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Long-run IPO performance on the Swedish equity market between 2004-2014

- *Compared with Private Equity backed IPOs*

Abstract:

This paper investigates the long-run underperformance phenomenon of IPOs on the Swedish equity market between 2004-2014, using a sample of 53 IPO companies from Nasdaq OMX Stockholm. Also, the long-run performance of all IPOs during this time-period is compared with private equity backed IPOs separately. Our rationale for looking into this is to examine how our evidence from the Swedish market relates to previous studies within this area of research. We examine the long-run performance by calculating the abnormal returns of our companies via both buy-and-hold abnormal returns ("BHAR") and cumulative abnormal returns ("CAR") methods. The investigation is conducted through event time studies, using two weighting methods, where returns were evaluated after 36 months. We use a risk-adjusted benchmark and control for market capitalization, book-to-market and a number of additional company specific variables.

For the total IPOs, we find positive abnormal results from BHAR and CAR ranging between 8.6-12.9% suggesting Swedish IPOs overperformed in the long run. However, when investigating the private equity backed IPOs separately, our findings suggest that they underperformed during the same time period using all methods except for the value weighted BHAR.

Keywords; *IPO, BHAR, CAR, PE, VC, Nasdaq OMX Stockholm, Abnormal return, Value weighting, Equally weighting, Long-run performance*

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1. INTRODUCTION

1.1 Background

Most historical studies on Initial Public Offering ("IPO") performance have focused on the short-run underperformance phenomenon. Studies on long-run performance started to gain attention after Ritter (1991) found evidence on the US equity market supporting this. However, evidence of long-run underperformance had been found on equity markets in a number of countries also prior to this. The IPO is, according to Ritter's paper, overpriced on the IPO date, causing the IPO firm to underperform in the long run relative to a benchmark of similar size and industry origin. In addition to the long-run underperformance phenomenon, researchers are trying to investigate which major factors that contribute to this event taking place. One of the determinants, which a number of studies have looked into, is whether Private Equity ("PE") firms affect underperformance and if they can work as a certifier and actually impacts the underperformance to decrease in the long run. The long-run underperformance is noted in various countries internationally, not limited to the US, but many of the studies tend to have retrieved their research data samples from the US market. Furthermore, two other important studies within this area that received long-run underperformance results were Loughran & Ritter (1995) and Brav et al. (2000).

The size and book-to-market ratios of the firms are two important determinants of long-run performance that need to be controlled for in the regression build-up when investigating this phenomenon. A number of past studies, such as Gompers & Lerner (2003), find that such company characteristics play a crucial part in determining whether IPOs underperform or not in the long run. However, there are additional important factors, and one of them suggests that the more discretionary accruals a company is using, the more underpricing it will yield which in turn affects long-run performance. This is explained by the fact that small firms tend use more discretionary accruals versus large firms. An interesting thought is whether private equity backed firms with their professionalism and experience therefore can decrease the discretionary accruals, thus reduce the underpricing and further affect long run performance or if it is just a case with small firms, Brav et al. (2000).

Looking at PE-backed firms, past research studies have mostly found PE backed IPOs to in fact yield less underperformance in the long run relative to non-PE backed IPOs. Researchers explain this through the certification hypothesis (discussed later in our theoretical section) that will partly mitigate of the long-run underperformance. There is not a single exclusive theory explaining the phenomenon of long-run under-or overperformance, rather the focus appears to be on proving whether this phenomenon actually exists or not, and finding the most accurate measurement methodology to apply. So far, the most reliable approach has been found to be using value weighted abnormal returns and applying the BHAR measurement. Concluding remarks are that there are evidences pointing in both directions on whether performance in in the long run is positive or negative, and that specifying the measurement may be most important part when measuring long-run abnormal returns. Our theoretical background consists of the most widely accepted ideas of what can cause long-run performance turning negative or positive. The point being that the actual phenomenon of long-run performance existing or not is more of the issue here, rather than any of the theories that possibly could explain it.

1.2 Problem

The purpose of this paper is to elaborate on above-mentioned previous research and investigate the presence and thereafter the magnitude of any long-run over-or underperformance on the Swedish equity market via the Nasdaq OMX Stockholm stock exchange during our chosen time period. We retrieved all IPOs that have taken place between 2004-2014, following our screening process discussed later in this paper. This time period was chosen as we consider it sufficiently long to cover the closest years prior to and after the 2007/2008 financial crisis on the Swedish equity market, while still being able to provide findings from a relatively recent time period. Hence, we will cover important systematic cycles that have taken place on the Swedish equity market in recent years. By including companies from Nasdaq OMX Stockholm, we had a total of 53 IPOs during our period of estimation after the screening criterions. To our knowledge, this time period has not previously been investigated in purposes of long-run underperformance in Sweden as of date. Moreover, we investigate whether there are any systematic differences in long-run IPO performance between PE backed and non-PE backed issuers.

In this study, we make use of the event time approach, which is one of the most common methods to investigate the long-run performance. Within this approach, we apply various measuring tools including Buy-and-hold abnormal returns ("BHAR") and Cumulative abnormal returns ("CAR") to which we apply both value weights and equally weights. Finally, we are looking to receive accurate estimates by using these different measuring methodologies and concepts on Swedish IPOs after three years. The method of measurement of long-run performance post-IPO is the most important and even if there is not a unified model to be used from past research when measuring long-run performance, we use several methods to be able to compare our results to those in the literature. Thus, we are interested in putting the Swedish equity market, via Nasdaq OMX Stockholm, in relation to other countries and their long-run performance for our entire IPO sample as well as the PE backed IPO separately.

In the light of the above-mentioned problem, we have states the following research question; What has been the long-run performance after three years of Swedish IPO firms from Nasdaq OMX Stockholm between 2004-2014? Further, have PE backed IPOs from the same market and time period performed differently?

2. THEORETICAL FRAMEWORK

We will introduce studies that have found both under-and overperformance in the long run. Thereafter, we discuss the impact of PE backed firms, and finally put forth the general theories that are used to explain long-run under-and overperformance. Those general theories often times include a number of behavioral theories and we will therefore discuss major behavioral theories as well.

2.1 Long-run underperformance of IPOs

The phenomenon of underperformance in the long run is found globally in many of the previous studies. In the literature it is sometimes referred to as the "New issues puzzle". There are also those who find the long-run underperformance to be a result of inadequate statistical methodologies.

One of the initial researchers behind long-run performance discoveries and a much-cited paper is the one of Ritter (1991). In his study he examines long-run performance in the years between 1975-1984 on the US equity market, using a sample of 1,526 companies. He finds that when using BHAR, an investor that invests one dollar at an IPO, will receive 83 cents after three years on average. His finds that long-run underperformance is evident on the US market. Further, he believes this is due to that investors are overoptimistic about the companies and will thus misprice them. Also, he finds that opportunistic firms take advantage of this situation. Those ideas were later recognized as market timing and pseudo market timing theories. His results also point to the fact that long-run underperformance does not last much longer than three years after the IPO, why we also chose three years of abnormal return measurement to be sufficient in our paper.

More results in line with Ritter would follow, and in accordance with their results, Loughran & Ritter (1995) investigated the five-year returns between 1970 and 1990 in the US in a sample of 4,753 IPOs. They find that those who invest in IPOs would have to buy 44% more stocks than those who invest in seasoned equity, in order to end up with the same value of their investment after five years, which further indicates long-run underperformance. The difference between equally weighted and value weighted returns were only marginal. Their benchmarks in this case were indices and also comparable companies to the ones that go

public and were of similar size and within the same industries i.e. risk characteristics. Loughran & Ritter (1995) apply the Three-factor model, and find that book-to-market values only account for a small portion of the underperformance. They believe, in line with Ritter (1991), that their results proves that firms are issuing equity when highly valued or even overpriced. Whether firms issue equity when overvalued or not is explained through opportunistic behavior, market timing hypothesis or because of a collected misbelief amongst investors that prices should be higher i.e. pseudo market timing, which we will discuss more extensively in a later section.

In the first consecutive years after evidence of underperformance by Ritter (1991), Brav et al. (2000) also found results of long-run underperformance. However, they highlight and discuss the issue of misspecification in the regressions where they find that the Fama-French model managed to remove underperformance. Moreover, the companies that had the greatest underperformance were the small ones in terms of market capitalization, with low book-to-market ratios, which other studies have also found. Furthermore, there are other factors or determinants that affect the underperformance post-IPO. Private equity firms are among those, which we will discuss in the private equity section. Additional determinants are discretionary accruals, which are positively correlated with long-run underperformance, and one explanation to this is that small companies often tend to show large discretionary accruals.

Between 1975 and 1992, Brav et al. (2000) found that on the US equity market, IPOs performed similarly as firms that were not going public, while controlling for size and book-to-market ratios. This is contradictory to Ritter (1991), as they have found that long-run underperformance is mitigated when controlling for size and book-to-market ratios. Although many long-run performance studies point towards underperformance, Fama (1998) challenged the very existence of the underperformance anomaly. Fama found that if one makes good enough adjustments to their model, the mispricing will disappear. This is very much contradictory to most of the studies looking at long-run performance, even though many of the authors acknowledged issues of measurement. Furthermore, Fama also found that underperformance will decrease as we use value weighted returns in comparison to equally weighted and keep the discussion to the fact that efficient markets still hold and that underperformance cannot exist. He suggests that the efficient market hypothesis exists, hence rejecting the presence of market timing hypothesis and leaving room for pseudo market hypothesis, as it does not require markets to be inefficient. There is a widely accepted idea

that some markets are efficient and capture information more efficiently relative to other market, leading to less long-run underperformance. This is an argument used in the paper shown in a review study by Loughran et al. (1994) evaluating the long-run performance in several countries. In the paper, results indicated of both under-and overperformance in the long run.

2.2 Long-run overperformance of IPOs

The long-run overperformance of IPOs is an anomaly that has not gained much attention relative to long-run underperformance previously discussed. Most of the literature results on long-run IPO performance find evidences of underperformance, and then it only comes natural that most of the focus has been on finding theories explaining this historically. However, long-run overperformance following IPOs are still found in research papers based a number of countries, but these theories are relatively less developed.

In a study by Kim et al. (1995) based on the South Korean equity market, IPOs were overperforming relative to other seasoned firms in the market by 59.01% between the years 1985-1989, using a sample of 169 firms. In their study, they use the BHAR approach against a South Korean composite index benchmark. This result excludes the first day of trading due to the noise generally coming from the underpricing phenomenon on the initial IPO trading day. When excluding the first month of trading, the overperformance decreased to only 4.67%, which is very low and suggests no real long-run overperformance. They argue that it is the first month that contains the overperformance, and the IPO would perform almost on par with the seasoned equities, absent the first month. Further, Kim et. al (1995) also argue that the reason for not receiving underperformance in South Korea is due to that equity market being more established in terms of IPO execution experience, which is a country effect rather than a theory itself. Some critique on this study came from Loughran et al. (1994). They stressed that the size and length of the sample of just a few years were not sufficiently large in the study. South Korea is also an emerging market which may give some sense to the reason for the country effect. It is also said that “high causality bias”, i.e. companies that delist their stocks due to financial distress, will enhance the effects of long-run underperformance. This was evident in many of the findings in the paper of Ritter (1991), but no delisting was found in South Korea. In their paper, Kim et. al (1995) argues that large

underpricing leads to an overperformance during the first month where the prices reach the intrinsic values and after that no real overperformance is found.

On the Vietnamese equity market, when using equally weights in the BHAR approach, the long-run overperformance was found to be in the range of 14-19%. With the CAR approach, it was found using two different index benchmarks and measured c. 30%. The IPO sample in this study included 454 companies between the years 1990-2000 where overperformance was only found when using two different index benchmarks, but no overperformance found when using neither value weights nor similar companies as benchmarks (Ahmad-Zaluki et al., 2007).

Moving on to the Swedish equity market, Loughran et al. (1995) studied the Swedish market, reaching the conclusion that Swedish IPOs are slightly overperforming in the long run by 1.2%. Another study on the Swedish equity market by Thorsell & Isaksson (2014) applied a sample of 130 IPOs between 1996-2006 using BHAR and found evidence of overperformance of 19% in the first year and a modest 0.8% in the second year. Lastly, Schuster (2003) also received overperformance in his study, but just at the 36 month mark. He found that abnormal returns during his long-run study goes from positive the first years and then negative in the final years.

To get an overview of the Nordic countries (Denmark, Finland, Norway, Sweden, Island), Westerholm (2006) reviewed the long-run performance during the years 1991-2002 on these equity markets respectively. Their main findings suggest that temporary overvaluation has an effect on long-run performance, and also that the high regulatory listing requirements in the Nordic countries generally remove the underperformance effect. Further, in this paper, Westerholm (2006) find that the stock exchanges in the Nordic countries apply very extensive requirements for companies wanting to be listed on the Nordic Nasdaq OMX stock exchanges such as Nasdaq OMX Helsinki etc. The entry requirements are equal or higher in the Nordic countries than in the rest of European equity markets in terms financial requirements and history. This is what makes the Nordic equity markets less prone to underperformance and actually increases the IPO performance according to Westerholm (2006). The requirements are also higher relative to the corresponding stock exchanges in the US. In Westerholm (2006), underperformance of 3.8% and 12.6% was found on the Swedish and Finnish equity markets respectively. Furthermore, the Norwegian and Danish equity markets estimated an overperformance of 3.3% and 0.3% respectively. In all of these

measurements, the BHAR approach and composite index benchmarks were applied. Lastly, the underperformance was found to be more severe in cases where companies engaged in IPOs during intensive periods in terms of IPO frequency within their respective industries.

Ritter (1991) argues that companies take advantage of market highs. Hence, companies issuing IPOs yields underperformance where investors overestimate the expected return of those IPOs. This is countered by the prospect theory suggesting that while investors are aware of that the expected average return is lower, there is a chance of gaining extraordinary returns, which is a case related to when playing the lottery. Shiller (1990) provides the idea of fads, i.e. market highs, where long-run performance is negatively correlated with short-run underpricing, which many of the past studies find evidence of.

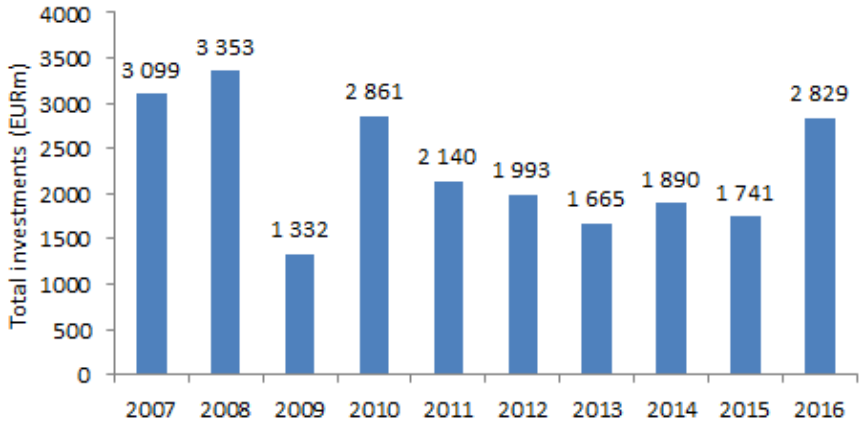
2.3 Private equity firms

In this section, we will firstly discuss the presence of PE firms in Sweden followed by an elaboration in 2.3.2 on their effect on long-run performance, which has mostly been positive. Finally, in 2.3.3, there is a discussion of why PE firms will decrease performance of the backed firm. Hence, there are theories presented of both positive and negative long-run performance impact.

2.3.1 Swedish Private Equity market overview

Stockholm is generally viewed as the finance capital in Scandinavia, and particularly by far the most important finance hub in Sweden. In Stockholm, the private equity industry is relatively larger than many comparable cities and supports a large financial ecosystem of Equity Capital Markets ("ECM"). In the last ten years, some 1,000 firms have received PE-backing in Sweden, amounting to c.EUR 15 bn of PE capital, which is approximately of the same size as the total IPO capital provided on the Stockholm Stock Exchange during the same time period. The bar chart below shows the total amount of investments (i.e. equity and debt capital) historically provided by PE firms in Sweden, Swedish Private Equity Market - A Footprint analysis, Copenhagen Economics (2017).

Figure 2.1 Total amount of investments from PE firms in Sweden historically



The amount of PE capital raised equals c. 5.5% of the Swedish GDP and accounts for c. 7.5% of Swedish private employees. Through active ownership and operational improvements, it has been empirically shown that Swedish PE firms have on average improved profitability, competitiveness, productivity and the value of R&D investments as well as patents, of their portfolio companies, Swedish Private Equity Market - A Footprint analysis, Copenhagen Economics (2017).

2.3.2 Aftermarket performance in the presence of PE firms

VC and buyout firms are both two types of players within the wide private equity sphere, and are similar in the way they strive to improve their portfolio companies financially during a short period of usually 4-7 years. These strategies are similar, except that VCs normally invest in earlier stages i.e. they target younger companies, and hence assume a relatively higher risk. Both strategies require extensive investment expertise and to raise sufficient amounts of capital from limited partners. However, buyout firms specifically use a high degree of leverage in their financing to acquire their investment and normally acquire significant stakes in order to be eligible to materialize assumed strategic and financial initiatives. There are some evidence that the VC firms do not require as much underpricing in their IPO as other non-VC backed firms. This is because the VC firm can issue a higher price the first day because of their professionalism and brand but non-VC backed firms does not have this and causing their issue price to be lower.

There are several ways for these PE investors to realize their investments; IPOs, trade sales, dividend recapitalizations, selling to another VC or PE firm and liquidation of the company. The most common way is to go for an IPO and in those cases the investor receives positive returns 96% of the time in comparison to acquisition by another company that is the second most common way to exit have on average only 35% chance of positive returns. VC firms monitor the company they invest in and keep their investments at least a year after the IPO (Barry et.al, 1990). In addition, PE firms including VC, will improve the professionalism of the companies they invest in, even though most of the effect takes place in the early stages of entering a company before it goes public. Therefore, the performance post-IPO should also be affected by whether a company is VC backed or non-VC backed, Hellman & Puri (2002).

The reason why underperformance in PE backed firms can be lower than those of non-PE backed firms can be derived from the certification hypothesis. The certification hypothesis states that PE firms bring professionalism, expert human capital and corporate governance to the firms they invest in, thereby contributing to a sustainable value-add to the portfolio company. PE firms are continuously exiting through IPOs and it is crucial for them that the firms they invest in generate solid returns to be able to attract additional future capital from investors and limited partners for upcoming projects, Minardi et al. (2012). Additional evidence of long-run underperformance was shown by Brav & Gompers (1997). They re-ran the study of Loughran & Ritter (1995) and also found non-VC backed companies to underperform VC-backed companies in the long run when using equally weighted returns. These equally weighted returns are, according to Fama (1997), one of the reasons why we experience a return anomaly for VC-backed firms.

There has been an increasing PE presence in Brazil, and Minardi et al. (2012) found by using CAR, that PE backed IPOs were decreasing the underperformance in the long run, relative to non-PE backed firms. PE backed firms measured one year after an IPO in the years between 2004 and 2006 had a CAR of 13.72% whereas non-PE backed firms had negative returns of -3.23%. When looking into the IPOs executed between 2007-2008 and measuring their respective one-year returns, PE backed firms received a CAR of -38.45% and non-PE backed firms received a CAR of 44.87%. During the financial crisis of 2007/ 2008, both types of IPOs were heavily affected, but particularly the non-PE backed firms. It was the small growth companies that were most severely affected by the financial crisis and this is also evident in the study on this matter conducted by Gompers & Lerner (2003).

2.3.3 Why PE backed firms will not outperform non-PE backed

Most of the theoretical frameworks are based on reasons why PE would outperform non-PE backed IPOs even if they still underperform the market. However, there are some evidence pointing the other way. In an IPO, the selling entrepreneur or founder has to transfer share capital and voting rights to the new acquirers. This situation may lead to problems aligning the company to the successful strategy of the entrepreneur and instead mixing it with the new investors interests, leaving the company less efficient. Conflicts between the entrepreneur and the investors, such as PE firms, may also negatively affect the long-run performance. PE firms may reject investments that are incremental to the short-run return on investment of the closest 1-2 years after the IPO in order to maximize their profits, as these type of investors only stay for an average of 1.69 years post-IPO. This then leads to underperformance as these investments and other actions that are needed for long term performance are postponed for short term success.

As the PE firms generally make realize their investments at the IPO event, they could be inclined to push the date of the IPO to take place earlier than what is in the best interest for the stock's long run performance. This means that they engage in "grandstanding" where the PE firm tries to quickly establish status to attract new investors for future projects by realizing successful investments early. This is typical for young VC firms trying to build a reputation among limited partners and within the equity market in general, Brown (2005). There are different opinions on what the intrinsic value is in an IPO due to information asymmetry, but in the aftermarket of the IPO, prices will tend to converge into the intrinsic value. When this happens, the prices decrease because the intrinsic value is below the current price and underperformance is a fact. If the company is PE backed, there would be less information asymmetry and prices would already reflect their respective intrinsic values at the time of the IPO. This would lead to less underperformance. On the other hand, if PE firms are better in finding market highs to issue their IPO, the PE firm would actually suffer from more underperformance than a non-PE backed company by using the window of opportunity. The long-run performance is not that important to PE firms if they intend to leave after only a few years, Bergström et al. (2006).

2.4 Main theories explaining long-run performance

These are the major theories currently available to explain performance in the long run which also include behavioral theories such as prospect theory. Some of these theories are related to others e.g. market timing and prospect theory.

2.4.1 Pseudo market timing and Market timing hypothesis

Market timing is firm-specific and comes from that investors are overoptimistic. A number of researchers explain the fact that event time studies generally face more underperformance than calendar time studies through behavioural reasons captured within the pseudo market-timing hypothesis. In their study, Ball et. al. (2011) explain pseudo market timing as a theory coming from good market conditions. It explains why IPOs underperform in the long run, but only for small samples, as the this underperformance tends to disappear when using larger samples or if using calendar time approach instead of event time. The hypothesis states that the long-run underperformance is an illusion coming from high abnormal returns clustering around when markets are peaking, Ball et. al (2011). This suggests that firms will engage in IPOS when their ex ante (i.e. before the fact) beliefs are that prices will increase, and the higher the price the more firms will go public due to a belief of ramp-up in prices. In ex post (i.e. after the fact), it is shown that managers cannot time the market, and if all investors believe that prices will rise, more and more investors follow and eventually this leads to an overvalued stock that will drop and decrease back to its intrinsic value. Hence the presence of underperformance in the long run. The core idea with this hypothesis is that ex ante expectations of returns are wrong and lead to ex post underperformance, Schultz (2003). There is an alternative view that markets do not need to be inefficient, there would be underperformance in the long run anyway. Both market timing and pseudo market timing are possible explanations for long-run underperformance discussed below, even though pseudo market timing is considered the most probable one.

Furthermore, Batninni & Hami (2015) explain that even if IPO is one of the ways to receive financing, companies may engage in it at different phases. The reason may indeed be that the management believes that the market is “hot” or that “favorable” market conditions exist, and prices are high and will increase which is suitable for launching an IPO, even when they are not in actual need of financing. In contrary to this, the companies that issue during “cold” market conditions would be those that are in desperate need of financing.

The Pseudo market timing is different from market timing; the event that managers can predict prices of IPOs, hence buying stocks when they are undervalued and selling when overvalued. Both of these timing theories are said to go against the efficient market hypothesis, because existing investors can derive wealth from new investors. A study by Dahlqvist & de Jong (2008) that was testing the pseudo market timing shows that pseudo market timing is only a problem in small samples. Further, it is very small in medium-sized samples, whilst it does not exist in large samples, Dahlqvist & de Jong (2008).

If there were to be evidence of actual market timing, it is most likely to be found in Venture Capital ("VC") firms when they go public. They are accustomed to such events as it is a part of their business model to go public and should be able to time the market better as professionals. Furthermore, Ball et al. (2011), found no evidence of market timing in VCs but they find evidence of pseudo market timing (Market condition hypothesis) in VCs. This shows that it is more likely that underperformance is due to a ramp-up in prices which is recognized as pseudo market timing, rather than firms have information about real prices and trade on those that would lead to market timing.

2.4.2 Prospect theory

This is an elaboration of the theory from Kahneman & Tversky (1979) that explains the actual rational behavior of what often can seem to be perceived to be irrational. Investors, according to the Prospect theory, overestimate small probabilities of high returns and underestimate the probabilities of a solid return. If applied into the case of IPOs, the investor will commit to the IPO with hopes of high returns. The IPO does indeed have a higher probability of yielding a high abnormal return, in contrary to seasoned stocks, but investors then overvalue this probability and they invest too much at the IPO. IPOs have a more skewed distribution, with a lower long-run average return than seasoned stocks, leaving these two options with two different return distributions. The underperformance, according to Ma et al. (2005), is not a puzzle according to prospect theory, that will make investors indifferent between seasoned stock and IPO at a certain return distribution. According to prospect theory, IPOs do not underperform, the slope of the return curve is because the investor accepts the average underperformance due to a possibility of extreme high returns similar to the lottery.

Further Ma et al. (2005) find three reasons for long-run underperformance, but the main criticism against them are that they require investors to be irrational, in contrary to prospect theory, which allows investors to value probabilities and be rational in their choices. The three reasons are (1) No shorting option; there are limits to shorting IPOs and the investors at IPOs consist of the most optimistic ones, which causes high initial prices and lower long-run returns. (2) Fads; During fads (market highs) the companies will engage in IPOs to take advantage of investors over-optimism. (3) Window dressing; Manipulation of figures to make companies look more appealing will, in the long run, be realized and value will decrease down to the fundamental value.

2.4.3 Asymmetric information

In general, this theory refers to a situation where one party has an information advantage over the other party, which ultimately may lead to opportunistic behavior, where the more informed party exploits the party with information disadvantage Perloff (2004, p.637-638). Asymmetric information theories are further used when evaluating IPOs and also feeds into other theories e.g. market timing. A commonly applied theory is derived from Rock (1986) and refers to a situation called "winner's curse". Here, it is assumed that, prior to an IPO, the investors have different degrees information and perceptions about the initial fair price of the shares, and perfectly informed investors will only agree on acquiring stocks if the fair value price exceeds the issuing price set by the issuer and underwriter(s).
At the same time, uninformed investors may acquire shares in all IPOs, especially in unattractive offerings from the informed investor's point of view, and this situation may lead to a "winner's curse" for them. To address this issue and keep potential uninformed investors, the issuer and underwriter(s) will have to include a discount and hence underprice the IPOs issuing price which lead to long-run underperformance.

Two ways of explaining the windows of opportunity taken by investors are due to asymmetric information and investor optimism. The asymmetric information theory comes from Jensen and Meckling (1976) where they argue that the reasons why companies issue equity is that they know more than the investors, leaving them in an advantageous situation and an equity offering should be recognized as an overvaluation of the company. It means that it will be too expensive to engage in an IPO if there are large information asymmetries that require a discount for investors. But if there are many similar companies in the market

doing IPOs, companies can get a reasonable price for their company due to investors using multiple analysis comparing these firms. If undervalued firms issue at this time, they will be able to get high prices as the peer multiple analysis will find these firms to be healthier. Westerholm (2006) argues that investor over-optimism is the reason for underperformance and asymmetric information is more linked to the underpricing. In essence, they believe that investors invest in market highs, which is continued with more IPO issuing and the correction of prices in those high periods to the fundamental value cause underperformance.

2.4.4 Signaling theory

Signaling theories are, together with book-building theories, important theories within long-run IPO underperformance sphere. Issuers target a relatively low offering price in order to drive the stock price upwards in subsequent periods in absence of signaling. In reality, the predictions made by signaling models have shown weak support empirically and hence the feature of firms signaling through underpricing is an inconsistent and a weak explanation of long-run underperformance of IPOs. However, Carter & Manaster (1990) present a signaling model, which could explain long-run underperformance. Their model is consistent with the framework of Rock (1986) where he argued that the price increase shortly after the IPO compensates uninformed investors for the excessive risk they take by investing at the IPO leading to underperformance in the long run.

2.4.5 Book-building theories

The book-building model by Beneveniste & Spindt (1989) suggests that investors are inclined and incentivized to reveal negative information. This will mislead the issuer and underwriter(s) to set a lower offering price. On the contrary, more positive and truthful information revealed by investors will trigger the initial price, closer to the fair price. The issuer and underwriter(s) strive to set an initial offering price as close as possible to fair price, which gives investors an information advantage according to this theory. This will lead to an inconsistent price revision, which the issuer and underwriter(s) are aware of, and they will therefore retain some capital as an incentive for investors who actually reveal their information truthfully. As it is argued by Beneveniste & Spindt (1989) that the initial offering price is positively correlated with post-IPO performance, deceptive information revelation by

investors will eventually lead to negative post-IPO performance and vice versa. Hence, this theory captures some explanation of the long-run underperformance of IPOs. Further, in her study, Hanley (1993) examines the long-run underperformance of IPOs and compares the final offering price with the preliminary offering price and finds no support for evidence of price revisions in explaining long-run performance, unlike what was found for short-run performance.

3. METHOD

We seek to receive as objective results as possible when measuring long-term performance of all IPOs and PE backed IPOs on the Swedish equity market. Thus, rather than aiming to find the single most reliable model, we conduct a broader set of methodologies and approaches for weighting and measuring abnormal returns. In order to provide objective findings, we apply both value weighted and equally weighted abnormal returns. We calculate the monthly abnormal returns by measuring risk-adjusted expected returns (i.e. CAPM) as the corresponding benchmark for all IPOs, which we discuss in this section. Further, within our event time study, we apply both Buy-and-hold abnormal returns ("BHAR") and Cumulative abnormal returns ("CAR") approaches. We have chosen a 36 month horizon when measuring long-run performance, but we still incorporate the results after 12 and 24 months in our findings for discussion purposes. As to mitigate the short-term effect of underpricing, the issuance month was excluded for all IPOs.

We will begin the section by discussing our CAPM benchmark model as it is an important foundation in our methodology to achieve risk adjusted abnormal returns. Thereafter, we introduce and discuss the measuring process and approaches that were applied as well as excluded by us.

3.1 CAPM Benchmark

In order to measure the monthly raw returns for each IPO company, we apply the following formula on the retrieved monthly share price data:

$$r_{i,t} = \left(P_{i,t} - P_{i,t-1}\right) / \left(P_{i,t-1}\right)$$

Where;

$r_{i,t}$ *= Monthly raw return for IPO company i in month t after IPO*

$P_{i,t}$ *= Share price of IPO company i in month t after IPO*

$P_{i,t-1}$ *= Share price of IPO company i in month t-1 (i.e previous month) after IPO*

As a benchmark to our monthly raw returns, we use the CAPM-model in order to capture the risk adjusted expected returns in the regression and return evaluation. The CAPM formula states that the expected return of an asset equals the risk-free rate of return plus the beta value

of that asset multiplied by the equity risk premium based on the market where the asset is listed. The formula is the following;

$$R_i = R_f + \beta_i \times (R_m - R_f)$$

Where;

R_i = *Return on asset i*

R_f = *Risk-free rate of return*

β_i = *Beta-value of of asset i*

R_m = *Return on the market portfolio*

$(R_m - R_f)$ = *Equity risk premium on the market*

The expected risk-adjusted returns (i.e. CAPM-value) of each asset, was derived for each month and the calculation methodology used was the following; First, we retrieved data from the Swedish central bank ("Riksbanken") on the ten-year government bond yields, which tends to mimic the risk-free rate. As this yield varies across years, we gathered the yearly historical rates for all years used in our sample. Therefore, the risk-free rate of return remains constant throughout each year in our sample, but varies across years. Further, we have applied the regression method in order to calculate the Beta value. The formula using regression Beta-value is as follows;

$$\beta_i = \frac{Cov(R_i, R_b)}{Var(R_b)}$$

Where;

β_i = *Beta value of company/asset i*

R_i = *Monthly stock return (%) of company/asset i*

R_b = *Monthly benchmark return (%) of index benchmark b*

The formula states that the Beta-value of an asset equals the covariance of that stock and the index benchmark, in this case OMXSPI, divided by the variance of that same index benchmark. Because we have monthly data, the monthly raw returns of each stock are

regressed against the monthly returns of the OMXSPI such that that time period in time for that month is same in both the asset and the OMXSPI. To get as reliable and unbiased regression as possible, we want to use as long time horizon as possible. Because each IPO firm is evaluated for up to three years, we have used that entire time window as our horizon for each firm. This means that the regression is applied on the first historical observation date for each stock (in our case after one calendar month of listing) and captures the 36 consecutive months, leaving us with one single leveraged Beta-value for each firm, that we hold constant throughout the 36 months.

We also want to emphasize that one must bear in mind that pre-IPO, no firm has any observable stock price and hence no actual Beta-value. Instead, this must be estimated, either by conducting forward regressions as in our case, or by estimating a reasonable Beta-value derived from public peers in the relevant industry. None of this methods will be ultimately accurate and both face pros and cons. Further, gathering data on yearly equity risk premiums, we have used PWC yearly market risk premium publication where a yearly premium based on the OMX Stockholm is estimated. Hence, our estimated Beta-values are the only variable in the CAPM that we hold constant throughout 36 calendar months for each firm. The other variables will vary across years but not across firms.

As previously stated we are using the CAPM model as our expected rate of return in order to measure our abnormal returns. In order to calculate appropriate regression beta-values, we use the OMXSPI index to regress against our monthly return data for each IPO firm.

In the long-run studies that compare stock returns to a benchmark, it is of high importance to use a well-functioning benchmark to not end up with biased results because it is one of the major factor in retrieving abnormal returns. According to Barber & Lyon (1997), the three major benchmarks used are indices, portfolios of firms matching the same characteristics of the firm you wish to evaluate and the three factor Fama-French portfolio. The first and third of these benchmark methods yield biased results for various reasons. In the case of the first benchmark, it is because the index used will not match the risk characteristics of your companies when calculating abnormal returns for each of them. The second benchmark, where we control for matching characteristics, will not suffer from new listing bias, skewness or rebalancing bias in comparison to the other two methods. It can thus be the efficient benchmark to use. But issue with the second benchmarking, i.e. benchmarking against the industry, works best if your company is a small part of that industry. This is because if the

company is a large part of the industry index, you will probably have to remove it from the industry to be able to benchmark against it. But if you choose to remove a company that had 70% part of that from the industry, the benchmark will be smaller than the company itself which may remove the incentive to use such a benchmark. Another alternative would be to use a benchmark consisting of one perfect peer in the same industry with similar market cap and debt-to-equity ratio, which is often used as a substitute for risk in a company. However, it is very difficult to find perfect peers, but it would still be necessary to find very similar ones in order to yield accurate risk-adjusted returns.

Among others, Westerholm (2006) used a broad market index and argued that it is the best way to retrieve abnormal returns. The problem is that the broad market index is not risk-adjusting the returns but using the CAPM model as we do alleviates that issue. Another study who use risk-adjusted benchmarks is Bergström (2006) who argued that the risky return of the company should be compared to a benchmark of similar risk, like the CAPM model we are using.

3.2 Value weighting and equal weighting

When evaluating abnormal returns against a benchmark to assess long-run performance, past research papers generally apply either or both value weighting and equal weighting. We have chosen to apply both of them in order to reach objectivity as well as to compare our findings with previous studies that have used both or either of these two weighting methods.

To arrive to the value weighted returns, we first sum up the respective market capitalizations ("market caps") of all IPO companies from our sample that are public that month, in SEKm. We then summarized those market cap figures together to get the total market cap per each month for all companies in our sample, and follow the same procedure for the consecutive months. To arrive to the value weights, each company's monthly market cap is divided by the total market cap for that month, which yields each company's weight in terms of market cap to the total market cap per month, as seen in the equation below.

$$w_i^{Value\ weighting} = MV_i \,/\, \sum MV_i$$

This value weight is then multiplied by the abnormal return for the company, which yields the value weighted abnormal return.

The equally weighted returns are calculated as 1 divided by the total number of companies that are public during that month, as seen in the equation below.

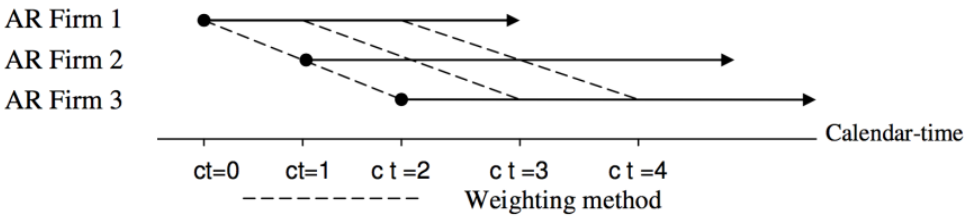
$$w_i^{Equally\ weighting} = 1\ /\ N$$

That figure is then multiplied by the abnormal return of the IPO company for each consecutive to arrive to the equally weighted abnormal returns in each month.

3.3 Event time

Gompers & Lerner (2003) amongst others find evidence of long-run underperformance when using event time and BHAR approach, which also makes it interesting for us to include this approach in our methodology and compare the our findings. Furthermore, Schultz (2003) describes the event time approach as being a method to measure returns between stocks in different months but for the same number of month after an IPO. Studies have found that event time studies will show greater underperformance in the long run versus calendar time studies. In the event time, we focus on the event irrespective of which month or year the IPO took place. Hence, we compare first calendar month post IPO between company X and Y irrespective of which month or year the IPOs were initiated. We continue this approach for the consecutive calendar months such that the second month after IPO is matched between companies even if they are in different years as previously mentioned. The event time approach will, according to Ahmad-Zaluki et al. (2007), cause the results to overperform, but calendar time approach tends to remove overperformance. To be more specific, the calendar time can reduce the overperformance effect.

Figure 3.1 Illustration of the event time measurement

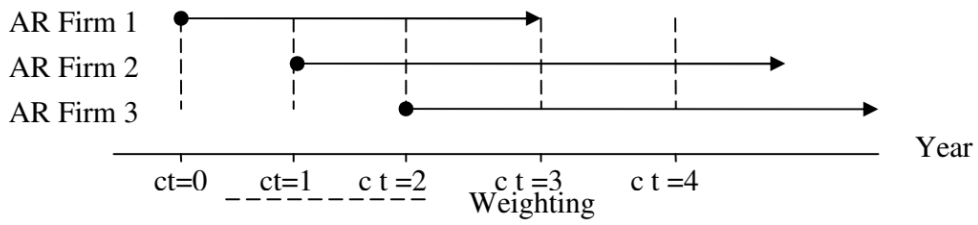


Where;

- *= Issue date*

3.4 Calendar time

Figure 3.2 Illustration of the calendar time measurement



Where;

● = *Issue date*

Here will only introduce the calendar time approach readers to know what additional methodology researchers within this area are applying. In the result part, we sometimes compare our event time results to previous findings that applied the calendar time. It is possible because there is no ultimate methodology to measure abnormal returns and evaluate long-run overperformance. This is an additional rationale for us to use a broader set of methods and approaches. When comparing our results to calendar time results, this will be specified in our result section.

Calendar time is a possible solution to the problem of pseudo market timing and cross sectional dependence in event time is to use calendar time instead. (Schultz, 2003). In this approach we are emphasizing the month and year in which the IPO took place in contrary to the event time approach, which focuses on the actual event irrespective of which month or year it happened. We cannot apply all methodologies applied in previous research studies within long-run performance evaluation. Moreover, an additional rationale for excluding the calendar time approach within our study that we considered is argued by Loughran & Ritter (2000), where they suggest that calendar time does not consider whether the managers are timing market highs for higher possible returns, which may lead to biased results. The abnormal returns will therefore be lower in calendar time method when managers are trying to time the market. Another reason to not use calendar time is that Ang & Zhang (2004) find this approach to be less effective the longer time periods, which applies to the three-year horizon that we have chosen.

3.5 BHAR

We have discussed equally and value weighted methods as well as the event time approach used in our data, and argued for why the calendar time approach was excluded in our study. Now we will calculate the abnormal returns and there are two commonly used models used in long run. Firstly we will discuss BHAR, followed by CAR.

Following the issuance month, the BHAR is measured as the difference between geometrically compounded return of stock i to sell the stock at time T, and the geometrically compounded benchmark return. In our case, we have 53 IPO stocks and use a measuring horizon of T=36. Below we have listed the BHAR formula and its components.

$$BHAR_{0,T}^{i} = \prod_{t=1}^{T}\left(1 + R_t^i\right) - \prod_{t=1}^{T}\left(1 + R_t^{Benchmark}\right)$$

Where;

R_t^i *= Return on stock i at time t*

$R_t^{Benchmark}$ *= Return on benchmark at time t*

One of the main differences between the BHAR and CAR methods is that BHAR measures geometrically compounded abnormal returns while the CAR the abnormal returns are measured in each month against a benchmark, arithmetically. The BHAR method is less biased than CAR, and is therefore a preferred method to apply in purposes of long-run performance evaluations. Barber & Lyon (1997) discuss about the best methodology to use when measuring long-run performance in their research paper. They suggest that using only the CAR method may imply drawing conclusions of positive abnormal returns when in fact they are negative. This is one of the reasons why we also use the BHAR method to be able to compare outcomes of the different methodologies. BHAR has a new listing bias, same as the CAR model but only when using index benchmarks. New listing bias occurs when benchmarking against an index in the long run where companies in the index are delisted or entering the index during the measurement period. In addition to this, the returns in the long run will be quite skewed which means that in the long run there can be a positive bias, but also just for index benchmarks.

Even though studies by Mitchell & Stafford (2000), Fama (1998) and Gompers et al. (2003) suggest that BHAR can overestimate any long-run under-or over performance, Ahmad-Zaluki and Campbell & Goodacre (2007) find that when applying BHAR, the overperformance will be much lower relative to applying CAR. This highlights previously mentioned issues regarding that there is no single optimal method to apply for purposes of long-run performance evaluation. Rather, past studies sometimes have conflicting arguments, which is why several methods and approaches should be applied to achieve objectivity.

We will first use the monthly raw returns of company X less the corresponding benchmark (CAPM) returns in order to arrive to the risk-adjusted abnormal returns. At this point we have received abnormal returns for each of the 36 calendar months (i.e. not trading months) for all companies. We then sum the following months after the issuing month for all companies using the event time approach until we reach 36 months. This column of total abnormal returns are multiplied with our corresponding equal weights and value weights separately. Both of these abnormal return columns are now accumulated such that the 36th month is the combination of all previous months multiplied by each other.

3.6 CAR

This approach is touched upon in the BHAR section. The CAR approach is, according to Barber & Lyon (1997), biased in several ways. First of all, as it is a biased predictor as it suffers from measurement bias. Its usefulness decreases in the long-run measurements versus the BHAR method. In addition, it suffers from new listing bias; making it positively biased in the long run this bias is only present when using index benchmarks. Our calculation of the CAR method is the same as described in BHAR, with the difference being that here we addition instead of multiplication to accumulate total returns. The formula for both the CAR approach and how we include value and equally weights are described below.

$$CAR_{1\ to\ T} = \sum_{t=1}^{T} AR_t$$

Where;

$$AR_t = \sum_{i=1}^{N} AR_t\, w_i ar_{i,t}$$

$ar_{i,t}$ = *Abnormal returns (difference between company and benchmark return) for company i in month t*

MV = Market Value

$w_i = MV_i \,/\, \sum MV_i$ *(value weighting)*

$w_i = 1 \,/\, N$ *(equally weighting)*

3.7 Control variables

As previously discussed, small caps and growth companies with low book-to-market ratios are more heavily affected by underpricing in the long run as discussed in Gompers & Lerner (2003), Minardi et al. (2012) and Brav et al. (2000). Therefore, we will control for both market capitalization (denoted "Size" in the regression output) and book-to-market (denoted "BtM" in the regression output) ratios. For the Size variable, we have used the first observable market capitalization figure, i.e. one calendar month post-IPO issuance, for each company which we held constant during the entire observable period. The same method was applied for the BtM variable, which we held constant throughout all 36 consecutive calendar months from the first month following the issuance month. As these are continuous variables, we have transformed these figures into logarithmic scales.

Further, we controlled for whether the company in question is PE-owned or not, through a dummy variable denoted "PE backed" in the regression output. Also, we wanted to control for whether PE companies maintained their stakes in their portfolio companies even after 36 months (denoted "PE remained after 3y" in the regression output). Since at some point, the intended business strategy by the PE company is realized, the PE company will look to realize its investment. There are several monetization strategies in this situation; trade sale, IPO and Dividend Recapitalization amongst others. The IPO path consists of the PE company selling a portion of its stake to the public, and eventually a full exit will be realized through follow-on equity offerings, Rosenbaum & Pearl, (2013). It is therefore important that we control for whether the PE company kept its stake in the portfolio company after three consecutive years.

Lastly, according to Ibbotson & Jaffe (1975) and Ritter (1980), a phenomenon called "Hot issue market" is explained to occur when IPOs have had extremely high returns. During the

last two decades, these periods have taken place several times. As we wanted to control for whether each IPO took place during a "hot" IPO market or not, we created a threshold at ten IPOs for each year during our time period. Thus, we evaluate the IPO market being "hot" or "cold" in terms of IPO frequency rather than in terms of returns. These two indicators are very related, as the number of IPOs will increase with higher returns on the equity market. The reason we opted for measuring IPO frequency rather than IPO return for this purpose was to set a reliable universal threshold, unaffected by relative market valuation. Setting a specific firm return on our chosen market and time period as a threshold would require subjective judgments; defining "high" market returns is very dependent on the time period evaluated and thus subject to debate. Therefore, our chosen threshold for what is considered a "hot" market is based on our IPO statistics from the sample; the highest number of IPOs was 29 in 2010 and the lowest was two in 2004 and 2009, and the average number throughout the years was eleven. In this way, a year that contained at least ten IPOs is considered a "hot" year relative to our sampling period. The control variable is denoted "Hot or Cold market" in our regression output. Thus, a market is accounted for being "hot" if there has been at least ten IPOs conducted in a year from the IPO companies in our sample. Generally, a company that has built up hype from investors are more prone to go public. Thus, a period with many IPOs will mimic such hot markets, in this case evaluated annually.

3.8 Sample selection

In this section we discuss our rational for choosing companies from Nasdaq OMX Stockholm, the screening process where we removed companies that did not fit our standards and how PE backed companies was identified.

3.8.1 Choice of stock exchange

Our interest has been to study the long-run performance on the Swedish equity market and to compare our findings with previous studies conducted on this market as well as in other equity markets internationally. We have included companies from the most heavily traded stock exchange in Sweden, Nasdaq OMX Stockholm. This exchange includes a small, medium and large cap list and we include all of them. Thus, we have excluded First North, Aktietorget and Nordic Growth Market ("NGM") as well as smaller stock exchanges such as Göteborgslistan. Aktietorget, which is amongst the largest platforms of the excluded stock

exchanges, was excluded as it is an unregulated exchange and may thus bias our long-run performance evaluation. Further, the NGM exchange was excluded as it a significantly smaller platform. It is already evident in a number of past research studies that growth firms and small-cap stocks affect underpricing the most, and we want to look at additional factors. We have chosen Nasdaq OMX Stockholm stock exchange due to its relatively larger size, higher liquidity and information availability. Even though it included a small-cap list, it is still relatively larger than the excluded lists and follows strict regulations in line with the two other Nasdaq OMX Stockholm lists. To be introduced on the Nasdaq OMX small cap list, companies need a free float of 25% and the companies are required to have at least 500 shareholders where each own shares at least worth EUR 500, which is not required by the other excluded exchanges and companies on their lists (Avanza, 2018, Nasdaq OMX Nordic, 2018).

Furthermore, the stocks listed on OMX Stockholm are traded more frequently, indicating more efficient prices that we consider tend to be closer the fundamental values on average, giving us more reliable results. At the same time, stocks on the smaller Swedish stock exchanges excluded in this study are not as heavily monitored by analysts and prices may deviate from fundamental values to a greater extent. On Nadsdaq OMX Stockholm, there are stricter, more universal and comprehensive accounting rules required. Finally, the larger stock exchanges have more comprehensive entry requirements in terms of rules and regulations for companies and hence their prices reflect a more stable and unbiased picture of the companies. We do not want to include companies with a greater chance of opportunistic behaviour in accounting numbers, and any obvious reason for mispricing when the stock is also not traded as heavily which is also more common in small growth companies. Nasdaq Nordic has an alternative platform called First North which includes stricter requirements relative to Aktietorget but not as strict as those applied on Nasdaq OMX Stockholm. We exclude First North for the same reasons of less mispricing in our results. Excluding small lists is a method also argued for and used by Minardi et al. (2013).

3.8.2 Screening of companies

The well-documented existence of underpricing in the short-run of IPOs lead to underperformance in the long run. Studies point to the fact that efficient markets should correctly price the stock following the issuance day, but in many studies, researchers

sometimes remove as much as the entire first issuance month to ensure complete removal of any underpricing effect. We are dividing our data set into months, starting retrieving data for each firm the second calendar month (i.e. not measured as a month of trading days) of trading and 36 calendar months forward. We thus remove the issuance month of each IPO in line with previous studies.

The companies that performed an IPO during our time horizon (i.e. between 2004-2014) need to be public for at least three years (i.e. 36 calendar months) as this is the time window in which we will measure returns and compare against our CAPM benchmark. Furthermore, as our paper is conducted during the first half of 2018, we chose to exclude the companies that went public later than 1st of January 2015, as we require three consecutive years of market data for each IPO company. In cases where the book-to-market ratios or market caps were not available to retrieve from Bloomberg (our main technical platform for retrieving data), we used the previous figure from the closest month with available data. However, the differences in those actual few cases were found to be only very minor. In cases where there were a lot of values missing from the data originally retrieved from Bloomberg, we have used S&P Capital IQ software to fill those gaps, which solved this issue in all the affected cases.

3.8.3 PE backed firms or not

We have looked at the respective prospectuses of each IPO company to validate if they are PE backed or not prior to the IPO date. Prospectuses always specify the ownership structure and provides details of the largest owners in terms of both share capital and voting rights, and this has been our starting-point. As we only focus on the ownership structure in connection with the IPO and not historically, evaluating the respective prospectus provided sufficient information for us to categorize the IPO firms. We have not applied any specific limitations on what fraction of share capital and voting rights the private equity firms need to possess in their respective portfolio companies for them to be considered PE backed. But we see that seven out of our eight PE backed IPO firms were of the buyout type, where all buyout firms in the sample held majority stakes in terms of both share capital and voting rights. The last PE company was of the VC type and had around 5% ownership in comparison to the seven others which had more than 50% ownership.

4. RESULTS

Starting off the result section of our paper, we did find that the Swedish equity market may be different from many other countries in terms of long-run performance evaluation. Our findings are not in line with the general results of the long-run underperformance of IPOs from different markets, e.g. in the case of Ritter (1991). However, some authors received results indicating of overperformance, such as Loughran et al. (1994). In their case study based on the Swedish equity market, Loughran et al. (1994) received an equally weighted average initial return of 27.2% between the years 1980-2011. The long-run performance evaluations are rather controversial areas of studies, with many different results highly dependent on methods, time horizons and equity market of choice. We have applied a number of methodologies of previous studies to be able to relate our results to their results.

Our thesis looks at the three-year long-run performance of IPOs but we still incorporate both 12-month and 24-month return portfolios to look for any patterns or similarities in our results. The 36-month return for all IPOs, figures 4.1 and 4.2, is more or less positive across all methods used. Also, by excluding the first month, our data becomes independent of the IPO pricing situation by the issuer and underwriter(s). The degree and correctness of information revelation by investors pre-IPO will affect the long-run performance, where deceptive information revelation correlates negatively with the long-run performance and vice versa, as discussed by Beneveniste & Spindt (1989). On one hand, the effect of negative price revelation leading to lower initial IPO prices and vice versa, will not affect our data as the first month is excluded. But on the other hand, we cannot link the long-run performance to whether the initial IPO prices were set close to the fair price or not.

Figure 4.1 Buy-and-Hold Abnormal Return (BHAR) results

1 year Abnormal Return	Value weighted		Equally weighted	
Benchmark	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
CAPM (Expected return)	19.91%	-11.03%	8.46%	-6.86%
2 year Abnormal Return	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
Benchmark				
CAPM (Expected return)	3.70%	-3.12%	7.64%	-5.83%
3 year Abnormal Return	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
Benchmark				
CAPM (Expected return)	8.58%	1.26%	12.87%	-0.64%

In the BHAR method, we find that the IPOs between 2004 and 2014 have outperformed their CAPM benchmark by 12.87% using equal weights and by 8.58% using value weights, after 36 consecutive months. As seen in figure 4.2, the only statistically significant variable at a 95% level is the the dummy variable "PE remained after 3y". Nevertheless, it is not viable to discuss this significant variable further because it only consist of one company that stayed for 36 month. Looking at the distribution, we see that 27 of our 53 IPOs received a positive BHAR after the 36 month period while 26 of them were negative.

Figure 4.2 BHAR linear regression results - All IPOs

Linear regression - All IPOs 53 observations	
BHAR	
Intercept	0.4956
P-value	0.497
Size (log)	-0.0235
P-value	0.772
BtM (log)	0.0211
P-value	0.702
PE backed (dummy)	-0.0857
P-value	0.622
PE remained after 3y (dummy)	-0.8472
P-value	0.004
Hot or Cold market (dummy)	-0.1460
P-value	0.551
Adjusted R^2	0.6145

Figure 4.3 Cumulative Abnormal Return (CAR) results

1 year Abnormal Return	Value weighted		Equally weighted	
Benchmark	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
CAPM (Expected return)	18.66%	-11.31%	8.37%	-7.12%
2 year Abnormal Return	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
Benchmark				
CAPM (Expected return)	4.42%	-5.04%	7.71%	-6.79%
3 year Abnormal Return	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
Benchmark				
CAPM (Expected return)	9.54%	-1.27%	12.66%	-2.23%

The results from the CAR method indicates results in line with what we found from the BHAR method previously. As seen in figure 4.3, our sample outperformed their respective CAPM benchmark by 12.66% and 9.54% when equally weighted and value weighted respectively, after 36 months. The result of overperformance hold in both weighting methods and for one as well as two years time frame, although the overperformance is more severe in three years of time.

In fact, the CAR indicated a positive return for each month from the first until the 36th month, with no underperformance. Starting with the equally weighted CARs in figure 7.2.1 (Appendix), the highest return was in the 36th month, and the lowest return, 2.29%, was in the first month. However, when looking at the value weighted returns, the corresponding results were completely different. The highest return, 22.18%, took place in the 11th month, and the lowest return, 1.48%, was in the 26th month.

Figure 4.4 CAR linear regression results - All IPOs

Linear regression - All IPOs 53 observations	
CAR	
Intercept	0.1332
P-value	0.452
Size (log)	0.0219
P-value	0.323
BtM (log)	0.0044
P-value	0.736
PE backed (dummy)	-0.0117
P-value	0.797
PE remained after 3y (dummy)	0.3132
P-value	0.000
Hot or Cold market (dummy)	-0.5257
P-value	0.401
Adjusted R^2	0.1602

4.1 Common results for BHAR and CAR

Figure 4.5 Monthly performance distribution of CAR

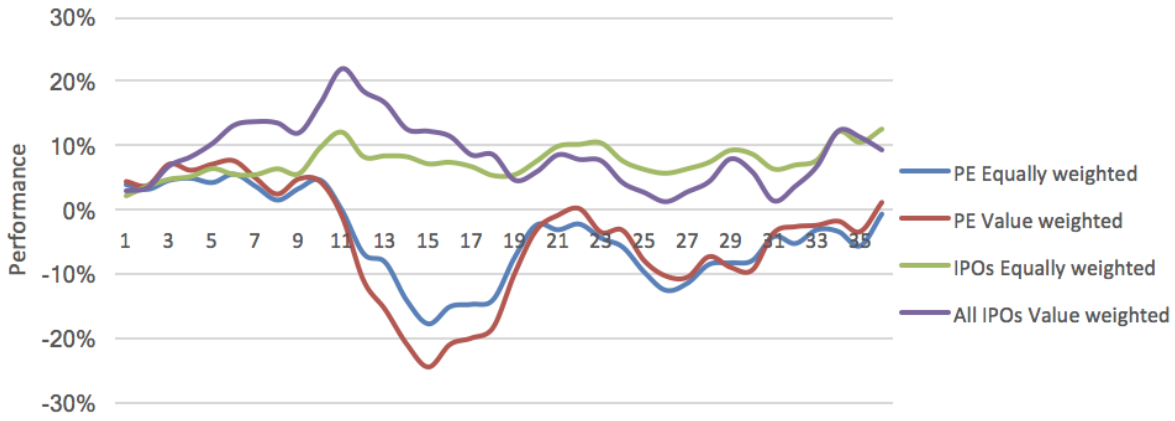
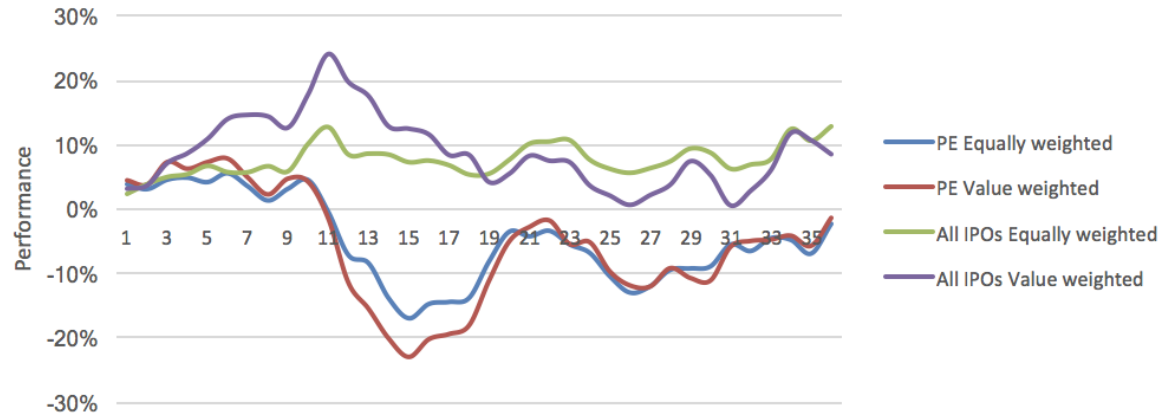


Figure 4.5 Monthly distribution of CAR



In figures 4.4 and 4.5, we can see that the performance is increasing in both BHAR and CAR for the 12, 24 and 36 calendar months for the equally weighted returns. However, there is a reduced performance from 12 to 24 months and then a slight increase in month 36 for both BHAR and CAR using value weights. The BHAR and CAR approaches are both following the same trends with the same weighting method, as seen in figures 4.4 and 4.5.

The fact that we receive positive abnormal returns in the long run is somewhat conflicting with the general study results but in line with the previous studies on Sweden amongst other Nordic countries and also on Asian countries. More specifically we find that IPOs are outperforming the CAPM benchmark over a period of 36 months. There are many types of benchmarks used in other studies; mainly composite indices or some type of risk adjusted benchmark e.g. similar companies to those in the sample.

Just as in previous studies, we have controlled for size (i.e. market cap) because smaller companies in terms of market capitalization tend to outperform larger companies and also inherit more risk. We also control for the book-to-market ratio, as this may set companies apart in their return profile. Other than that, we control for whether PE companies remain for all 36 consecutive months or exit in connection to the IPO or shortly post-IPO. A dependent variable used is "PE" where we determine whether each company in question is PE-backed or not. The time of the sampling and the sample itself can affect the results, but the sampling period have between 2004-2014 included both booms and busts with the financial crisis starting 2008. Therefore our results are not biased with respect to only in being in only a bull or bear market and we also try to control for this with our control variable "Hot or Cold market" that indicates whether the company was listed in a hot or cold period. On the other hand, regarding the small sample we have, it can cause the results to be less efficient than if we would have had a larger sample found in past literature, mostly amongst those that find underperformance.

Loughran, Ritter and Rydqvist (1994) argues that countries with large companies on their stock exchange are less prone to underperformance than those who inherit many young and growing firms. We only included companies from the OMX exchange, thereby including only the largest companies in Sweden and subject to the strongest regulations. The smaller firms exist on many other lists such as NGM equity, Aktietorget and First North that we excluded from our sample. This could be one of the reasons of why our findings did not indicate of any underperformance and it may be a result of that we excluded the small company lists that may have faced worse performance if we follow the arguments of Loughran, Ritter and Rydqvist (1994).

Using the event time approach instead of the calendar approach is according to Ahmad-Zaluki et al. (2007) one of the reasons for why we end up with overperformance in both weighting methods and all three portfolios. They argue that if we would have used calendar approach instead, there would be no signs of overperformance nor underperformance. The results from the study by Ahmad-Zaluki et al. (2007) also indicated overperformance when using event time CARs. After 36 months, they found the equally weighted CAR and value weighted CAR to amount to 32.63% and 0.75% respectively, using the Kuala Lumpur ("KL") composite index as their benchmark. They looked at Malaysian IPOs during ten years between 1990-2000, and also removed the first month of trading and received an overperformance of 4.67% compared to our 12.87%. But the interesting part is that their

results points to that overperformance are mostly found in the first month because when including the first month, they received 57% overperformance. We did not include the first month because of the noise from the early stages of the IPO. If Ahmad-Zaluki et al. (2007) and Kim et al. (1995) are correct regarding performance in the first month, we may have received a higher overperformance if including the first month. Another contributing factor of overperformance may come from the comprehensive IPO regulations and entry requirements which is present on major Malaysian and Swedish equity markets.

The discussion of whether BHAR or CAR yields the highest or lowest return, in our case, is that they are very similar. Both BHAR and CAR follow the same trend in 12, 24 and 36 month (figures 4.4 and 4.5). The 36 month equally weighted BHAR is slightly higher than the CAR but when value weighting, we see that CAR yields a bit higher returns. The value weighted results in both BHAR and CAR are lower than the equally weighted results. Our results are following the same pattern as Ahmad-Zaluki et al. (2007) who also used value weighted returns instead of equally weights and their overperformance disappeared whilst ours decreased but did not disappear. The reduced performance of value weights is also mentioned by Fama (1997) and our results are in line with this phenomenon.

In Vietnam, Ahmad-Zaluki et al. (2007), also received overperformance but only for their index benchmarks and when they used a similar company as benchmark their overperformance disappeared. The similar company benchmark works as a risk adjuster, making the abnormal returns positive if the company outperform the benchmark of same risk. Our approach instead incorporated CAPM model and the results in our risk adjusted abnormal returns are that we still get a overperformance. The study made in Vietnam is the one with the largest sample that points to overperformance which included 454 companies and is one of the most reliable overperformance studies mainly due to the sample size. Many of the studies pointing to underperformance have had thousands of companies in their sample where Ritter (1991) was one of the largest. Indicating that sample size could affect the results which is also mentioned by many authors.

Pseudo market timing explains that beliefs of future performances are wrong and why it turns into underperformance in the long run when prices fall down from the market highs. Therefore, firms that go public during cold markets are those who are the most keen of receiving financing, which will likely yield lower initial prices relative to the situation when issuing during hot markets. As our results do not indicate of any long-run underperformance,

the pseudo market timing explanation lacks evidence in our findings. However, this can also be explained by the fact that pseudo market timing only being visible in larger samples. The reason for pseudo market timing is that the IPOs take place when market conditions are good causing prices to fall in the long run. The asymmetric information is causing investors to become over optimistic, this is because investors are more uninformed and invest in the IPO, not knowing that the price is "too high" or that future is not as bright as the think. According to signaling theory the long-run underperformance is instead due to the short-term price increases compensating them for their risk which in the long run turns into underperformance. In our case, due to the strong regulations on the Nasdaq OMX Stockholm, it is most probably not an informational disadvantageous position from the investors perspective, as managers tend to have less power to affect investor beliefs. Generally, less comprehensive regulations and entry requirements into stock exchanges tend to enable worse-performing companies to enter, and may contribute to long-run underperformance.

Moreover, the prospect theory concludes that a rational investor accept underperformance only to have a chance of gaining very high returns in an IPO. In our case the investor instead receives overperformance if investing in all IPOs and still has the chance for very high returns, which is a sign to buy into IPOs, at least on the Nasdaq OMX Stockholm.

4.2 PE backed IPO Performance

The entry barriers to Nasdaq OMX Stockholm are among the main arguments of Westerholm (2006) for why we get higher returns on the Swedish and other Nordic equity markets versus equity markets in other geographical regions. The high IPO returns in Asia may have other explanations as their entry barriers to their major stock exchanges are not as strict, such as in South Korea. As shown by the study of Kim et al. (1995), major South Korean stock exchanges are more experienced in conducting IPOs relative to other countries. We did not categorize the IPOs by industry origin when evaluation long-run IPO performance, but we could later on see that our PE sample was fragmented in terms of industry origins. However, the PE sample did not show any significantly high or low abnormal returns that was derived from a specific industry or year. This might be due to that our PE sample netted only 8 IPO firms after our screening process. Hence, this sample may not be large enough to find any industry or time specific patterns or explanations.

We find that our PE backed companies performed worse than the total IPO sample. The PE sample contained only one VC backed firm during the total of 36 months. We were wondering if the result of overperformance of all IPOs, or at least the PE backed ones, could be because many of the companies are in a specific industry. After finding that PE backed firms are fragmented into several industries where the largest industry (consisting of 3 companies) is manufacturing that includes IT components, air vents and screws. This may indicate that the overperformance received was unaffected by any industry specific bias.

Many of the studies made on IPOs of PE backed companies find that they are not underperforming as much as the non PE backed firms. The logical reasoning in Minardi et al. (2012) is that PE firms bring professionalism into the firms they invest in and therefore inherit less underperformance which is not found in our study. Our results on the other hand show that the PE backed IPOs are doing worse than the total IPOs performance for all methods and measures used. This may actually not be that surprising. If PE backed companies bring more professionalism to companies and manage to time market highs better than non-PE backed companies, then the underperformance will be larger for the PE backed company. This is because if they time the market, the price will be higher than the fundamental value in the short-run and hence the price will have a larger decrease in the long-run when prices adjust back to the fundamentally lower value. This was one of the explanations of our result argued by Bergström et al. (2006), another point they make is that PE backed companies often leave a few months after the IPO and therefore the PE firm will maximize the profits leading to a higher return in the first year or two and then a stronger underperformance for the third year. Our results are not in line with this argument, they show that PE backed firms are doing worse the first years after the IPO and then better for each consecutive year. Our results are in line with most of the research in the part that they have underperformance even if in our case they are actually doing worse than the non-PE backed. Another reason for why PE backed IPOs in our case are doing worse than all IPOs is that when PE companies enter the target company the entrepreneur have to give up shares and control This may cause the company to be less efficient because the entrepreneur may have been the reason for the success.

Moreover, a concluding notable remark is that even if past studies compare PE backed IPOs with non-PE backed, we rather compare the total IPO sample with PE backed, where the PE backed sample is also included in the total IPO sample.

5. CONCLUSION

We have applied a number of commonly accepted empirical methods to examine whether total IPOs and PE backed IPOs separately receive positive or negative long-run performance on the Swedish major equity markets between 2004-2014. All of our regression variables except “PE remained after 3y” were insignificant. Only one out of our eight PE backed firms maintained its stake in its portfolio company after three years, and this was a VC firm. Small companies yield lower returns than larger companies on average, and tend to be more affected by financial crisis, as seen historically. By including only the major stock exchange on the Swedish equity market, our results abnormal returns may have be higher relative to the case if including the remaining stock exchanges that include the smaller firms.

The long-run overperformance that we received on Nasdaq OMX Stockholm over the CAPM benchmark has ranges between 8.58-12.87% using equally weights and value weights through both the BHAR and CAR approaches. Overperformance has been found in past studies in some countries including Sweden, some other Nordic countries and a few Asian countries. A part of this overperformance effect is said to come from stable countries with high regulatory requirements of IPOs on stock exchanges with large companies that reduces the risk of investing in IPOs. This fit quite well with our result having looked at OMX Stockholm that is the most regulated exchange in Sweden and which consists of the largest companies. The CAPM model is risk adjusting our returns such that the overperformance in our case is considering that every company have its own risk profile. For this reason we believe that risk-adjusted benchmark has its advantages over a composite index benchmark that does not consider the company risk.

Neither the total of our IPOs nor the PE backed IPOs have been coming from any specific industry that could have affected IPO performance. Our results are based on event time and Ahmad-Zaluki et al. (2007) argues that calendar time approach would decrease the overperformance. They also stated that value weighted returns decrease underperformance and in our case value weights compared to equally weights decreased underperformance in PE backed companies using CAR. In all IPOs and also PE backed using BHAR, value weights have decreased our overperformance. The fact that we removed the first month of trading for the IPOs may have removed or reduced the underperformance effect from the underpricing phenomenon discussed in Kim et al. (1995).

PE backed companies have, according to our results, received slight underperformance, in all cases except for the value weighted BHAR, which measured an overperformance of 1.26%. The PE backed companies are anyhow underperforming the total IPOs, which can be the case when PE managers can time the market. Also they tend to exit the portfolio company almost immediately post-IPO, making them focus on short-run performance instead of the long-run performance, leaving us with underperformance and less return than total IPOs.

The skewed return distribution of IPOs indicates that there are both large losses and gains to be made. In our sample the return has on average been higher than the expected return for the companies. This would make investors incentivized to engage in IPOs because they will earn a higher return than what they are expecting from their initial prices. Normally investors will accept a certain underperformance of an IPO to be able to gain from the sometimes very high return. But in our case they do not have to sacrifice the underperformance for the possibility of increased returns, they will instead gain from taking that extra risk. The investor should on the other hand only invest in PE backed IPOs if they feel that the underperformance they face is manageable for a chance to gain the possible higher return.

6. FURTHER RESEARCH AND LIMITATIONS

There are many more methods that can be used to study the effect of long-run performance. We used some of the approaches as of the previous studies. In addition to the event time study that we have conducted, one can also include calendar time. The benchmark is probably the most widely discussed part of the methodology as methods depending on the study. The most common benchmarks that others implement are Fama-French three factor model, indices or to use a similar company in terms of size, industry and BtM-ratio to benchmark against. Other have used liquidity and leverage ratios as important factors to control for when comparing. There are other factors other than PE that one can look at regarding long-run performance, such as if the performance on the first day affect the long run performance.

Further, to make a more comprehensive analysis of the PE-backed IPOs long-run performance, one could compare them to non-PE backed IPOs rather than comparing against all IPOs together, as in our case. Some of the studies regarding PE backed firms are only focused on the VC type but we are still comparing our results to theirs even if we are including LBO and VC in our PE companies. The VC and LBO type of PE companies can have different effects but we chose to include them both in PE and also to compare against studies only looking at VC backed firms as the studies on PE backed firms are limited.

In this paper, we have used the term "Private Equity" to refer to and account for for all types of players in that industry; growth PE, buyout PE, venture capitalists, business angels etc. Initially, we intended to focus on buyout PE exclusively, but due to the limited number of private equity issued IPOs in our sample, we could not use such a narrow restriction in order to provide findings with enough observations. We are not compounding our BHAR returns even if that is normally done and what differs from the CAR approach. This would on the other hand not have a large effect on our results.

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8. APPENDIX

Appendix 8.1

Figure 8.1.1 Regression results OLS, 36 month BHAR return of all IPOs

```
Linear regression                               Number of obs     =         53
                                                F(4, 47)          =          .
                                                Prob > F          =          .
                                                R-squared         =     0.0460
                                                Root MSE          =     .61447
```

bhar	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsize	-.0234856	.080456	-0.29	0.772	-.1853422	.138371
lnbtm	.0210549	.054648	0.39	0.702	-.0888826	.1309925
pe	-.0856831	.172559	-0.50	0.622	-.432827	.2614607
pekvar	-.8471785	.2802339	-3.02	0.004	-1.410936	-.2834206
hotcold	-.1459912	.242793	-0.60	0.551	-.6344277	.3424453
_cons	.495626	.7239068	0.68	0.497	-.9606867	1.951939

Figure 8.1.2 Return distribution, BHAR 36 month return of all IPOs

BHAR

Percentiles	Smallest		
1% -.7506527	-.7506527		
5% -.6798539	-.6835471		
10% -.6239495	-.6798539	Obs	53
25% -.3752164	-.6789632	Sum of Wgt.	53
50% .1362556		Mean	.0966862
	Largest	Std. Dev.	.5980923
75% .5420456	.9084392		
90% .7006355	1.124614	Variance	.3577144
95% 1.124614	1.525261	Skewness	.5557549
99% 1.753345	1.753345	Kurtosis	2.785786

Figure 8.1.3 Regression results OLS, 36 month CAR return of all IPOs

Linear regression

Number of obs	=	53	
F(4, 47)	=	.	
Prob > F	=	.	
R-squared	=	0.1196	
Root MSE	=	.16017	

car	Coef.	Robust Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsize	.0217865	.0218121	1.00	0.323	-.0220937	.0656667
lnbtm	.0043704	.0129066	0.34	0.736	-.0215943	.030335
pe	-.011711	.0453193	-0.26	0.797	-.1028816	.0794597
pekvar	.3132237	.0714775	4.38	0.000	.1694295	.4570179
hotcold	-.0525666	.0620699	-0.85	0.401	-.1774351	.072302
_cons	.1332257	.175509	0.76	0.452	-.2198529	.4863042

Figure 8.1.4 Return distribution, CAR 36 month returns of all IPOs

CAR

	Percentiles	Smallest		
1%	-.188547	-.188547		
5%	.0365753	-.024406		
10%	.0602533	.0365753	Obs	53
25%	.1361019	.0469352	Sum of Wgt.	53
50%	.2305012		Mean	.2452038
		Largest	Std. Dev.	.1622927
75%	.3444655	.5022047		
90%	.4315886	.5352754	Variance	.0263389
95%	.5352754	.5815827	Skewness	.1903495
99%	.6518925	.6518925	Kurtosis	3.113751

Appendix 8.2

Figure 8.2.1 Monthly performance distribution during 36 months of all IPOs and PE backed IPOs

	CAR - Value weighted		CAR - Equally weighted		BHAR - Value weighted		BHAR - Equally weighted	
Months	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs	All IPOs	PE backed IPOs
1	3.16%	4.56%	2.29%	3.98%	3.16%	4.56%	2.29%	3.98%
2	3.68%	3.95%	3.79%	3.24%	3.70%	3.92%	3.82%	3.21%
3	7.05%	7.30%	4.87%	4.67%	7.19%	7.40%	4.94%	4.69%
4	8.48%	6.33%	5.29%	4.97%	8.73%	6.36%	5.38%	5.00%
5	10.55%	7.30%	6.51%	4.31%	10.98%	7.40%	6.67%	4.31%
6	13.38%	7.80%	5.60%	5.63%	14.11%	7.93%	5.70%	5.69%
7	13.94%	5.08%	5.59%	3.70%	14.75%	4.99%	5.69%	3.65%
8	13.73%	2.59%	6.48%	1.57%	14.52%	2.38%	6.63%	1.43%
9	12.20%	4.98%	5.73%	3.38%	12.76%	4.82%	5.84%	3.28%
10	16.83%	4.50%	9.82%	4.69%	17.98%	4.32%	10.16%	4.63%
11	22.18%	-0.95%	12.18%	-0.08%	24.29%	-1.36%	12.76%	-0.36%
12	18.66%	-11.03%	8.37%	-6.86%	19.91%	-11.31%	8.46%	-7.12%
13	16.82%	-15.60%	8.50%	-8.23%	17.71%	-15.36%	8.60%	-8.39%
14	12.77%	-21.04%	8.36%	-14.22%	12.95%	-19.96%	8.46%	-13.88%
15	12.45%	-24.61%	7.26%	-17.86%	12.58%	-22.82%	7.26%	-17.02%
16	11.65%	-21.06%	7.50%	-15.17%	11.68%	-20.08%	7.51%	-14.78%
17	8.76%	-20.06%	6.82%	-14.80%	8.45%	-19.28%	6.78%	-14.47%
18	8.78%	-18.39%	5.45%	-14.06%	8.47%	-17.93%	5.32%	-13.84%
19	4.83%	-9.87%	5.58%	-7.38%	4.19%	-10.94%	5.46%	-8.08%
20	6.10%	-3.08%	7.65%	-2.36%	5.51%	-4.90%	7.65%	-3.46%
21	8.76%	-0.74%	9.99%	-3.10%	8.32%	-2.67%	10.16%	-4.18%
22	8.05%	0.28%	10.30%	-2.21%	7.55%	-1.68%	10.50%	-3.33%
23	7.84%	-3.42%	10.50%	-4.41%	7.33%	-5.32%	10.72%	-5.45%
24	4.42%	-3.13%	7.71%	-5.83%	3.66%	-5.04%	7.64%	-6.79%
25	2.90%	-7.91%	6.39%	-9.76%	2.08%	-9.57%	6.21%	-10.46%
26	1.48%	-10.31%	5.80%	-12.60%	0.63%	-11.75%	5.59%	-13.00%
27	3.00%	-10.48%	6.49%	-11.48%	2.16%	-11.90%	6.32%	-12.02%
28	4.60%	-7.26%	7.50%	-8.54%	3.79%	-9.06%	7.39%	-9.44%
29	8.14%	-8.94%	9.37%	-8.29%	7.47%	-10.59%	9.40%	-9.21%
30	6.13%	-9.37%	8.78%	-7.93%	5.31%	-10.97%	8.75%	-8.89%
31	1.60%	-3.49%	6.45%	-4.18%	0.54%	-5.74%	6.22%	-5.47%
32	3.90%	-2.54%	7.08%	-5.25%	2.85%	-4.84%	6.89%	-6.48%
33	7.01%	-2.32%	7.86%	-3.10%	6.05%	-4.63%	7.72%	-4.47%
34	12.53%	-1.69%	12.25%	-3.39%	11.90%	-4.03%	12.45%	-4.75%
35	11.51%	-3.32%	10.62%	-5.63%	10.77%	-5.60%	10.62%	-6.88%
36	9.54%	1.27%	12.66%	-0.64%	8.58%	-1.26%	12.87%	-2.23%

Figure 8.2.2 53 IPOs by name, market cap, PE backed or not and IPO date

IPO Company	Market capitalization (SEKM)	PE backed	IPO date
UNIFLEX AB	197.374	No	2005-01-31
GUNNEBO INDUSTRIER	780.6101	No	2005-07-29
HEMTEX AB	2143.3312	No	2005-10-31
INDUTRADE AB	3200	Yes	2005-10-31
OREXO AB	1619.2206	Yes	2005-11-30
TRADEDOUBLER	3800.7509	No	2005-11-30
ICA GRUPPEN AB	7293.579	No	2005-12-30
KAPPAHL AB	4652.4801	No	2006-02-28
CATENA AB	982.9825	No	2006-04-28
DIOS FASTIGHETER AB	744.3347	No	2006-05-31
HUSQVARNA AB	23021.8527	No	2006-06-30
MELKER SCHORLING AB	11557.3651	No	2006-09-29
SWEDISH ORPHAN BIOVITRUM AB	5024.8382	No	2006-09-29
LINDAB INTERNATIONAL AB	10251.6912	No	2006-11-30
REZIDOR HOTEL GROUP AB	8850.1179	No	2006-11-30
ALLENEX AB	518.959	No	2006-12-29
NEDERMAN HOLDING AB	1054.377	Yes	2007-06-29
Vostok New Ventured Ltd	3290.4944	No	2007-07-31
HMS NETWORKS AB	734.7262	Yes	2007-10-31
SYSTEMAIR AB	3640	No	2007-10-31
DUNI AB	2326.4505	Yes	2007-11-30
EASTNINE AB	3379.9999	No	2007-11-30
HEXPOL AB	1393.9774	No	2008-06-30
GHP Speciality Care AB	641.6794	No	2008-10-31
Loomis AB	5019.5625	No	2008-12-30
ARISE AB	1508.6206	No	2010-03-31
BYGGMAX GROUP AB	3006.4815	Yes	2010-06-30
MQ HOLDING AB	1021.1328	No	2010-06-30
Etrion Corp	832.317	No	2010-11-30
QLRO AB	2122.9473	No	2010-12-30
KAROLINSKA DEVELOPMENT-B	1800.5113	No	2011-04-29
BULTEN AB	1028.8657	Yes	2011-05-31
Transmode AB	1367.2354	No	2011-05-31
Moberg Pharma AB	216.9886	No	2011-05-31
Dedicare AB	200.2682	No	2011-05-31
Concentric AB	1750.9536	No	2011-06-30
Boule Diagnostics AB	225.4701	No	2011-06-30
SEMAFO Inc.	14160.4576	No	2011-10-31
Cavotec SA	999.561	No	2011-10-31
PLATZER FASTIGHETER HOLD-B	2585.1808	No	2013-11-29
BUFAB AB	2115.1347	No	2014-02-28
HEMFOSA FASTIGHETER AB	7032.0507	No	2014-03-31
RECIPHARM AB-B SHS	3644.5097	No	2014-04-30
BACTIGUARD HOLDING AB	815.9082	No	2014-06-30
BESQAB AB	1284.3643	No	2014-06-30
SCANDI STANDARD AB	2762.8009	No	2014-06-30
NGEx Resources Inc.	2592.0094	No	2014-06-30
INWIDO AB	3536.0193	No	2014-09-30
GRANGES AB	3597.6186	No	2014-10-31
LIFCO AB-B SHS	12218.4183	No	2014-11-28
THULE GROUP AB/THE	8950	No	2014-11-28
NP3 FASTIGHETER AB	1865.3814	No	2014-12-30
Lundin Gold Inc.	2681.1711	No	2014-12-30