to the year before (DN.se, 2014-01-09). The total numbers of rights issues have increased as well as the total amount that is raised since the economic crisis in 2008. Since 2008 it has almost become a standard to secure the rights issue by using underwriters. This remains until today even though the economic climate has stabilized. In almost all rights issues there is at least one underwriter, but often there are several people, institutions, banks etc. that share the underwriting obligation and by that diversifying the risk. (Nyemissioner.se)

In a historical perspective, the compensations to the underwriters still lie on the same levels. What has changed in recent years is that the companies are setting a significantly larger discount to the actual share price of the new issue. This has become a common practice on the Swedish market after the Swedish airline company SAS made a rights issue in 2010 where the subscription price was set at 67 cents, a fraction of the then actual market price of the share. The consequence of this is that the dilution of the stocks is getting greater for shareholders. For underwriters, this reduces the risk that they have to buy any of the stocks they had underwritten. In the worst case scenario, the companies are selling shares to the underwriters at a really discounted price and at the same time pay them a compensation for it. As a consequence of the increasingly favorable conditions, to take the role as an underwriter has now become very popular for both institutions and private investors (Affärsvärlden.se, 2012-06-19).

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<sup>1</sup> Measured by SEK

As the risk is getting smaller and the conditions are getting better for the underwriters, more private investors are now queuing to take the role as an underwriter. When more investors open their eyes for underwriting agreements and the market becomes more mature the price should tend to get more effectively priced (Fama, 1970).

## 1.2 Problem

There are many reasons for companies to make use of underwriters when making a rights issue. However, managers must be careful that the company does not pay too much or for something they do not need. What is questionable is the value an underwritten agreement really provides for the company. The value of the underwritten agreement is the safety to be sure to sell all or most parts of the newly issued shares as well as the risk transfer this entails (Handley, 1995). What are also important to incorporate in the value are the signals it sends to the shareholders. For example, there is evidence that underwritten agreements signals to the shareholders that the stock is not overvalued (Ursel N.D., 2006; Cooney et al, 2003). This is good in the sense that it reduces the speculation that the shares are overvalued, which is often considered as the reason for new rights issues in line with the pecking order theory (Armitage, 2002; Myers & Majluf, 1984).

Raising money from rights issues are not value creating in itself. If shareholders choose to subscribe for the rights issue, it is their own money that increases the company's cash balance and thereby creating no extra value for the shareholders. Extra shareholder value can only be created if the money is invested in value creating projects. (Brealey et al, 2011) In that sense, lower transaction cost when making a rights issue gives the company more money to invest in value creating projects. Intuitively it must lie in the interest of the management to minimize the cost associated with the rights issue. However, there is a conflict of interest regarding underwriting agreements as it is only the large shareholders, private investors and institutions who receive compensation from the company to underwrite issues (Handley, 1995). All but the smaller shareholders benefit from this system. If an issuing company are making a rights issue to reduce its debt, then the banks that have lent money to the issuing companies obviously are very keen that the issue are underwritten as it ensures that the companies are receiving the money to

reduce its debt burden. Managers are also ready to do a lot of sacrifices to ensure that a rights issue gets fully subscribed, like setting the subscription price at a high discount for instance, as a not fully subscribed rights issue is seen as a failure (Cooney et al, 2003; Kunimura & Iihara, 1985). This means that it is only the smaller shareholders who can criticize the choice of using underwriters and the compensations the company pays for it. In the end it is also the smaller shareholders who are paying the price for the unused and expensive underwriter agreements. (VA.se, 2009-03-26)

Previous studies on the compensations companies pay for underwritten agreements have been made in other international markets. There are evidence for overpriced underwritten agreements in many of these studies, for instance Marsh (1980) found that in both the US and the UK market the compensation was overpriced with as much as 98 percent of the compensation fee in the US market, as well as Handley (1995) who found the same general result in the Australian where the compensation was overpriced with approximately 49 percent of the compensation fee. Furthermore, there have also been studies on the Japanese market where Kunimura and Iihara (1985) find that there was a significant excess return in the market. In contrast Bae and Levy (1990) found that there was a competitive pricing in their sample of 679 rights issues on the US market. Handley (1995) as well as Cooney et al (2003) study what might drive this mispricing by using regression analysis for different variables, for instance variables like: debt-burden, subscription discount and volatility, where they find different significant variables in each of their studies. Although there are some studies conducted on different markets there are none for the Swedish market. This is possibly because the use of underwriting agreements is a relatively young and new phenomenon on the Swedish market (FI, 2007). As there are no previous studies conducted on the Swedish market there is a research gap that needs to be filled. The authors therefore see this as an interesting market to investigate. Further, the authors also want to see whether the underwriting agreements are more effectively priced now, due to maturity and market forces, than what can be seen in previous studies.

### 1.3 Research Questions

- 1. Are the compensations the companies pays to the underwriters fair in relation to the risk reduction it gives to the company and its shareholders on the Swedish market?*
- 2. Are underwriting agreements more effectively priced in Sweden than on other markets examined in previous research?*

### 1.4 Purpose

The purpose of the study is to see if Swedish companies, when making rights issues, are paying fair compensations to underwriters in relation to what they gain in risk protection. By doing this the authors are also going see whether the compensations are more effectively priced relative to what previous studies have shown in other markets. The goal of the study is to provide a basis for companies when deciding the compensation to the underwriters.

### 1.5 Delimitations

The authors limit the study by looking at companies listed on the Swedish market. This is interesting as there are differences in the laws regarding underwritten agreements for different countries. Sweden has a unique law, which is stated earlier, that states that the existing shareholders have priority when there are new shares issued (ABL 2005:551 Ch. 13). The use of underwriters is also a relatively new phenomenon on the Swedish market, which makes a study of this market needed. The authors choose to analyze companies that have undergone one or more rights issues with an underwriter during the period 2008-2013. Why this time-period is chosen is because of the fact that it represents one whole business-cycle (Businesscycle.com, 2013). There have been no previous studies conducted on the Swedish market before, why a more up to date data set is used. The data is collected from the stock exchanges Nasdaq OMX Stockholm, NGM Equity and AktieTorget. All the rights issues on these exchanges have been collected but later revised to arrive at the final sample. This makes the sample diverse and it is

going to be possible to see if there are any differences between firms on different exchanges. In order to be able to calculate an option price, the authors only make use of rights issues that are paid in cash. That means that certain rights issues that have options, units or other different attachments are not to be included. The authors also exclude IPO's, since historical share prices are needed for the calculations. Further, the authors use the theories discussed and take the variables that is used in the option valuation into consideration when analyzing the sample and do not look into further variables.

## **1.6 Study Outline**

In chapter two the relevant theories for the study and a literature review is presented. Chapter three explains and describes the choice of method and the framework used as well as discussions about the validity and reliability of the study, while chapter four presents the empirical evidence collected in a structured and intuitive way. In Chapter five, an analysis is made of the empirical data using the theories discussed earlier. The study ends in chapter six where the author's presents a discussion by answering the research questions and give suggestions for further research.

## 2. Theory

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*This chapter goes through the relevant theories that later are the basis for the study's analysis chapter. A literature review of earlier empirical research in the area of underwritten rights issues and adjacent subjects are also presented.*

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### 2.1 Efficient Market Hypothesis

The efficient market hypothesis, or EMH as first presented by Eugene Fama in 1970 and later revisited in 1991, is a measure that in its strongest version is said to reflect all available information on the market in the prices of securities. It is also said that EHM is needed in order to make resource allocation signals accurate (Fama, 1970). According to the literature, this is not the only market efficiency. The different market efficiencies are weak-, semi-strong- and strong-market efficiency and below there is a review of each one of them (Fama, 1991).

#### 2.1.1 Weak Market

The first market efficiency is the weak form which is characterized as a market where the only information that one can observe is the historical prices from different securities (Fama, 1991). When using this model you tend to get random walks (Ross, 1977). The random walk theory states that historical directions or movements of the price in a stock cannot be used to predict future movements (Fama, 1995).

#### 2.1.2 Semi-Strong Market

There is semi-strong efficiency in a market if it is reflected by the historical prices of securities, just as in the weak market, but also by all the available public information on the market (Fama, 1970). Information such as press releases or regular news could constitute as public information. However, there is no way to gain from this information as all available information already is

incorporated in the price of the securities. Thus there are no arbitrage opportunities in a semi-strong efficient market. (Fama, 1970)

### 2.1.3 Strong Market

Strong market efficiency is characterized by the fact that no information, even if it is insider information, can make any value change in a security since all information already is incorporated in the price of the security. There is no real market where this is actually true and thus insiders can still gain significantly from trading. (Fama, 1970)

### 2.1.4 The Swedish Market

There are not many earlier studies about which efficiency that are prevailing on the Swedish market except for Claesson (1987) who found that the Swedish market is a semi-strong market. However, there have been some recent studies where tests have been conducted to see whether the Swedish market follows a random walk or not. If there is random walk in a market, it is evidence that the market shows signs of weak form efficiency (Fama, 1970). These studies found no concluding evidence that the market follows a random walk, meaning that the semi-strong market that Claesson argued for in 1987 seems to still hold (Shaker, 2013). Therefore, this study sees the Swedish market as a semi-strong market. This means that all available information that is at hand is incorporated in the price of a security and thus the compensation that companies pays to the underwriter should be effectively priced, otherwise the market is not efficient according to the theory.

## 2.2 Pecking Order Theory

The pecking order theory is a theory about the optimal capital structure in a company and how that optimal structure should be accomplished and managed. The theory states that a company should, when it is possible, always raise money for an investment by using internally generated money first, i.e. use the current cash-flow surplus available as internally generated money is the cheapest form of financing. There should be a clear dividend policy and this policy should be sticky, which means that it should not be easily altered (Brealey et al, 2011). The second financing choice should be by issuing debt or some hybrid of debt. The last resort of financing, according to the pecking order theory, is equity by making a rights issue (Koller et al, 2010).

One of the reasons why this theory is so accepted and recognized is because of the signaling effect the choice of funding has for the investors. For example, equity is seen as a last resort as it sends a weak signal for the future of the company and an indication that the share price could be overvalued (Koller et al, 2010). Furthermore, as all the rights issues are made in either a defensive or an offensive way there should be a difference in the price if the pecking order theory were to hold. A defensive rights issue, i.e. a rights issue where the funds are used in order to pay back debt, should be more expensive for the company as it is associated with more risk and thus the compensation to underwriters should intuitively be higher.



## 2.3 Signaling Theory

The most forward way to think about the signaling theory is that there are two parties, one who is the sender and one who is the receiver of the message. The sender must make clear and know how to signal and communicate the information that the receiver gets. While the receiver, who get the information, must decide how the information is going to be interpreted. (Connelly et al, 2011) It is this theory that explains why companies, who use rights issues in order to raise capital, need to use underwriters. The use of underwriters assures the quality of the rights issue and becomes, according to Marsh (1980) as well as Slovin, Sushka and Lai (2000), a safety net for the investors.

The concept that is central for the signaling theory is the information asymmetry concept. This concept constitutes that there is asymmetry between the sender and receiver in the information they have, which is particularly important when the information is about the quality or the intent of a decision (Connelly et al, 2011). In a situation where the sender has more information than the receiver, there is a will for the sender to signal his intent and quality of the decision because of this information asymmetry. For instance when a company is deciding to make a rights issue, some receivers consider the share price as overvalued which make the share value drop (Brealey et al, 2011). This is the type of signaling effects that Armitage (2002) discusses in his study, in which he also see a positive signal effect when the rights issue has a large discount. What the signaling theory could be used for in this study is to further describe why there is a difference between an offensive and a defensive rights issue as an offensive rights issue should send a more positive signal to the market.

## 2.4 Previous Empirical Research

*Table 1 empirical research*

Author	Year	Period	Market	Method	Sample (n)	Estimated excess return (as % of compensation fee in brackets)
<b>Marsh</b>	1980	1962-1975	UK	Black and Scholes	174	1,21 % (63%)
<b>Marsh</b>	1980	1969-1973	USA (utility)	Black and Scholes	47	1,08 % (98,7 %)
<b>Kunimura and Iihara</b>	1985	1970-1980	Japan	Black and Scholes	148	1,89 % (76%)
<b>Bae and Levy</b>	1990	1982-1985	USA	Black and Scholes	679	0,13%(n.a)
<b>Breedon and Twinn</b>	1995	1986-1994	UK	Black and Scholes	31	1,14% (91%)
<b>Handley</b>	1995	1991-1993	Australia	Black and Scholes	60	0,6% (49 %)
<b>Cooney et al</b>	2003	1974-1991	Japan	Event study/Black and Scholes	555	Put-value for rights issues are positively correlated with announcement return
<b>Armitage</b>	2002	1985-1996	UK	Correlation to test the Eckbo-Masulis Theory	1378	No support for EM theory, meaning that the company does not benefit from underwriters as a certifier of value.

### 2.4.1 Option Valuations for Rights Issue Compensations

As Marsh (1980) was one of the first to use options theory in order to see if underwriting compensations are correctly priced, he paved the way for many of the studies that came after his. In his study he is using the Black and Scholes model in order to value underwriting agreements during the period 1962-1975 in the UK. He uses 174 companies in his sample as there was problem finding the volatility for all companies that issued new shares. The volatility that is being used by Marsh (1980) is the volatility of the stock four years prior the issue. The volatility measure is what stands out between Marsh's (1980) study and most of the studies that came after his, where the later studies have used much shorter volatility windows. For instance Handley (1995) used 180 trading days prior the rights issue, Bae and Levy (1990) as well as Cooney et al (2003) used 90 days prior the rights issue. Marsh's study concludes that the excess return was on average 63 percent of the compensation fee for the underwriting agreements in the UK for the underwriters and sub underwriters. He found this excess return by deducting the value from the

option valuation model from the actual underwriting compensation fee paid out. He further found that the variables that increased the excess return the most are when the agreements are short-lived and where there is a low volatility in the stock (Marsh, 1980). He also see that there might be some side payments and other factors, like administrative costs if an issue were to fail, that can affect the excess compensation which is in line with what Armitage (2002) discuss when he talks about sub-underwriters and the reputation underwriters must uphold. Marsh also investigates the US market, where there was an excess return to the underwriters of as much as 98,7 percent of the compensation fee. In the US data he uses only rights issues with regular underwriting agreements<sup>2</sup> and has only a relatively small sample of 47 rights issues, a sample size that can be questionable in relation to the size of this market. Further, the authors see the volatility of four years in Marsh (1980) study as a bit too long period since the companies investigated can change a lot during four years and thereby the volatility as well. Although the companies were not changing as much in 1980 as today this is probably the biggest drawback to raise in the study from Marsh (1980).

Kunimura and Iihara made a study in 1985 on the Japanese market where they found that on average the excess return was 1,89 percentage points or put differently 76 percent of the compensation fee. 1,89 percentage points is a number that is higher than both Marsh (1980) for the UK market and Handley (1995) for the Australian market. Their study has a sample size of 148 issues and they also make use of the Black and Scholes model as Marsh (1980), Handley (1995), Bae & Levy (1990) and Breedon & Twinn (1995). The variable used for the model that stands out is volatility where they have used the same as Marsh (1980), i.e. 4 years prior the issue. The same criticism can be applied here as the authors have for Marsh's choice of a volatility window of 4 years.

Breedon and Twinn conducted a study, similar to Marsh (1980), on the UK market in 1995. However, their sample was much smaller compared to the sample size in Marsh (1980) with only 31 rights issues. They did get almost the exact same excess return as Marsh (1980), but the question is if this result really can be generalized over the whole market with such few observations.

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<sup>2</sup> In the US study, Marsh ignored the rights issues that made use of sub-underwriters

Handley (1995) conducted a study on the Australian market where he also used the Black and Scholes formula to see the pricing and risk of underwriting agreements. The study is conducted on 60 rights issues with a time frame of 3 years. The main difference between Marsh (1980) and Handley (1995) is the volatility, where Handley used a much shorter volatility window. The main result from the study is in line with Marsh (1980) and Breedon & Twinn (1995), Handley find that on average 49 percent of the underwriting compensation is excess return or put another way the difference between the put-value and the underwriting compensation paid is 0.6 percentage points. The excess returns to the underwriters are shown to be unrelated to the size of the issue and the condition of the market at the time of the issue. However, there is a significantly higher excess return when looking at the issues where there is a low volatility and where there is a large discount, i.e. much lower subscription price than share price (Handley, 1995), this result is related to Armitage (2002) findings concerning discounts and announcement effects where a higher discount gives a negative announcement effect. Handley have a thorough approach to the options valuation although he have a short investigated period of years of which he does not state anything about the reasons for. The authors are also questioning the usage of the share-price chosen as there are no dilution effect calculated, an effect that is always present in all rights issues made and that should be taken into consideration to obtain a reliable result.

Bae and Levy (1990) was also using the Black and Scholes model to see whether the pricing of rights issues and the risk that is related to was effectively priced. They used 679 seasoned equity offers from listed firms in the US during the period 1982-1985. What they found was that the pricing was competitive with a significant excess return of 0.13 percent of the compensation to the underwriters. This low excess return is in contrast with both Handley (1995), Breedon and Twinn (1995) and Marsh (1980), although the studies might not be directly comparable due to differences in the markets laws and commitments it still gives a good valuation for the risk that is related to underwriting agreements. Although Bae and Levy (1990) do not motivate how they calculate excess return and what values they actually use in a proper way, they have without a doubt the biggest sample for calculating the excess return with the Black and Scholes model.

#### 2.4.2 Rights Issues and Signaling

The study made by Cooney et al (2003) is a study on the Japanese market. The time dimension plays a big role on the Japanese market as the subscription price is set several days before the subscription period starts, whereas in the US and most other markets it is set much closer to the announcement day with the use of the fixed-price offering method. Furthermore, the high discount used on the Japanese market, where subscription price is set well below the share price, distinguishes the Japanese market. The study makes use of an event study as well as the option valuation method as in many other studies that study underwritten agreements. Cooney et al (2003) concludes that the higher the offer price is, or the lower the discount is, the higher the put value is and hence the bigger risk there is for the underwriter. Because of this, the study concludes that the put-value is positively correlated with the announcement effect (Cooney et al, 2003). Further the study conclude that the fixed-price offering method is mostly used by companies who have a high volatility and therefore high uncertainty about the value in the preannouncement period, which is in line with what Handley (1995) suggests. Cooney et al (2003) see the value between the put-option and the real compensations paid as the risk the company have in the underwriting agreements where a higher put-value means lower risk for the company. Their result on the Japanese market is then set in comparison to the US market. However, as the US market might be completely different from the Japanese market, regarding rights issues and the laws surrounding them, another more comparable country might have been more applicable to use.

Armitages' (2002) study is related to the overall subject of rights issues and underwriters but it does not use any form of options theory as the previous studies have made. It does however shed some light on the signaling effects that underwriters might send. Armitage have based his study on the theory by Myers and Majluf (1984) that says that when a company makes a rights issue it is predicted that this have a negative effect on the share price as the investors see the share as overvalued. Armitages' (2002) has also based his study on the theory by Slovin, Sushka and Lai (2000) that says the major benefit of an underwriter is that it certifies the issuers quality and value of the share. He uses data from rights issues and open offers in the UK to test these two theories and see if they show any abnormal return around the announcements. Armitage finds

that underwritten open offers<sup>3</sup> have a positive abnormal return of 2.9 percent whereas underwritten rights issues have a negative abnormal return of 2.6 percent around announcement. The discount however is not a substitute for having an underwriter, it is rather a indication of how well the company is doing at the time of the rights issue. For example, a bigger discount shows indications that it is a company that need funding in order to survive, i.e. a defensive rights issue, which is in line with Myers and Majluf (1984). Armitage further concludes that the main purpose of underwriting in the UK is to guarantee the amount that is being underwritten rather than to certify that the issuer is not overvalued. The study does not really make clear how the sample is gathered or where it can be found. This is something that makes the validity of the study a bit weak. Furthermore, there is not a distinction between markets or if the companies are in the face of growth or if they are mature which can have a big influence when looking for signals.

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<sup>3</sup> Open offer means that the shares you purchase during the issuance cannot be sold to other parties.

## 3. Method

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*The chapter begins with how the authors choose and found the relevant data. This is later followed by the method used when handling the data. The chapter finishes with some source criticism and a discussion about the validity and reliability of the study.*

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### 3.1 Research Approach and Data

This study uses a deductive approach as explained by Bryman and Bell (2011). However, the authors do not use a deductive approach in its clearest form as the authors do not produce any hypothesis. The research questions asked are from previous research and the authors are therefore going to test if this holds for the Swedish market with the use of the Black and Scholes option theory. After looking at previous research, the authors understood that there is a research gap on the Swedish market and considerable savings for companies to be gained.

#### 3.1.1 Data

The data that is used in this study are surrounding the companies that have undergone one or more rights issues with an underwriter during the period 2008-2013<sup>4</sup>. Why this is an adequate time-period is because of the fact that it represents a whole business-cycle (Businesscycle.com, 2013). Further there are no studies on the Swedish market on this subject and therefore it is adequate to take the last known years in order to get the data up to date. The data is collected from the stock exchanges Nasdaq OMX Stockholm, NGM Equity and AktieTorget. These different exchanges were chosen due to the fact that they have different companies, regarding size and maturity, listed on them. Nasdaq OMX Stockholm and NGM Equity are two representative exchanges due to the fact that they are two of the biggest, regulated exchanges in Sweden (FI.se). As a complement to these regulated exchanges, the authors have chosen to include AktieTorget since there are many growth companies listed on this exchange. This gives

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<sup>4</sup> The complete set of companies can be found in appendix 1

the authors a more diverse sample and one more segment to investigate, which makes the validity of the study stronger (Bryman & Bell ,2011).

From the chosen exchanges there is a large amount of raw data to be found at the main sources Nyemissioner.se and FI.se. When searching through the companies, all in all 530<sup>5</sup>, the relevant prospects for the chosen companies are downloaded and further investigated. From the 530 companies, there are 86 potential companies that match the requested criteria's. The 444 companies that do not match the criteria's are either rights issues not paid in cash or they make use of contract units in the issue. Out of the 86 companies, the authors tried to find all the relevant variables through different sources and articles. Although the authors tried with different sources and data, one or more of the relevant variables that is needed for the calculations could not be found in 21 of the initial population. The number of companies actually used is therefore 65. This is an adequate sample size compared to the initial population, as the sample of 65 companies is well representative of the exchanges investigated. The sample is well diversified between the exchanges, where most of the data represent the two of the biggest exchanges, Nasdaq OMX Stockholm and AktieTorget, and smaller share of data represent NGM Equity. The sample size and representativeness is approximately the same as other studies on the same subject, although these studies have bigger economic markets (Handley, 1995; Marsh, 1980; Breedon & Twinn, 1995). The data that the authors are using from the prospects are: subscription price, issued amount, guaranteed amount, guarantee compensation, record date, underwriting date, dilution effect<sup>6</sup> and days of subscription period. The companies are divided by which stock exchange they were listed on when the rights issue was made<sup>7</sup>. The data is then sorted by year and if it is an offensive or defensive issue.

The share price for each company, which is set to the day before the underwritten agreement was signed, is collected from Thomson Reuters Eikon. Why the day before underwritten agreement is used is due to the fact that after the announcement of a rights issue the share price can either go up or down in line with the signaling theory depending on how the market reacts to the news.

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<sup>5</sup> Nasdaq OMX Stockholm 141 observations, AktieTorget 353 observations, NGM Equity 36 observations.

<sup>6</sup> Met by number of new shares divided by old ones.

<sup>7</sup> Some companies have changed exchange or gotten delisted.



Due to the fact that shareholders have the option to buy new shares at a lower price than the actual share price, rights issues have a dilution effect on the share price. In respect to the dilution effect, the authors choose to adjust the collected share price by the new number of shares to arrive at an adjusted share price after the offering<sup>8</sup>. This is in line with earlier research in this area (Marsh, 1980; Handley, 1995).

The implicit volatility could also be found on Thomson Reuters Eikon for almost all the companies. The time-period is set to 90 days before the record date and the number used is the average during this time-period. 90 days is used in order to avoid possible peaks that can skew the numbers when using a smaller time window. Around 90 days have been used in many of the earlier studies on this subject (Cooney et al, 2003; Breedon & Twinn, 1995) and in Bae and Levy (1990) exactly 90 days was used. For the companies that the authors could not find any volatility, the volatility is calculated by taking the annualized standard deviation from the share prices during a 90 day period prior the underwriting day. The authors are also collecting and calculating the 30 day volatility in order to make a robustness check and see how much affect the volatility have on the result. This is done in order to find if the variable, when altered, give a different result and to strengthen the structural validity (Lu & White, 2013).

The last variable, that is needed to be able to make use of the B&S option pricing model, is the risk-free rate. This is collected from Investing.com by using the average 3 month Swedish government bond during the different companies' subscription period (Investing.com, 2014). The risk-free rate needs to be an average due to the fact that the risk-free rate must be constant when applying the B&S option pricing model (Black & Scholes, 1972).

### 3.1.2 Data Division

The data used is divided into different clusters to see whether there are any differences between their specifications. The first cluster the authors look at is whether there were any differences in which exchange the company was listed on when making the rights issue. The authors divide

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<sup>8</sup> Adjusted share price after the offering =  $((\text{share price} \times \text{old shares}) + \text{size of the issue}) / (\text{old shares} + \text{new shares})$

them between Nasdaq OMX Stockholm, NGM Equity and AktieTorget. This is done in order to see if there might be any correlation between the compensations paid and what exchange the rights issue is made on. Further the previous studies like Marsh (1980), Handley (1995) and Breedon and Twinn (1995) have not divided their sample into different exchanges, why the authors think that this can add weight to the study. The data is also divided into defensive and offensive rights issues to see if there is a significant difference between these two types of issues. A division between defensive and offensive are further interesting because of the signaling effect a defensive rights issue can have.

## 3.2 Methods Used when Handling the Data

### 3.2.1 Value the Underwriting Agreement using Options Pricing Model

The value of using an underwriter for a company can be quantified by using an option valuation. By doing this, one can see how much a company should, in an efficient market, pay for the option of having an underwriter (Marsh, 1980). It is possible to use an option theory for this because of the nature of an underwriting agreement, where the company has the option to sell and the underwriter commits to buy the shares that are left unsubscribed. By doing this the company take away some of the risk in the issue. However, for this risk reduction the company needs to compensate the underwriter with a compensation between 2-10 percent of the guaranteed amount<sup>9</sup>(Affärsvärlden.se, 2012-06-19). In that sense underwritten agreement can be seen as a put option. The underwriter is selling the obligation to buy the remaining shares and the issuing company is buying the right to sell the remaining shares (Marsh, 1980).

Why this is useful is because the underwriting compensation fee that the company needs to pay, should, if there is an efficient market, be equal to the value of the calculated put-option. The options theory used is the classic Black and Scholes (B&S) options pricing theory. There are of course other options models to use, like the Binomial options pricing model first introduced in 1979 by Cox et al, but as these two models are very similar when it comes to valuing European

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<sup>9</sup> On the Swedish market

call and put options (Broadie & Detemple, 2004), the authors chose Black and Scholes option valuation as it is the most recognized and used model by other researchers in this field.

### 3.2.2 Black and Scholes Options Theory

When a rights issue is made with an underwriting agreement, the underwriter is bound to buy the stocks that are not sold. Due to the fact that the company buys this agreement and the underwriter has the obligation to deliver, one can therefore see this agreement as a put option (Marsh, 1980; Handley, 1995). The company buys the right to sell and the underwriter is bound to buy and for this the underwriter is paid a compensation. It is this compensation that is seen as the put option price in this study. In order for the agreement to be priced correctly, the actual paid compensation should be equal the put option value that is calculated by using B&S option pricing model (Marsh, 1980). The price of a call has the formula:

$$\text{Equation 1: } C = S \times N(d1)^{10} - K \times e^{-rt} \times N(d2)^{11}$$

Where the variables interpretation is:

Table 2 Black and Scholes variables

Original B&S variables	Variables interpreted for this study
C: Call price.	C: Call Price.
S: The current share price	S: Adjusted share price the day before the underwritten agreement was signed.
N(d1 & d2): Cumulative normal distribution functions	N(d1 & d2): Cumulative normal distribution functions
K: Exercise price	K: Subscription price
r: Risk-free rate	r: Average risk-free rate calculated by the 3 month Swedish government bond during the different companies' subscription period

The price of the call option can then be used to find the value of a put option, which is what the authors are looking for, by using the put-call parity. Put-call parity states that a European put option with a non-dividend paying stock should be equal to:

$$\text{Equation 2: } P = C - S + K \times e^{-rt}$$

<sup>10</sup>  $d1 = \frac{\ln[S/K] + (r + 0.5\sigma^2) \times T}{\sigma \sqrt{T}}$

<sup>11</sup>  $d2 = d1 - \sigma \sqrt{T}$

This means that you short the underlying stock and buy risk-free zero coupon bonds on top of the call-option price (Berk & DeMarzo, 2007; Marsh, 1980). Later, it is this put-option price that is compared to the real compensation paid by the companies. It is possible to use this formula since the rights issue can be seen as a non-dividend paying stock (Marsh, 1980). Furthermore, out of the five variables that are needed in order to use the B&S model, four variables are directly observable in the raw-data. This is good for the validity of the numbers that is derived for the model. The observable variables are the stock price  $S$ , the time to maturity  $T^{12}$ , the exercise price  $K$  and the risk-free rate  $r$ . The only variable that cannot be observed is the volatility  $\sigma$  for the shares. The procedure for finding and calculating the volatility can be found in the Data section.

When B&S derived their model they start from the premise that the current share price  $S$  follows a geometric Brownian motion and they make some assumptions about the market and stock price: (1) The capital markets are perfect, which means that there are no transaction costs or taxes and the information available is available for all participants. (2) The volatility of return of the stock is constant during the options duration. (3) Interest rate in the short term is fixed and the same for both borrowers and lenders. (4) Option holder is protected against distributions that affect the stock-price. (5) The returns on the stock are lognormal distributed. (6) The stock pays no dividends and (7) the option is European and can only be exercised at maturity. (Black & Scholes, 1972. Marsh, 1980)

When calculating rights issues and the underwriting compensations, all of these assumptions might not be entirely met. However, Marsh (1980) and Handley (1995) argues that they for the most part seem to be good approximations. The option in this study, i.e. the value of the underwriting agreement, can be seen as a European put option. This option has a short duration and therefore most surely have about the same risk-free rate during the option period. The start of the option is the day of the underwriting agreement and the end of the subscription period is the end of the option. There are no dividends paid during the options period, if there were dividends during the period these would be easily observable in the prospects of the rights issues

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<sup>12</sup> Time to maturity, i.e. the duration of the option, is the time from the signing of the underwriting agreement to the last day of the subscription period.

and thus possible to take into account (Marsh, 1980).

### 3.2.3 Significance Test

In order to be able to test if the results from the comparison between a defensive and an offensive rights issue and the differences between the calculated and real compensation fees are statistically significant there is a need for significance tests. In the literature there are many different test statistics that can be applied to studies, although the one most researchers in the area of underwriting valuation use is the t-statistics or student's t-test, see for example Cooney et al (2003) and Handley (1995). The t-test is used in order to see if two sets of data are significantly different from each other. If they are, there is significance to the difference and there are possibilities to draw conclusions out of the sample. Further in order to see if the prices between the real compensations paid and the option prices are significantly different a Wilcoxon Signed-Rank test is used, which is also conducted by Handley (1995).

### 3.3 Source Criticism

This study primarily uses secondary data as the majority of the data is collected from the prospectus for every rights issue. Despite this, they can be considered as reliable sources since the prospectus either have the Swedish Financial Supervisory Authority's (FI) or a certified accountant approval. When collecting data for share prices, the authors are using Thomson Reuters Eikon. For finding the risk-free rate, the authors are using Investing.com. Thomson Reuters Eikon is a reliable and well known source but one should always be careful when using internet-sources like Investing.com. However, Investing.com is a leading global financial portal site that have been around since 2007 and after going through the page and what has been written about it, the authors feel sure that it is a valid source that provides correct quotes and technical data. Furthermore, the books, papers or internet pages that are used for the theory are all reliable and well cited. The other internet sources that are being used, like for instance newspapers, can of course have an agenda or a twist on the information given. However, this is something that the

authors have in mind when they acquire the information. That is why the authors also try to have different sources for the same theories or information.

### **3.4 Reliability**

Reliability is said to be the extent to which the data collection techniques or analysis yield consistent findings independent of who performs it (Saunders et al, 2009; Bryman & Bell, 2011). From the method chapter above there is a clear and complete review of how the proceeding is being conducted. Furthermore, since the data used, except for the volatility, is directly observable the numbers should yield the same results. The volatility could give different values depending on how you calculate it but the difference should be small and negligible.

When there is calculations needed the authors make use of the special formulas that can be found in Excel or SPSS and checked if the other formulas used, like Black and Scholes, is consistent with the formulas in Marsh (1980) and the other literature used. For the search of data regarding share-prices and volatilities, the platform used is Thomson Reuters Eikon which is a platform that is not easily available but possible to get a license to. The raw-data that are used i.e. subscription price, guaranteed amount etc. is collected from the prospects that can be found at Nyemissioner.se by searching for the relevant company.

Furthermore there might be some possible errors in the study. This is due to the fact that all data that is collected from the prospects are manually processed, i.e. the numbers have been manually transferred from the prospects onto the excel sheet used. The data are checked several times, so possible errors should be negligible.

### **3.5 Validity**

According to Bryman and Bell (2011) there are several validity categories to take into consideration. The ones used in this chapter are: measurement validity, internal validity and external validity.

Measurement validity is about whether the study measures what it should measure (Bryman & Bell, 2011). Because of the fact that this study's purpose is to look at the compensation for rights issues, the most relevant issue is how to measure what the compensation should be. The study uses the Black and Scholes Option pricing model from Black and Scholes (1970) in order to do this. The model is further used in previous studies similar to this but on different markets (Marsh, 1980; Handley, 1995).

Internal validity discusses the causality in the relationship between two variables, i.e. does the x-variable (independent) and only the x-variable cause the effect on the y-variable (dependent) or are there any other variables that cause the effect (Bryman & Bell, 2011). Since this study sees the Swedish market as a semi-strong market, the security reflects all available public information and therefore the results are valid.

The external validity is about the representativeness of the sample and if there is a generalizable result from the sample (Bryman & Bell, 2011). This is discussed and examined earlier in this chapter, where the authors choose exchanges that is representable for the Swedish market, where there are both small and big companies in different stages and with different maturities.

## 4. Empirical Evidence

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*In this chapter the study's empirical evidence is presented. First the result for the whole sample is presented to see the more general numbers. The result is then divided and presented in smaller clusters to further enlighten the problem.*

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### 4.1 Option Valuation Results

In table 3 there is a table of the different options variables and their average value, in order for the reader to better understand what type of values that have been used in the calculations of the option.

*Table 3 the average for relevant variables used when valuing the put-option*

Variables for the option						
65 Rights issues						
	Subscription price SEK	Adjusted share price	Risk-free rate	Trading days	Volatility	
Average	5.00	8.38	1.03%	33.40	109.84%	
Median	1.60	8.38	0.95%	32.00	91.97%	

*Subscription price used is the price that can be seen in the different rights issues prospects. Trading days is the time from the day the underwriting agreement was signed until the last day of the subscription period. Volatility used is the 90 days average implied volatility for the different companies as the Black and Scholes model needs a constant volatility during the options duration. Risk-free rate, this variable is derived from the 3 month Swedish government bond during the different companies' subscription period. Adjusted share price is a theoretical share price that takes account of the dilution effect.*

After the valuation had been carried out and the put-option price had been calculated the result showed that the guarantee compensations between 2008-2013 on the Swedish market are, on average, not effectively priced. The results from the calculations can be seen in table 4 overall results.



Table 4 Overall results from the Black and Scholes valuation

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
Average	6.98%	5.69%	1.28%	18.34%
Median	7.01%	2.12%	2.90%	41.37%
*percentage of guaranteed amount **percentage of guarantee compensation				

When looking at the actual paid compensations in table 4 the underwriter get on average a compensation of 6.98 percent for his commitment to underwrite a rights issue. However, when calculating this compensation, as if it were effectively priced by using the option valuation, the underwriter should in fact get 5.69 percent on average. This means that on average an underwriter get 18.34<sup>13</sup> percent higher G compensation, compared to the guaranteed amount, than what he would get if the exchange were effectively priced.

The result varies over the sample where the biggest overpriced difference between the actual compensation and the calculated put-option price is as high as 17.92 percent. The biggest underpriced difference between the actual compensation and the calculated put-option price is 19.68 percent. There is a total of 21(n: 65) underpriced rights issues in the sample which is 32.31 percent, while the rest of the 44 issues were overpriced, i.e. 67.69 percent.<sup>14</sup>

When looking at this in real numbers the companies approximately paid SEK 5 Mn more in compensation on average than they would if the market were effectively priced. The rights issues guaranteed amount varied from SEK 1 Mn to SEK 17 634 Mn with an average guaranteed amount of SEK 572 Mn. There are a total of 33 offensive rights issues and 32 defensive rights issues.

As in line with Handley (1995), the difference between the put-value numbers and the real compensations paid is tested for significance with a Wilcoxon Signed-Rank. This test gave a p-value of 0.027, which can be seen in table 5, i.e. the sample is significant at the 5 percent level

<sup>13</sup> Calculated by taking 1.28/6.98.

<sup>14</sup> The 10 companies with the highest compensations and the highest difference between real compensation and put-values can be seen in appendix 2.

and the real compensation paid and the option price calculated is statistically different from each other.

*Table 5 Wilcoxon Signed-Rank test*

Test Statistics <sup>a</sup>	
	2 - 1
Z	-2.207 <sup>b</sup>
Asymp. Sig. (2-tailed)	.027
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

#### 4.1.2 Robustness Check

In line with Lu and Whites' article from 2013, a robustness check is conducted to see if the volatilities used were providing a robust result. This test is conducted using 30 day volatility and retrieved almost the exact same values<sup>15</sup> as the valuation with 90 days volatility. It is important to keep in mind that the average volatility for 30 days is higher due to the shorter time-span. Therefore, the answer is a bit higher with 30-day volatility but not enough to investigate this further or make any alterations to the data.

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<sup>15</sup> The difference between the two valuations' were on average a couple of percentage points higher return for the 30-day volatility when comparing the excess return as percentage of compensation fee.

## 4.2 Result Divided by Exchange

In order to be able to further analyze the result, the data is divided into different smaller clusters. The data is divided both by which exchange the companies were listed on and if the rights issue is offensive or defensive.

*Table 6 result divided by exchange clusters*

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
<b>Nasdaq OMX Stockholm</b>				
<b>Average</b>	5.35%	2.47%	2.88%	53.83%
<b>Median</b>	5.00%	0.86%	4.14%	82.80%
<b>NGM Equity</b>				
<b>Average</b>	7.41%	10.00%	-2.60%	-35.09%
<b>Median</b>	7.74%	2.62%	5.12%	66.15%
<b>AktieTorget</b>				
<b>Average</b>	9.14%	8.64%	0.50%	5.47%
<b>Median</b>	9.99%	7.70%	2.29%	22.92%
*percentage of guaranteed amount				
**percentage of guarantee compensation				

### 4.2.1 Nasdaq OMX Stockholm

*Table 7 Nasdaq OMX Stockholm*

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
<b>Nasdaq OMX Stockholm</b>				
<b>Average</b>	5.35%	2.47%	2.88%	53.83%
<b>Median</b>	5.00%	0.86%	4.14%	82.80%
*percentage of guaranteed amount				
**percentage of guarantee compensation				

For the companies that are listed on the Nasdaq OMX Stockholm during the period 2008-2013 there are on average an overvaluation of the compensations companies paid to underwriters. The average difference between the actual paid compensations and the put-option prices is 2.88

percent. This means that 53,83 percent of the compensations paid to the underwriters is overcompensation when comparing 2.88 percent to the real guarantee compensations (Table 7). There is an overcompensation in 27 of the 33 rights issues on Nasdaq OMX Stockholm, which means that 6 rights issues or 18 percent of the rights issues made are undervalued. The companies in Nasdaq OMX Stockholm also had an average discount of 53 percent. On Nasdaq OMX Stockholm the underwriters is characterized as big institutions and banks that often have a relation to the companies.

The average size of the rights issues made on Nasdaq OMX Stockholm is SEK 1892 Mn, with a minimum of SEK 22 Mn and a maximum of SEK 17 634 Mn. The average amount paid in compensation for the companies to the underwriters is SEK 48 Mn. If we look at the overcompensation in real numbers the companies paid on average SEK 26 Mn to much in compensation to the underwriters.

#### 4.2.2 NGM Equity

*Table 8 NGM Equity*

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
<b>NGM Equity</b>				
<b>Average</b>	7.41%	10.00%	-2.60%	-35.09%
<b>Median</b>	7.74%	2.62%	5.12%	66.15%
*percentage of guaranteed amount				
**percentage of guarantee compensation				

NGM Equity, which is the smallest sample of the three exchanges with only 9 companies that have done rights issues and matched the criteria's, have completely other values than both Nasdaq OMX Stockholm and AktieTorget. The exchange and the companies in this exchange are characterized by using underwriters who mainly are either banks or private investors and often there is more than one underwriter for each issue. NGM Equity have on average an undervaluation of the compensations paid by the companies of -2.60 percent (Table 8). This means that the companies paid -35.09 percent less to the underwriters, when comparing -2.60 to guarantee compensation (G), than what they should have done according to the option valuation

and if the exchange were effective. The amount of companies that had undervalued compensation is 4 out of 9. However these 4 rights issues had considerable undervaluation with an average discount between the share and subscription price of as much as 1648 percent. This result is much due to a very large discount in one of the issues and if you would take this extreme value away the average discount would be 312 percent.

The average size of the rights issues made on the NGM Equity stock exchange was SEK 52 Mn, with a minimum of SEK 7 Mn and a maximum value of SEK 226 Mn. With an average of SEK 2 Mn paid to underwriters from the companies. If we look at the compensation the companies paid to the underwriters in real numbers. We see that the companies paid SEK 0.73 Mn too little, on average, than what they would have if the price would have been effectively priced.

### 4.2.3 AktieTorget

*Table 9 AktieTorget*

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
<b>AktieTorget</b>				
<b>Average</b>	9.14%	8.64%	0.50%	5.47%
<b>Median</b>	9.99%	7.70%	2.29%	22.92%
*percentage of guaranteed amount				
**percentage of guarantee compensation				

At AktieTorget, which is the only unregulated of the exchanges in the sample, there are a lot of growth companies meaning that a lot of rights issues are made on this exchange. AktieTorget is like NGM Equity characterized by using underwriters who are either banks or private investors with often more than one underwriter for each issue. There is an overvaluation on this exchange just as on Nasdaq OMX Stockholm, but the difference between the actually paid compensation and the put-option price is not as high as on Nasdaq OMX Stockholm. On AktieTorget this difference is 0.5 percent, as can be seen in table 9. This means that 5.47 percent of the compensation that the companies paid to the underwriters is overcompensation. There is overcompensation in 12 of the 23 rights issues made by companies at AktieTorget i.e. approximately 50 percent of the companies paid too much for their underwriting agreement.

There is further a discount between the share price and the subscription price that is on average 222 percent.

The average size of the rights issues made at AktieTorget is SEK 17 Mn, where the smallest rights issue amount to SEK 2.5 Mn and the biggest SEK 65 Mn. The average amount the companies pay in compensation is SEK 1 Mn. When looking at the overcompensation in real numbers the companies at AktieTorget pays on average SEK 0.06 Mn too much in compensation to the underwriters than they would have if the price was effectively priced.

### 4.3 Results Divided by Offensive and Defensive Rights Issue

When comparing the offensive and defensive rights issues the authors conducted a t-test on the sample. The result from this t-statistics test for offensive and defensive rights issues are  $t = -56.713$ , meaning that the two variables are significantly different from each other. This means that it is possible to draw conclusions out of the sample.

*Table 10 over offensive and defensive rights issues*

	Guarantee compensation* (G)	Put-option price* (P)	Excess return (G-P)	Excess return as percentage of compensation fee**
<b>Offensive rights issue</b>				
<b>Average</b>	7.32%	6.37%	0.95%	14.44%
<b>Median</b>	7.01%	4.78%	1.91%	27.30%
<b>Defensive rights issue</b>				
<b>Average</b>	6.61%	4.98%	1.63%	24.65%
<b>Median</b>	7.33%	1.25%	3.19%	43.48%
*percentage of guaranteed amount				
**percentage of guarantee compensation				

#### 4.3.1 Offensive Rights Issue

What the results from the sample show is that offensive rights issues on average means that the company pays a compensation that is higher than if it were effectively priced by 0.95 percent. This means that 14.44 percent is overcompensation paid by the companies doing a rights issue on

offensive grounds (Table 10). As said before the number of offensive rights issues made is 33 (n: 65).

There is an average size of offensive rights issues made that amounts to SEK 141 Mn, with a minimum of SEK 2.5 Mn and a maximum size of SEK 1761 Mn. When companies did an offensive rights issue between 2008-2013 they paid on average SEK 4 Mn to the underwriters. Further the overcompensation in real numbers when companies did an offensive rights issue was SEK 0.64 MN.

#### 4.3.2 Defensive Rights Issue

When looking at the defensive rights issues made between the years 2008-2013 there is a difference between them and the offensive rights issues. On average the companies pays 1.63 percent to much in compensation to the underwriters compared to if it were effectively priced. Which means that 24.65 percent of the compensation that is paid out by companies doing an defensive rights issue to underwriters is overcompensation (table 10).

The average size of a defensive rights issue amounts to SEK 1833 Mn, with a minimum value of SEK 3.5 Mn and a maximum of SEK 27682 Mn. The companies making a defensive rights issue during this period pay on average a compensation of SEK 46 Mn to the underwriters. The overcompensation that the companies pays to underwriter's amount in real numbers to SEK 11.5 Mn.

#### 4.3.3 Difference Between Offensive and Defensive

When comparing the values of a defensive rights issue with the values of an offensive rights issue we can see that there is a difference between what the companies paid the underwriters in real numbers that amounts to almost SEK 11 Mn. Meaning that on average a defensive rights issue is more expensive than an offensive rights issue. This relation is true even when the

maximum and minimum numbers for the two are taken away although the amount then goes down to approximately SEK 3 Mn.



## 5. Analysis

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*In this chapter the empirical evidence are analyzed by applying the relevant theories to the sample used in this study. This discussion leads into the conclusions which are presented in chapter 6.*

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### 5.1 Valuation of Underwriting Agreements

The empirical findings in this study show that the rights issue market in Sweden are not effectively priced. From the result, there is a difference between the real compensation fee that the companies paid to the underwriters and the option-based compensation fee they should have paid if the market was effectively priced. This means that the majority of the companies in Sweden are paying too much when they make use of underwriters in their rights issues. This result is in line with the result in Marsh (1980) and Handley (1995) as well as other studies (Cooney et al, 2003; Breedon & Twinn, 1995), which all show evidence of an excess compensation paid by the companies to the underwriters. Marsh (1980) not only sees this as the markets inefficiency but also as a result of the presence of side payments and other factors that should be taken into consideration. What is important to emphasize though, is that the excess return in our study is smaller than what most of the previous studies have shown. This is something that might mean that the market for underwriters is getting more effective the more mature it gets. For instance when looking at the results from different studies compared to this study, it is possible to see that the compensations have gone down. Marsh (1980) found excess return of 63 percent (UK) and 98.7 percent (US) as a percentage of the compensation fee, while Handley (1995) found this number to be 49 percent (Australia) and in this study the same number is 18.34 percent. Although these studies are for different markets there seems to be a downward trend. Why there might be a more mature and stable market ahead with more effectively priced underwriting agreements for the companies.

The presence of excess returns on the market for underwriters is something that is important for companies to take into consideration when they set the compensation. When the underwriters

feel that they take more risk they most likely want a higher compensation, which makes it important for the companies to have some sort of valuation or benchmark for finding the correct compensation to pay in accordance with the actual risk. Furthermore, as the compensation often is a fixed fee it is mostly the terms of the issue and the subscription price that can be negotiated.

When making a robust test for volatility, the results appear to be robust. As the volatility is the only variable that cannot be directly observed in the data, it is important that there are no big differences when making the test. This is why a robustness check for a volatility of 30 days is made with the sample data. As this test yielded a result that differed by not more than a couple of percentage points<sup>16</sup> from the 90 days volatility there is no alterations made on the result.

## 5.2 Cluster Analysis

### 5.2.1 Exchange Cluster

When looking at the different exchanges it is interesting to see if companies listed on different exchanges pay different amount of compensation fees. As the exchanges differ in the type of companies listed on them, it is interesting to see whether this can be an influencing factor. Looking at the result in different exchanges is something that has not been done in other studies on the subject before. Therefore, the authors find it extra interesting to make this cluster division.

When looking at the cluster that is divided between exchanges there is a higher excess return in the sample for Nasdaq OMX Stockholm, an exchange where there are predominantly big companies that is mature or at least not at the beginning of their life, compared to the companies at NGM equity and AktieTorget which predominantly consists of smaller start-up companies that mainly needs the cash in order to grow. As there are many big companies on Nasdaq OMX Stockholm that variable might be a reason for the higher compensations compared to the compensations at NGM Equity and AktieTorget. This could mean that big companies, like those on Nasdaq OMX Stockholm, do larger rights issues which could be a reason for paying underwriters higher relative amounts of compensation fees. This argumentation is in line with

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<sup>16</sup> As calculated by percentage of excess return to compensations paid.

Marsh (1980), as discussed before, that says that there are other costs to take into account when analyzing rights issues. Marsh (1980) says that there are considerable administrative costs and side-payments that a company, if the rights issue were to fail, are bound to pay and need to pay again if the company would try to make yet another rights issue. To hedge the company from this risk it might be motivated for the company to pay the underwriters their required compensation, even when it is a bit too high, so they secure the rights issue rather than to expose themselves to the risk of making a rights issue again. Although this study show evidence of higher compensation in large rights issues, Handley (1995) argues that a large rights issue cannot explain why there is excess return. However, the data and sample in this study shows that there is more excess return to the underwriters on Nasdaq OMX Stockholm than on the other two exchanges where smaller companies with smaller rights issues are listed.

Nasdaq OMX Stockholm is the exchange that has the lowest discount between the share price and the subscription price. NGM Equity and AktieTorget both have discounts with triple digits in this percentage while Nasdaq OMX Stockholm has around a 53 percent discount. There is a difference between both NGM Equity, AktieTorget and Nasdaq OMX Stockholm in that the latter have the highest excess return to underwriters and the two others have either low excess return like AktieTorget or no excess return like NGM Equity. This shows of a relationship between excess return for underwriters and a small discount for companies, i.e. when companies have a smaller discount they tend to have higher compensations to underwriters. This is mainly due to the fact that the underwriter takes on more risk when there is a low discount in the rights issue. A low discount is often seen as there is a higher probability that the rights issue might not be fully subscribed and the underwriter would be forced to buy the shares that are not sold, in order to honor his agreement. This result is the same that Cooney et al (2003) found in their study i.e. that a lower discount means higher excess return for the compensation fee the companies pay to the underwriters.

The values from the sample for NGM Equity during the years 2008-2013 says that companies actually paid too little to the underwriters than what they should if the market were effectively priced. So it is possible to say that the companies on NGM Equity did not have as much risk as the companies listed on Nasdaq OMX Stockholm or AktieTorget. Why this might be the case

could be for several reasons. First, one reason can be that the discounts between the share price and the subscription price on this exchange tend to be very high. A high discount takes away much of the risk for the company that the issue might not get fully subscribed and this might be the reason why the underwriters gets paid less on this exchange. This is in line with Cooney et al (2003) and Handley (1995) who finds that a high discount means lower excess return for the underwriter due to the signaling effect. Cooney et al (2003) mean that because of the fact that when companies set the subscription price at a high discount, they believe that the rights issue has a bigger chance to get fully subscribed and therefore do not have any incentive to pay high compensations to the underwriters, this is something this study finds as well. Although this is good for the companies in the sense that they do not pay as much to the underwriters they can leave significant amount of money on the table, meaning that if they were to take a higher subscription price they would get in more money from the rights issue. Another explanation for this undervaluation can be that there is a large price uncertainty for the rights issues made on this exchange, which makes the underpricing higher, this argument have support from the study made by Bae and Levy (1990). However, the result for NGM Equity cannot be fully applicable as the sample size is fairly small with mere nine companies. Four of them are undervalued in the put-option price giving the average result in this specific exchange a bit skewed numbers.

AktieTorget is the exchange in Sweden that during the years 2008-2013 actually had the most effectively priced compensation fees with an excess return of 5.47 percent of the compensation fee. This is about the same values as in the study by Bae and Levy (1990) who also found competitively priced markets in their study. This is an interesting result as there are many smaller and younger companies on this exchange, then one might think that they do not have much to say in light of bargaining power about the compensation fees paid. Although they might be small there has been a tendency that these companies use more private investors when they use underwriters. This is something that might mean that bigger investors and institutions have more power to take higher compensations than smaller underwriters. However, this is not that strange as one big investor or institution have a higher risk than what many smaller investors have in a shared underwriting agreement and thus demand a higher risk premia, as that investor has no risk diversification.

Furthermore it seems like the results in our sample is much in line with the overall result for Marsh (1980). The authors as well as Marsh found that although bigger companies might have more bargaining power and more financially refined solutions there seems to be an opposite result. The results show that the smaller companies, the ones on NGM Equity and AktieTorget, have more competitive priced underwriting agreements than the bigger companies at Nasdaq OMX Stockholm. This means that there is more than just the size of a company or the size of the rights issue that decides the compensation fee.

#### 5.2.1.1 Signaling and Pecking Order Analysis

The signaling theory can be applied to the data in this study as there is more excess return in the sample for Nasdaq OMX Stockholm where bigger companies mainly are listed. Armitage (2002) looked at the UK market for signaling when using underwriters, where he found no evidence that underwriters are used for signaling a positive outcome to the market. The underwriting agreement is rather used as a mean to get all the shares subscribed. Cooney et al (2003) find that there is a positive return surrounding the announcement of a rights issue and on the put-values for the rights issues. One of the reasons that Nasdaq OMX Stockholm use underwriters can be that they need to certify that the rights issue is fully subscribed, due to the reasons for making a rights issue often is that the money cannot be raised internally or funded by debt. Since the companies on Nasdaq OMX Stockholm, that makes a rights issue, are mainly mature and they cannot raise capital internally or by debt this can be met with skepticism from investors. So by using underwriters to certify and signal to investors the rights issue's strength they can get away from the negative announcement effect discussed by Armitage (2002). Although they can somewhat eliminate this negative effect the companies on Nasdaq OMX Stockholm also use reputable firms to a large extent when making a rights issue. When companies use reputable firms and banks this has shown to further increase the excess return and can be a reason why companies on Nasdaq OMX Stockholm pay higher compensations to underwriters. This result is in line with Handley (1995) who also found this relationship in his study.

This is something that does not seem to be a problem in the other exchanges NGM Equity and AktieTorget as the latter hardly have any excess return and NGM Equity does not have any

excess return at all. This is strange as they have high discounts in both of these exchanges and a high discount signals that the share is overvalued (Armitage, 2002). This is probably mainly though because the announcement effect or signaling effect surrounding the announcement is not incorporated in the valuation, in order to not contaminate the result. Further these exchanges have much smaller companies that do not get as affected by the effects the signaling theory usually have as compared to the companies listed on Nasdaq OMX Stockholm.

### 5.2.2 Offensive and Defensive Cluster

When the sample is divided and tested for significance between offensive and defensive rights issues there is a statistically significant difference between the two. The result shows that the defensive rights issues have higher compensation fees to the underwriters than the offensive rights issues. This means that when a company makes a rights issue that is driven by the inability to pay back debt or solve other financial troubles that a company can have, they tend to have higher compensation fees to their underwriters, in comparison to companies that makes an offensive rights issue. This extra risk-premia that companies who are in a defensive position pay for their underwriters service is a premia that most certainly stems from the extra risk the underwriter see in the rights issue, for example bigger risk that the rights issue are not be fully subscribed. This result is most likely due to the fact that when the underwriter sees that there is more risk he, with most certainty, demands a higher compensation, while at the same time a company making a defensive rights issue are in a bad negotiating position as they often are in serious need for money.

The difference between compensation fees in a defensive and offensive rights issue can further be seen as a signaling effect. A company that makes a defensive rights issue need an underwriter who have a good reputation and are willing to take on the agreement. The company may then have to pay a little extra in order to get the positive signal the best choice of underwriter sends to the shareholders. Although Handley (1995) could not conclude that the reputation of the underwriter has an effect on the excess compensation in an agreement, it might have an effect on the share-price and also the underwriters own reputation (Armitage, 2002). Since the underwriters own reputation can be at stake the excess compensation fee can be a result of other

costs as well. For instance in some rights issues sub-underwriters is used and the extra cost associated with this insurance is put on the issuing company as Marsh (1980) and Armitage (2002) suggests.

Further in a defensive rights issue the rational investor would, if they think the money is going to be used to pay back debt, not subscribe to the shares as it is not going to make their wealth increase. This mean that if investors are rational they do not subscribe for their part of the shares if the money are going to be used for paying back debt as this is not going to increase their wealth (Brealey et al, 2011). So when the companies' shareholders are not willing to subscribe and as the market see a rights issue as a weak signal according to the signaling theory there are no other way to get the rights issue fully subscribed than by using an underwriter (Connelly et al, 2011). Today the easiest way to get around this problem might be to pay the underwriter a higher compensation. However, it is these companies, which are in financial distress, that suffer the most from paying too much in compensation.

## 6. Conclusion

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*In this chapter the authors draw conclusions from the previous chapter as well as describe what the study's result is and what it means. The chapter also shares some thoughts about further research that can be conducted in the area.*

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### 6.1 Concluding Remarks

On average, the companies making rights issues on the Swedish market pay underwriters a compensation fee of 6.98 percent of the guaranteed amount. This correspond to an overcharge of 18.34 percent of the compensation fee as the option valuation and price the company should pay if the market was effectively priced is 5.69 percent. At a cluster level, efficient pricing could be found on the exchange AktieTorget but not at Nasdaq OMX Stockholm or the smaller exchange NGM equity, where Nasdaq OMX Stockholm showed result of overpricing and NGM Equity underpricing. The overall results indicate that it is profitable to take the role as an underwriter for rights issues on the Swedish market. However, it is important to highlight that about 32 percent of the surveyed underwriting agreements are underpriced which means that the underwriters were not paid for the risk they were exposed to and the issuing company obtained a risk reduction greater than what they paid for. The study shows that to obtain efficient pricing, based on an option pricing perspective, there is a need to take the rights issue discount into consideration when deciding the right compensation. It is also important to incorporate the signaling effect the discount has on the rights issue. Further the authors emphasize the difficulty to estimate an accurate volatility, which underscores that the correct compensation should be seen as an interval. There is further a difference in the compensation fees whether it is an offensive or a defensive rights issue. On average, it is more expensive to make use of an underwriter in a defensive rights issue than in an offensive rights issue. The compensation paid in defensive rights issues show also a higher excess return for the underwriter; this result is furthermore statistically significant.



The results of this study show that the underwriters, on average, have received overpriced compensations to take the role as the underwriter. This result is consistent with what previous studies have found in their result on the UK-, Australian- and Japanese-market. For the US market, there have been diverging results in previous studies as the empirical evidence is available for both efficient and inefficient pricing.

From 2008 to 2013, private investors, institutions and banks have been compensated in excess to take the role as underwriters. As the authors mentioned in the analysis, this may be because it is a relatively new phenomenon in the Swedish market and because of the fact that the market has not become mature enough to adapt to efficient prices. This is something companies need to pay attention to as these extra costs, in almost each rights issue, affect the small shareholders in the company. When the big banks and wealthy investors have almost a monopoly in the underwriting market, they are those who also are the ones who set the prices. It is now up to the company's management and board to be aware of this and think more about if a guarantee truly provides the risk reduction and benefits the companies are looking for. The cost of underwriting agreements is therefore something that needs to be emphasized and something that the authors think should be a decision that should be taken together with the shareholders.

## 6.2 Future Research

After reviewing the relevant literature and conducting this study the authors see that there are more to be done in this subject. For instance, the authors chose to focus on the Swedish market as there were no such previous studies conducted. The aim was to look at the years between 2008-2013 and see if the compensation was as high in Sweden as in other international markets. What could be interesting is also to see if these results would differ with another time horizon on the Swedish market. This would further enlighten this markets' evolution and there can be possibilities to see how the compensation fees have changed with time on the Swedish market. Although the data can be hard to find historical volatilities and share prices, it could say something about the maturity of the market in Sweden.

It could also be interesting to test what variables that are affecting the excess return further than the option variables used, i.e. look at what other factors might drive the compensation to the underwriters beyond the option variables. As there is a significant difference between offensive and defensive rights issues, there might for instance be a correlation between the debt in a company and the compensation this company pays to the underwriter. In a similar matter it might be interesting to see if the size of a company and the compensation paid to underwriters has some explanatory value. By doing this there can be further discussion concerning these issues and what companies should think about when paying an underwriters' compensation. Another interesting variable to look at is the number of underwriters a company uses. This combined with for instance the relationship between the company and underwriter as Handley (1995) looked at, can be a good measure for further understanding of underwriting agreements and the compensations related to them.

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## 8. Appendix

### 8.1 Appendix 1

*Companies used in the study and the year they made a rights issue*

Year	Company
2008	Fingerprint cards AB
2008	IBS AB
2009	Eniro
2009	Fingerprint cards AB
2009	SEB
2009	Husqvarna
2009	Nordea AB
2009	Swedbank AB
2009	Tradedoubler
2009	Guideline Oil Drilling
2009	Guideline Technology AB
2009	Paynova
2009	Accelerator
2009	Miris
2010	Karo Bio AB
2010	Oasmia Pharma AB
2010	PA Resources AB
2010	Rörvik Timber AB
2010	SAS AB
2010	Central Asia Gold (Auriant Mining AB)
2010	Commodity Quest AB
2010	Accelerator
2010	Scirocco
2010	Vitanova (A+ sceince)
2011	Digital vision (image system)
2011	Kappahl AB
2011	Orexo AB
2011	Precise biometrics AB
2011	Swedish orphan biovitrum AB
2011	Transcom AB
2011	Confidence International AB
2011	LifeAssays AB
2011	Panaxia
2011	24H Technologies AB (Mavshack AB)

2011	Commodity Quest
2011	Deflamo
2011	HQ AB
2011	Medicpen AB
2011	A+
2011	Star Vault AB
2011	Värmlands Finans
2012	Karo Bio AB
2012	Nordic Mines AB
2012	Oasmia Pharma AB
2012	Precise biometrics AB
2012	Botnia
2012	NeuroVive
2012	Polyplank
2012	Ironroad
2013	Anoto Group AB
2013	Bioinvent AB
2013	Bong
2013	CDON Group AB
2013	Image Systems AB
2013	Nordic Mines AB
2013	Opus Group AB
2013	Precise biometrics AB
2013	Retail and Brands AB
2013	Glycorex
2013	Botnia Exploration AB
2013	Cefour Wine and Beverage AB
2013	Cortus Energy
2013	Guldadam Holding AB
2013	Hexatronic Scandinavia AB
2013	Miris Holding AB

## 8.2 Appendix 2

*A list over which companies had the ten highest compensations to their underwriters.*

Year	Company	Size of the issue Mn SEK	Underwriters compensation Mn SEK
2009	Nordea AB	27682	860
2009	SEB	15070	223
2009	Eniro	2517	76
2010	SAS AB	4959	73
2009	Swedbank AB	1501	73
2010	PA Resources AB	1761	63
2009	Husqvarna	3059	59
2010	Rörvik Timber AB	249	20
2013	Retail and Brands AB	463	16
2013	Nordic Mines AB	282	13

*Companies that paid the ten highest excess returns to underwriters*

Year	Company	Diff price & put in percentage points
2012	Botnia	17,95%
2011	Deflamo	11,75%
2013	Image Systems AB	9,76%
2013	Anoto Group AB	8,97%
2010	Scirocco	8,48%
2011	Digital vision (image system)	8,41%
2013	Cefour Wine and Beverage AB	7,94%
2010	Rörvik Timber AB	7,84%
2011	Commodity Quest	7,71%
2010	Commodity Quest AB	7,65%