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Retail and Institutional Allocation in Swedish IPOs

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Abstract

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Purpose:

The purpose of this paper is to test if Swedish retail investors are discriminated in the IPO allocation decision. Through interviews with investment banks we will also get an inside view on the decision process. An effect rather than a purpose is also to add information about the Swedish IPO process to the uninformed investor.

Methodology:

In our research paper we use a quantitative regression analysis suggested by Hanley and Wilhelm (1995) to find allocation and return patterns in the Swedish IPO market. We also add an inside view on the allocation decision to our study by conducting qualitative interviews with two leading investment banks.

Theoretical evidence:

We have collected theoretical evidence about the IPO process in general and the allocation decision specifically by reviewing numerous academic articles.

Empirical findings:

Our empirical findings from our regression analysis show that institutional investors are not favored in the Swedish market by more allocation in “hot issues”. However, institutions are found to be favored in the long run because of the major allocational advantage of the institutions combined with the, on average, short run price appreciation of IPOs. The interviews reveal what governs the allocation decision making process and inside information about the IPO process in general.

Conclusion:

Our findings that retail investors are favored when underpricing is higher, contradict the evidence from Hanley and Wilhelm (1995) and Aggarwal et al. (2002), who are suggesting that institutions are favored in more underpriced IPOs.

Thanks:

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1. Introduction

In this section we will discuss the background of our topic, our problem, and the purpose of our study. Furthermore, the limitations to the study are presented.

Information drives the stock market and the informed investor is more likely to make money. Some private investors are at a disadvantage when it comes to the stock market and often sell or buy a stock at the wrong time pending on when they got the information and how they interpret it. The return of the investment is tied to the value of the stock/company at a certain point in time.

An event we find interesting on the stock market, is when a private corporation is introduced on the stock exchange or what is called an Initial Public Offering (IPO). This is a point in time when the company offer ownership to retail and institutional investors, and will be traded publicly in the market. In order for the IPO to be successful, enough investors have to invest in the offering, i.e. the offering has to be fully subscribed. The offering is divided between institutional and private investors. Information is very important in the IPO process, and the informed investor is more likely to make money on their investment. Institutional investors are often perceived to be more informed. Therefore, some private investors are at a disadvantage when it comes to the investment decision. Since there are no set rules governing how to allocate the shares, we are particularly interested in the allocation of the stocks in the offering.

In this paper, we will look at how stocks have been allocated in historic Swedish IPOs, and also conduct interviews with investment banks in order to understand how they reason when allocating the shares. By combining these two methods we will add valuable information to investors about the IPO process.

1.1 Background

The introduction to the stock exchange is a crucial stage in the progress of the lifecycle in a company as they will try to attract investors that can provide future funding and ownership (Choe, Masulis and Nanda (1993)). There have been several previous studies concerning different aspects of IPOs. A common finding by Loughran, Ritter and Rydqvist (1994), show that most of the initial return after an IPO is positive due to underpricing¹. They reason that the company is usually offered at a discount due to information asymmetry and uncertainty in the market about the value of the company. It is in other words a way to attract investors to the company. In order to find the investors and receive a fair value for the IPO, the company often turns to an investment bank² that will help them underwrite the deal.

There has been 119 IPOs in the Swedish market from 1997 to 2006³ and they have had various outcomes to the different parties involved. What probably makes them so interesting is the uncertainty about the outcome and the immense values associated with an IPO. The investors in an IPO consist of retail⁴ and institutional investors⁵. They receive allocation at the discretion of the underwriter. Since the allocation decision is discretionary and not

¹ See separate discussion for underpricing in section 2.2

² Investment bank may also be labeled under writer in our paper.

³ OMX database.

⁴ Retail investor is a private investor

⁵ Institutional investors are professional often large investors.

governed by rules the allotment between retail and institution vary between IPOs. Previous studies in the US market include Aggarwal *et al.* (2002) and Hanley and Wilhelm (1995). They show evidence of favorable allocations towards institutional investors when underpricing is higher. To our knowledge there has not been a prior study of this phenomenon in the Swedish market⁶.

1.2 Problem Discussion

The IPO process in general has been researched in many papers in an attempt to add information to a rather closed event. The subjects of underpricing, why firms go public and the underwriting process are popular research areas and there are numerous articles on these subjects. As of late, research papers have become more specific, an example of this is the allocation process between private and institutional investors. Previous studies on the allocation phenomena have been concentrated to the US market and some articles have been written about the European market (Jenkinson and Jones (2004)).

Hanley and Wilhelm (1995) finds that in the US market, the level of underpricing determines the allocation in the offering i.e. if an offer is more underpriced a larger share of stocks will be allocated to institutional investors, whereas if an IPO is less underpriced institutions will receive less shares. This means that institutions will be favored in the hot IPOs and receive greater returns overall, this finding is also supported by Aggarwal *et al* (2002). We have not found any previous studies concerning the allocation among Swedish IPOs and we want to investigate if this underpricing/allocation problem also holds true in the Swedish market by testing data we collected from 2001 to 2006. In order to get comparable results we will use similar methods as Aggarwal *et al* (2002) and Hanley and Wilhelm (1995). To investigate how the allocation is determined we will also add qualitative interviews with two participating investment banks to see how they reason when allocating shares.

In our study we want to test if discrimination occurs in the Swedish IPO allocation process.

1.3 Purpose

The purpose of our study is threefold. First, by testing our hypothesis; no discrimination in the Swedish IPO process, we will look for evidence if discriminatory allocation practices exist against retail investors in the Swedish market. Second, we want to add information about how allocation decisions are made through qualitative interviews to let the reader create an opinion why issues are allocated in a certain manner. Third, in order for the reader to understand the allocation process we have added substantial theoretical information about the entire process. Thus, we will provide information to the uninformed investor about the allocation process specifically and the entire process in general.

1.4 Delimitation and Assumptions

In order to get a more specific view in our research paper, we limit our test to a quantitative analysis of the allocation decision between retail and institutional investors and returns associated with this allotment. We have opted to limit our study using historical information from the Swedish market. Only one, very limited prior study, has been conducted on the

⁶ Ljungqvist and Wilhelm (2002) has written an article about international allocation that mention Swedish IPOs but they do not address the question of allocation and return in the Swedish market.

Swedish market Ljungqvist and Wilhelm (2002). Also, in their study they only display the allocation between institutions and retail and do not compare this allocation with returns in the aftermarket. Since the decision is discretionary for the underwriter we have also chosen to add qualitative interviews in order to get insight how the underwriters reason when allocating shares between retail and institutional investors. In order to keep our research specific we do not discuss the economics behind the valuation process of the company in detail; we simply describe the process used to estimate the initial offer price.

Throughout our paper we will use the following assumptions as suggested by previous research:

- Institutional investors are informed investors
- Retail investors are uninformed investors

“Per definition there is a distinction between retail and institutional investors. The scale of institutions leads us to believe that they are better informed and more important clients” Ritter and Welch (2002).

“It is often claimed that institutional investors are well-informed relative to retail investors” Hanley and Wilhelm (1995).

2. Theory

In this section we will add information to the reader by describing different parts of the IPO process and assess a variety of theories necessary to understand our research and results.

2.1 Theoretical Background

The Theoretical Background section is something we have decided to incorporate in the paper to briefly discuss some underlying parts of the IPO process. Most of what is discussed here will not be used in our study but we felt it hard to leave out since it sets the mood for the rest of the Theory chapter. If you are familiar with general IPO theory or for example why firms go public, when it is appropriate to do so, what IPO methods are used by the banks, and how an IPO is valued, feel free to skip ahead to section 2.2.

2.1.1 Reasons for Going Public

According to Brau and Fawcett (2006), there are four main academic theories that support the decision to go public. First, there is the cost of capital theory (Modigliani and Miller (1963)) and (Scott (1976)), which states that firms go public when external equity will result in lower cost of capital, maximizing the value of the firm. Supporting the cost of capital theory, Mayers and Majluf (1984) present the pecking order theory, where different sources of capital will have different costs. Second, Zingales (1995) and Mello and Parsons (2000) argue that the decision to go public is a way for insiders to cash out. This theory is also supported by Ang and Brau (2003) which state that insiders sell shares in the IPO process for personal benefit. Third, IPOs can also serve to prevent hostile takeovers by increasing the ownership base (Zingales (1995)). Fourth, an IPO can be a strategic move for a firm. Maksimovic and Pichler (2001) argue that an IPO can increase the reputation and publicity of a firm. Bradley, Jordan and Ritter (2003) argue that analyst coverage increases after an IPO and that recommendations are biased to be positive.

Brau and Fawcett (2006) find that the strongest reason for going public is to create public shares to use in acquisitions. The second biggest reason is to establish a market value of the firm. Their findings in the survey are consistent with the tested notion that 141 of the firms going public were acquirers whereas only 18 were target firms. The theory motivated by lower cost of capital only ranked fourth in the test, followed lastly by finding new sources of capital due to constraints on current funding.

2.1.2 IPO Timing

Past research show that IPOs often come in waves (Ibbotson and Jaffe (1975) and Ritter (1980)). Three theories of the timing decision is presented and tested by Brau and Fawcett (2006). The first theory argues that the firm takes advantage of a bull market. The empirical measures of a bull market includes current overall market conditions (Lucas and McDonald (1990)), industry conditions (Lowery (2002)), and also historical market conditions (Ritter and Welch (2002)). Second, Lowery and Schwert (2002) argue that the decision to go public at a certain point in time is influenced by return of other current IPOs. Third, firms reach a point in their lifecycle where they need external equity for further growth (Choe, Masulis and Nanda (1993)). Findings in the CFO survey show that the most important influence on the timing of an IPO is the current overall market conditions. Other factors were not considered as important.

2.1.3 Signaling in IPOs

Another aspect to take into account when looking at IPO research is signaling. By going public a firm will send a powerful signal to the market. Numerous articles argue the positive signaling effect of having a reputable firm to underwrite the deal (Booth and Chua (1986), Carter, Dark and Singh (1998)). Having a prestigious firm involved in any part of the process serve as a strong certification that the firm going public is a good firm (Michealy and Shaw (1995), Barry et al. (1990)). Other positive signals include that only high-quality firms can afford to disperse wealth by underpricing (Welch (1989) and Chemmanur (1993)). Furthermore, Brau, Lambson and McQueen's (2005) propose that when insiders commit to holding their shares for a long time in the after market they send a strong signal to the market. Teoh, Welch and Wong (1998) suggest that a history of profitability signal future strong performance. The survey by Brau and Fawcett (2006) show that the best signal according to CFOs is historically strong earnings and the worst signal to send is when insiders sell their shares in the IPO.

2.1.4 IPO Methods

There are different methods across international markets that affect underwriter discretion in the IPO process (Jagganathan and Sherman (2006)). According to Sherman and Titman (2002), there are generally three main methods for underwriters to attract investors to an IPO. These methods are **open order**, **auction** and **book building**.

In the open order process, any investor is free to sign up for an IPO. There is no information exchange and no limit constraints associated with their bids. Also, small orders are often favored over large orders and orders can sometimes be allocated pro rata (Sherman and Titman (2002)).

An auction IPO process will give the investors an opportunity to participate in the offering and place their bids according to an auction. According to Sherman (2005), auctions are efficient since investors do not receive excess returns. However, auctions appear to be riskier than book building, since in book building underwriters promote the IPO to various investors that have an incentive to consider the offer. Even though an auction could also have the optimal number of bidders, there is a greater risk that the issue will be undersubscribed.

Furthermore, Jaggannathan and Sherman (2006) suggest that “[t]he free rider problem and the winner’s curse hamper price discovery and discourage investors from participating in auctions”. They believe this is the reason for the imprecise pricing and poor aftermarket performance of auctioned IPOs. The free rider problem and winner’s curse theory is explained later in section 2.3.2.

The book building theory was first presented by Benveniste and Spindt (1989). The process can be divided into three steps. First, the investment bank invites potential investors. Second, investors evaluate the issue and indicate their demand to the underwriter. Finally, the underwriter prices the issue and allocates shares among the investors (Sherman and Titman (2002)).

It is well documented that the US method of book building has become increasingly popular in the major markets in the world. Book building at the underwriter’s discretion, may have significant effect on the way shares are allocated within an IPO and consequently also the

level of underpricing. As suggested by Ljungqvist and Wilhelm (2002) “IPO allocation policies favor institutional investors [i]n the US”. Also, Benveniste and Spindt (1989) argue that if institutions would not be rewarded with high allocations or deliberate underpricing in the IPO, they would have little incentive to bid aggressively since it would only drive up the offer price. Sherman (2005) suggests that book building can be viewed as a way to ensure entry of participants.

The article by Jaggannathan and Sherman (2006), propose an alternative hybrid system for the Swedish market with book building for institutions and open order for retail investors.

2.1.5 Underwriter Selection and Role

According to Cornelli and Goldreich (2002), the underwriter’s role in the IPO process is divided into four areas; conduct preliminary analysis, choose the offer price, allocate the shares and stabilize the aftermarket price. Underwriters appear to be very influential in the entire process. As Ritter and Welch (2002) writes, underwriters have price and allocation discretion and determine who gets shares, how many and at what price. Krigman et al. (2001) and Brau and Fawcett (2006) use the same survey on CFOs’ opinions. In their articles the CFOs are asked to rank the criteria for selecting underwriter on a five point scale. The results show consistent evidence that overall reputation is the most important criteria, followed in order by quality of research and industry expertise.

2.1.6 Valuation Models for an IPO

Since the company has never been traded on an official exchange, it may be hard for future investors in the IPO to determine a fair value of the company’s stocks. A step in the price discovery process is when the underwriter values the company using different parameters and input to find an estimated market value. For clarity the valuation process is divided into three steps:

1. *Historical analysis of the company performance.* According to Copeland (2000), the first step to analyze a company is to look at their historical income statement and balance sheet. Furthermore, the most important aspects to look at are growth and value creation. Copeland (2000) also suggests that the most central value driver of the company is Return on Invested Capital (ROIC).
2. *Discounted Cash Flow models.* These models are used to forecast free cash flows to get an estimated value of the company (Copeland, 2000).
3. *Comparables* The comparables valuation process uses similar listed companies’ multiples to find an estimated market value of the company going public. The most common multiples to use for this valuation are Price/Earnings (P/E) and Price/Sales (P/S) (Damodaran (1994)).

The three step procedure is an initial step in the pricing process. The underwriter uses the input when they approach potential institutional investors. The next phase in the price discovery process will be discussed later in section 3.5.

2.2 The Pricing Decision

There are different types of information incorporated in the offering price of an IPO. This information span contains both private and public information. The proposed price of an IPO in the prospectus is either a set price or set within a price range. The preliminary price range should give a fair indication of where the underwriter expects to price the offering.

According to Lowry and Schwert (2003), prior literature has used the midpoint of the range as an estimate of the expected price. This assumption asserts that "underwriters incorporate all available information in setting the preliminary price range" (Ibid). An interesting view is presented by Benveniste and Spindt (1989). They argue that informed investors provide underwriters with private information about the value of the firm before the final price is set. Underwriters then reward the informed investors by only incorporating parts of that information into the offer price so that they can earn high returns on the first trading day of the stock. Supporting these theories, Hanley (1993) and Cornelli and Goldreich (2001) argue that only parts of private information contributed in the process is incorporated into the offer price. Similarly, Ljungqvist and Wilhelm (2002) show that institutions which reveal private positive information in the IPO process are rewarded through higher allocation within the IPO.

2.3 Underpricing

In order to attract investors, it is widely known that the offer price is usually set at a discount to the market (Chowdhry and Sherman (1996); Lee, Taylor and Walter (1999); Ljungqvist and Wilhelm (2002)). Since the companies' stocks have never been traded on a public exchange, there are no historical price levels for the market to look at. There are several theories which attempt to explain the phenomena of underpricing; these theories will be discussed in further detail below. For clarity; they are divided into sub-groups based on importance suggested by past literature dealing with underpricing.

2.3.1 Asymmetric Information

Asymmetric information in the IPO process leads to underpricing. Baron and Holmström (1980) and Baron (1982) argue that information asymmetry exists between the firm and the underwriter, resulting in the underwriter taking advantage of their market expertise to underprice the issue in order to minimize marketing effort and attract investors. Asymmetric information between the issuers and potential investors also exists. Beatty and Ritter (1986) argue that investors demand an IPO price lower than the future market price due to uncertainty about the investment. Benveniste and Spindt (1989) argue that underpricing is a way to reward institutional investors who lessen the information asymmetry by revealing more accurate information during the IPO process. Underpricing also occurs because of asymmetric information between the informed and uninformed investor. In his paper, Rock (1986) argues that the risk associated with the IPO will lead to an underpricing demand by the uninformed investor.

2.3.2 Marketing Function

Underpricing may serve as a marketing function. Habib and Ljungqvist (2001) argue that underpricing is a marketing function in itself, which will lead to lower cost in other marketing efforts. Supporting this notion, Demers and Lewellen (2003), show that underpricing will give the stock much attention on the opening day, creating a buzz in the market. Similarly, Boehmer and Fische (2001) demonstrate that the trading volume of the stock in the aftermarket will increase with underpricing.

2.3.3 Broaden the Ownership Base

Underpricing will increase the ownership base of the IPO. If the initial price is set at a lower level, more investors will be attracted to the IPO leading to oversubscription. Depending on how the allocation process is determined in the case of oversubscription, the ownership base in the IPO may be diluted. According to Hill (2006) broadening is beneficial since it reduces required rate of return among investors and promotes liquidity. However, Brennan and Franks (1997) argue that a wide dispersion of owners is deliberately targeted by managers looking to entrench themselves. On the other hand, Stoughton and Zechner (1998) argue that underpricing allows for creation of block holders, which will increase monitoring. Brennan and Franks' theory suggests that underpricing is used to get a wide ownership spread in the aftermarket to discourage hostile takeover, suggesting that buying a large block of shares in the aftermarket will be more costly. Booth and Chua (1996) suggest that underpricing is used to encourage oversubscription which would in turn increase the ownership dispersion.

2.3.4 Prospect Theory

An interesting perspective on prospect theory (Kahneman and Tversky (1979)), is presented by Loughran and Ritter (2002). They argue that entrepreneurs are more tolerant towards excessive underpricing since managers maximize their personal wealth in the IPO by contributing with or selling their own shares. The recent increase in their personal wealth will lessen their bargaining power towards the underwriter when negotiating the initial offer price. In the research by Brau and Fawcett (2006) managers mean underpricing expectation is 14.9%, whereas the actual mean underpricing is 27.8%. Managers' motivation for the underpricing is to compensate investors for the risk of the IPO.

2.4 Allocation in IPOs

The total number of shares offered in the IPO is allocated to either private or institutional investors. Past researches show that allocation and underpricing are closely related in the IPO process (Loughran, Ritter and Rydqvist (1994)). The allocation of shares is important for the IPO process to determine initial trading activities, future ownership and the effects that different ownership structures imply.

2.4.1 Previous Allocation Studies

In this section we will take a closer look at three prior studies that are similar to our research and in the next section present some of the main underlying theories that have been put forth in the academic literature concerning the IPO allocation. These theories will be described in

some detail, and in later chapters be compared to and challenged by the results we have produced in our study.

2.4.1.1 Hanley and Wilhelm (1995)

In their article, Hanley and Wilhelm are first to present direct evidence of institutional domination in initial return after an IPO. They use data, consisting of 38 IPOs during 1983-1988 from a single underwriter in the US.

By using the information gathering theory (Benveniste and Spindt 1989), they predict why underpriced shares will be concentrated to institutional investors. In order to participate in the favorable offerings it is a quid pro quo assumption that they are also obligated to participate in offerings that are less underpriced. Therefore, Hanley and Wilhelm believe that underwriters behave strategically in their allocation decision and not discriminatory. Since the behavior from institutions will promote efficiency in the market. Their findings also contradict Rock's (1986) argument that informed investors will avoid overpriced issues and dominate underpriced issues.

2.4.1.2 Aggarwal et al. (2002)

Aggarwal et al. (2002) analyze a data set of 174 US offerings between 1997 and 1998 to find if favorable institutional allocation evidence exists.

According to Aggarwal et al., underwriters have considerable freedom of discretion how to allocate shares. This leads to the possibility for underwriters to favor certain investors that will benefit in the aftermarket trading of "hot" IPOs. They find that underwriters indeed favor institutional allocation in IPOs priced above the mean of the offer range which indicates high premarket demand. Whereas when premarket demand or indicative price is low institutions receive less allotment. These findings are consistent with (Benveniste and Spindt (1989), Cornelli and Goldrieck (2001) and Maksimovic and Pichler (2001)). Aggarwal (2002) also suggest that institutions may also be granted more shares in an issue in exchange for a commitment to purchase additional shares in the aftermarket.

2.4.1.3 Jenkinson and Jones (2004)

In their article they use evidence from 24 European IPOs from a single underwriter to analyze factors that influence the allocation decision and how investors bid. They find three ways how underwriter discretion is used in allocation practices. First, according to the information gathering theory (Benveniste and Spindt (1989)) underwriters may use allocation as an incentive for investors to reveal positive information. Second, allocation to long term investors is emphasized. Third, allocation is related to the subsequent trading commission.

Cornelli and Goldrieck (2001) found that bids that were informative, price limited, submitted early or revised during the book building period in fact received higher allocation. In contrast Jenkinson and Jones (2004) find little evidence on such treatment. Thus, the importance of price revelation in European IPOs during book building is reduced. However, they suspect a type of informal book building behavior prior to the public offering. Another observation is that loyalty is not rewarded through allocation, although large bids are rewarded with more allocation.

2.4.2 Main Allocation Theories

2.4.2.1 Winner's Curse

According to Rock (1986), pricing too high might bring fear of winner's curse to uninformed investors. In winner's curse, uninformed investors are aware of the risk of paying too much for their share by bidding too aggressively or being too optimistic. This could lead to an uninformed investor receiving full allocation in overpriced IPOs but only partial allotment in underpriced issues.

2.4.2.2 The Information Gathering Theory

This theory was presented by Benveniste and Spindt (1989). They state that there is an informational gap between the underwriter and some of the informed investors. To compensate these investors for providing valuable pricing and demand feedback, the IPOs will on average be underpriced.

2.4.2.3 The Free Rider Problem

Sherman and Titman (2002) describe the free rider problem to be present when information is costly for investors to find. Instead of finding their own information some investors will free ride on the information of others. To mitigate this problem IPOs has to be sufficiently underpriced to give an incentive to all investors to collect information.

2.4.2.4 Informational Cascade

Welch (1992) introduces the theory of informational cascade. Investors try to judge the interest of other investors and only request shares when the offering is hot. By overpricing the offering the issuer risks complete collapse of the IPO if investors stay out of the investment because of hesitation from other investors. An interesting finding by Amihud, Hauser, and Kishner (2001), show that IPOs are either undersubscribed or immensely oversubscribed, only leaving a few IPOs moderately oversubscribed.

2.4.3 Overallotment⁷

Aggarwal (2000) argue that underwriters use the overallotment provision (usually 15%) to stabilize the aftermarket trading in the stock. According to Brau and Fawcett (2006) the overallotment issue seems to be of little concern for the CFO, although their confidence in the underwriter and the IPO increases if the underwriter takes a stake in the offering. Zhang (2004) argue that allocation of additional shares boost aftermarket demand for the share. This is explained by the idea that institutions are likely to hold their share in the initial aftermarket whereas if they do not get any allocation they are not likely to buy in the aftermarket due to the higher price of a block of shares.

In contrast to all models and theories that claim big investors add value to the IPO process, Booth and Chua (1996) argue that retail investors are more valuable due to flipping⁸ of large investors. This evidence towards overallocation towards retail investors due to flipping by

⁷ Over allotment is a predetermined amount of shares that may be used in the offering when demand is high.

⁸ Flipping is when an investor temporarily buys shares and then quickly turn around and sell them again

institutions is also supported by Cheng et al. (2002) in the Hong Kong market. To restraint flipping activities, the lead underwriter can impose a penalty bid⁹ or a moral suasion¹⁰.

⁹ Penalty bid is when the lead underwriter withdraw commission from a broker that sold shares that flipped

¹⁰ Moral suasion is when the underwriter threaten to withhold future allocation in hot issues

3. Methodology

In this section the data gathering will be discussed along with a description of the variables used in our quantitative research, sample selection, the statistical method, our interview technique, and the reliability and validity of the paper.

In our theoretical part, several authors have found that institutional investors are favored in the IPO process through higher allocation in hot issues. Reasons why underwriters behaved in this manner were also presented. In the remainder of our paper we will investigate if this is true in the Swedish market.

This investigation will be conducted through empirical research using regression analysis and other statistical tools, complemented with interviews. The research will be conducted under the hypothesis that there is no discrimination in the Swedish IPO process.

$H_0: \beta = 0$

$H_1: \beta \neq 0$

To a large extent we have used methods discussed in an article by Hanley and Wilhelm (1995) with additional insights from Aggarwal et al. (2002) keeping in mind that their papers were focusing on the US market. Therefore, slight adjustments to their procedures are made to better fit the Swedish market. The most prominent adjustment is the exclusion of the underwriter reputation dummy. This dummy variable is taken out because of the relatively small number of underwriters in the Swedish market and lack of a sound way to measure reputation. Days in registration is also left out since all observations in our sample has a registration length of around ten business days with small deviations.

3.1 Data

In order to conduct our study we collected data from several IPO variables. These variables will be discussed in turn in the next section. The range of our IPO data is from 2000 to 2006 with a total sample of 19 observations. The observations we collected are from a total population of 41 IPOs in Sweden during this time period. For some of the statistical tests only IPOs with a price range could be used, which decreased the sample to 17 observations. As will be shown later this sub-sample shows the same statistical characteristics as the slightly larger sample.

For the purpose of this study, the most important variable was the final allocation between institution and retail investors in the IPOs. Since data on allocations within IPOs is not public information we had some difficulties when collecting our data. We contacted the Swedish finance authority¹¹, SIS service to stockholders¹² and the Swedish securities agency¹³ but they were all unable to help us. To find this critical piece of information we contacted seven underwriters that had been lead or co underwriters for IPOs in the Swedish market. Two banks responded with the information needed.

¹¹ Finansinspektionen (FI)

¹² SIS Ågarservice

¹³ Värdepapperscentralen (VPC)

Most of the companies in our sample only used one underwriter; in these observations the aggregate allocation for the issue is given. However, in some, a syndicate of underwriters is used. In these, the allocation given by our source is used as a proxy for the aggregate allocation. The mean and median institutional allocation in the sample is 92.6%, which is higher compared to research on the US market that provides mean and median allocation of around 60 to 70 % (Hanley and Wilhelm (1995) and Aggarwall et al (2002)).

The data for the other variables, discussed in the next section, were collected from EcoWin, OMX, Stockholm stock exchange, and the prospectus of each of the companies in the sample.

3.2 Variables

This section contains a short presentation of the variables. The variable Return Data will later be used as dependent variable in our regressions, whereas Allocation will be used as both dependent and independent. Furthermore, Proceeds and MIDDEV will be used as independent variables. All variables presented have been used in previous research.

3.2.1 Return Data

In order to measure the returns of the IPOs in our sample, we collected first, tenth and twentieth day closing prices of each stock from the EcoWin database and the webpage of OMX. The return data is derived by dividing the difference between the closing price and the offer price by the offer price.

$$\text{Return} = (\text{offer price} - \text{closing price}) / \text{offer price}$$

3.2.2 Allocation

As mentioned earlier the allocation data was given to us by two investment banks. The allocation variable will be presented as either retail or institutional allocation, where data is recorded in decimal form and retail plus institutional allocation is equal to one

3.2.3 Proceeds

The total proceeds from each issue were found in a database provided by the Stockholm stock exchange. In some observations proceeds was given by the investment bank as well. Since these figures in many instances were the same as the figures provided by the database, we decided to use the database for consistency. Since this variable is quite skewed the natural logarithm of proceeds, titled LOGPROCEEDS, is used in the regressions. This variable will be used as a proxy for the size of the IPO in one of our regressions.

3.2.4 Shares Offered

This variable was derived by dividing the proceeds for the issue with the offer price. To verify the information we compared it to the total number of shares of the issues given in the prospectus. In some cases there were small deviations in the data, but these were proved to be statistically insignificant. Shares offered will only be used as statistical information and not in our regressions.

3.2.5 Offer-range

In 17 of the issues in our sample an offer-range was given in the prospectus. According to Swedish standards the offer price is usually set within this range. However, there have been cases where the price has been set below, but never above. The final offer price was found in a database provided by the Stockholm stock exchange.

The size of the offer-range is given as a percentage of the mean of the interval. It is calculated by dividing the range with the mean of the interval. We have not used this variable in any of our regressions, but merely as a description of underwriter behavior.

$$\text{Size of offer-range} = (\text{upper limit} - \text{lower limit}) / \text{mean of the offer-range}$$

3.2.6 MIDDEV

MIDDEV is short for mid-point deviation. MIDDEV shows how far from the middle of the offer-range the final offer price is set. It is calculated by dividing the offer price less the mean of the offer-range with the mean of the offer-range, which gives the percentage difference between the midpoint and the offer price. MIDDEV is an indication for premarket interest since MIDDEV will be high and positive when the offer price is set far above the midpoint of the offer-range. This particular event will occur when the underwriter receives many orders and has no problem filling the order-book since demand is high.

$$\text{MIDDEV} = (\text{offer price} - \text{mean of the offer-range}) / \text{mean of the offer-range}$$

3.3 Sample Selection and Descriptive Statistics

The selection of sample was entirely dependent on the data that were made available to us from the investment banks. We approached seven banks from the beginning and as mentioned above two of these responded with information. The other five responded but did not provide any information at all. Two reasons were given; either they referred to the secrecy and sensitivity of the information or that they did not have access to this type of information.

We have included primary listings on the Stockholm Stock Exchange in our research. At first we included data back to 1997 in our sample and at that point we had a sample size of 31 issues out of a population of 119. However, when comparing this sample to the population, large differences were discovered. A reason for the differences can be contributed to the enormous amount of IPOs that were conducted in the late 90's but could not be included in our sample since this data was not available to us. Almost 85% of all IPOs in the population were issued between 1997 and 2001 compared to just over 40% in the initial sample. Therefore we decided to investigate IPOs issued in the 21st century. This decision scaled our sample down to 19 observations out of a population of 41, but the new sample gave a much more comparable reflection of the population for the variables used.

Table 1 show the number of IPOs performed each year during our research period included in our sample and the total population. The last column, population*, shows IPOs that we could obtain data from in order to compare the descriptive statistics between our sample and the

population. Three observations in 2000 and one observation in 2001 were excluded from the population because of bankruptcy.

Table 1.
Distribution of IPOs for the sample and population observations.

Year	Sample		Population		Population*	
2000	2	10.5%	21	51.2%	18	48.6%
2001	5	26.3%	6	14.6%	5	13.5%
2002	5	26.3%	4	9.8%	4	10.8%
2003	0	0.0%	0	0.0%	0	0.0%
2004	1	5.3%	3	7.3%	3	8.1%
2005	4	21.1%	5	12.2%	5	13.5%
2006	2	10.5%	2	4.9%	2	5.4%
Total	19	100.0%	41	100.0%	37	100.0%

The sample data from 2002 includes more observations than the population because the banks that gave us access to data co-managed two of the issues in this year. Instead of averaging the allocations we included both in order not to lose observations from our already small sample. This will not create a bias in our sample since the banks, in both issues, had different allocations between institutional and retail investors and therefore are used as four different observations in our sample.

The next two tables show descriptive statistics of the sample and the population. T-tests were conducted on several variables to check if the means of these are the same, i.e. if our sample is representative for the population. The variables checked includes first day return, proceeds, and offer price. The difference between the 5.79% mean first day return of the sample and the population mean first day return of 6.06% is not statistically significant with a t-value of -.059. The difference in means in proceeds and offer price has t-values of .880 and .330 respectively and therefore we fail to reject differences in the means between the sample and the population.

Because of the low sample size a nonparametric test was also conducted to check if our sample is a good representation of the population. The nonparametric test used is the Wilcoxon signed ranks test and the general result of this test support the t-tests made earlier. The difference between the median of first day return in our sample and the population is not statistically significant with a p-value of 1. The p-value for difference in offer price between the sample and the population is 0.8497, which also shows that there is no statistically significant difference between the two series. The only test that did not show the same results as the t-test was the Wilcoxon test applied on proceeds. This test shows that the sample does not have the same median as the population.

The Wilcoxon test was also used to test if the variances in the sample are statistically different from the variances in the population for the chosen variables. With a p-value of 0.4650 we fail to reject that the variance in proceeds in the sample is equal to the variance in proceeds in the population. Furthermore, the p-values of the tests with the other variables are for first day return 0.4022 and for offer price 0.4829, suggesting that the sample is a good representation of the population.

Table 2.
Descriptive Statistics for our sample across some variables

Characteristic	Mean	Median	Std Dev	Max	Min
Proceeds (in million kr)	1 519,76 kr	1 350,00 kr	1 439,71 kr	5 143,00 kr	86,00 kr
Shares Offered (in millions)	19,52	12,82	18,76	75,04	1,51
Offer Price	81,16 kr	65,00 kr	39,36 kr	190,00 kr	38,00 kr
MIDDEV	-0,74%	0,00%	9,24%	12,96%	-26,45%
Initial Return (Day 1)	5,79%	4,91%	12,51%	37,23%	-16,13%
Initial Return (Day 10)	3,93%	4,26%	13,02%	33,33%	-20,97%
Initial Return (Day 20)	6,52%	8,70%	18,79%	44,74%	-25,81%
Inst Allocation	92,63%	92,10%	4,13%	99,00%	85,00%
Retail Allocation	7,37%	7,90%	4,13%	15,00%	1,00%
Size of Offer-range	20,82%	19,18%	7,22%	34,48%	5,41%

Table 3.
Descriptive Statistics for the population* during our research period, Telia excluded.

Characteristic	Mean	Median	Std Dev	Max	Min
Proceeds (in million kr)	1 144,34 kr	460,50 kr	1 572,76 kr	6 100,00 kr	44,00 kr
Shares Offered (in millions)	13,99	7,80	17,85	75,04	0,88
Offer Price	77,56 kr	67,50 kr	38,72 kr	190,00 kr	20,00 kr
Initial Return (Day 1)	6,06%	4,14%	13,30%	37,71%	-16,13%
Initial Return (Day 10)	0,47%	4,59%	20,13%	33,33%	-69,07%
Initial Return (Day 20)	-0,81%	4,03%	24,68%	44,74%	-70,37%

3.4 Statistical Method

The statistical method used to test our hypothesis is Ordinary Least Squares (OLS). In order to make correct inferences from the coefficients in the regressions the estimators determined by OLS should be Best Linear Unbiased Estimators (BLUE). To see if they are indeed BLUE the disturbance term (ϵ) has to fulfill certain assumptions, discussed below, according to Brooks.

For each of our regressions we have conducted tests in order to ensure that the error term is BLUE. By including an intercept in the regressions we make sure that the errors have a zero mean. To test for heteroscedasticity, White's test with no cross terms was used. Since the null hypothesis is homoscedasticity a high p-value will fail to reject this null.

The error terms in the regression has to be normally distributed to be able to make valid hypothesis tests. To test for normality the Jarque-Bera test is used. The null hypothesis of this test is normality, which will not be rejected if the distribution of the error terms follows a symmetric and mesokurtic distribution.

A large correlation between the independent variables will generate a regression that will look good and give a high R^2 , but the individual coefficients might not be significant. Therefore, a correlation matrix between the variables is created to be able to observe if there might be a problem with multicollinearity.

To see if the function has the correct functional form the general Ramsey's RESET test was run. The null of this test is that the functional form is correct.

Most of our regressions, which will be described in the next section, contain only one explanatory variable. However, in one case we include two independent variables in the regression and in this case multiple regression analysis is used.

3.4.1 Allocation and First Day Return

The first step when trying to investigate if institutional investors are favored was to regress first day returns on institutional allocation. In order to be able to make inferences on the result the mean of positive initial returns has to be statistically different from the mean of negative initial returns. Therefore a two-sample t-test was conducted. The same test was used to verify that the allocations in the different groups (positive initial return and negative initial return) were statistically different from each other.

To check if there is a relationship between first day return and institutional allocation the following OLS regression was prepared in E-views.

$$\textit{Return Day One} = \alpha + \beta \textit{Institution} + \varepsilon \quad (1)$$

This regression differs slightly from the regression by Hanley and Wilhelm (1995). They also included a variable for underwriter reputation. We found this variable irrelevant for reasons discussed earlier. This regression only show if first day return is influenced by institutional holding, and one cannot infer that institutions are favored based on this regression since the allocation is set before the first day of trading and technically the underwriter cannot know the return of an issue in advance.

A positive relationship between these variables, which would be shown by a positive β -coefficient, was expected since prior research on the topic has suggested this relationship. However, both our descriptive statistics and regression (1) indicate that the expected relationship is not true for the Swedish market. Therefore, we decided to check if there is a positive statistically significant relationship between first day return and retail allocation in the OLS regression:

$$\textit{Return Day One} = \alpha + \beta \textit{Retail} + \varepsilon \quad (2)$$

3.4.2 Initial Return and Premarket Demand

Further we wanted to check if underwriters favor retail investors and increase their allocation in a hot issue. This could be done by increasing retail allocation in issues with high premarket demand if initial return is dependent on premarket demand. Before moving on to this regression it has to be determined that the mean of the initial return when MIDDEV is negative is statistically different from the mean initial return when MIDDEV is positive. This is done by a two sample t-test.

Now the following OLS regression was estimated:

$$\textit{Return Day One} = \alpha + \beta \textit{MIDDEV} + \varepsilon \quad (3)$$

If initial return indeed is dependent on premarket demand (and that our MIDDEV is a good proxy for premarket demand) this should show up as a positive and significant β -coefficient.

3.4.3 Allocation on Premarket Demand

After determining a relationship between initial return and premarket demand, we moved on to see if retail allocation is increased when premarket demand is high. First we examine if the mean retail allocation when MIDDEV is negative is statistically different from the mean retail allocation when MIDDEV is positive by the use of a two sample t-test.

Now the following OLS regression was estimated:

$$\text{Retail} = \alpha + \beta \text{MIDDEV} + \varepsilon \quad (4)$$

The problem with this regression is that MIDDEV represents premarket interest from only institutional investors. So even though MIDDEV is high it can reflect a very high institutional demand but a considerably lower retail demand. This can happen when the issue is large because the normal retail customer base does not differ in relation to size, but rather depending on the business of the firm going public, according to one of our interviewees. To control for the size of the issue a proxy for issue size is included in the regression.

$$\text{Retail} = \alpha + \beta_1 \text{MIDDEV} + \beta_2 \text{LOGPROCEEDS} + \varepsilon \quad (5)$$

If this regression turns out as expected, β_1 should be positive indicating a favorable allocation to retail investors when premarket demand is high, and a negative sign on β_2 since in SEK the normal retail customer base will invest approximately the same for any issue independent of size, which will show up as a smaller percentage the larger the issue.

3.5 Interviews

The use of interviews is a common feature in student research papers. In our case, we want to add information to our research paper by conducting qualitative interviews. The interviewees are two persons from the investment banks that also provided data input. We want to complement the quantitative research in this way because of the rather closed environment of the IPO process.

There are several international research papers and numerous theories concerning IPO processes and behavior based on historical data. However, the interviewees give an up-to-date inside view on the Swedish IPO process to compare and evaluate our empirical findings from the regression analysis and to add validity to our paper. Since there are not many rules or laws governing the IPO process, it is imperative to find out how investment banks use their discretionary power in general and towards allocation in particular.

By using interviews we will get an insight to how the allocation decision is made. Our questions will also shed light on the general IPO process. Without interviews we can only speculate why shares are allocated differently. The method we have chosen for conducting our interviews is the qualitative interview method suggested by Kvale (1997). It has been set up in 6 steps accordingly: Planning, Interview situation, Transcription, Validation, Interpretation, Presentation of findings.

3.5.1 Planning

Before we write our questions we have to think about what information we want to receive from the interviews. In order to add information to our study, we want to have questions directed towards allocation but also add information about the process. Since discretion is used in allocation, we want our questions about the IPO process to be rather open ended to get the interviewee to describe the process of how they conduct an IPO. The questions towards allocation are more specific in order to get detailed and comparable information to explain our findings.

3.5.2 Interview Situation

Even though we are under time constraint we decided that we would get the best results from our interviews if we met in person with our interviewees. So we set up meetings in Stockholm with our two contacts for approximately one hour. At the meeting we presented our agenda for the meeting and what information we expected to receive. Prior to the meeting we had compiled a set of questions we would ask both banks.

3.5.3 Transcription

To give an objective view of the interview we present the results/answers in the empirical findings part of this paper.

3.5.4 Validation

By interviewing persons with key insight and experience of the IPO process, we find their answers reliable as a source. In order to get validity we also used the same set of questions (open ended for the process and specific for allocation) for both banks.

3.5.5 Interpretation/Presentation of Findings

We present our interpretation and the contribution of the answer to our problem in the analysis and concluding part of the research paper.

3.6 Reliability and Validity

In order to judge the research results credibility and quality we use terms as reliability and validity. This check will differ some for our quantitative and qualitative methods. When it comes to checking for reliability and validity in our regression analysis we want to use a method and get results that can be retested if someone else was to conduct a similar research and compare results. Validity means that our input in the regression analysis is relevant to test our hypothesis and get results that contribute further understanding about the phenomenon of allocation and returns.

When it comes to our qualitative interviews we want them to add personal information and reflections from our interviewees about the allocation decision. However, it is still important to look for validity through contribution of relevant information and that the persons in the interviews are credible sources. We get validity in our interviews by interviewing two persons from two leading investment banks that are directly involved and responsible for the

allocation decision within an IPO. Our standard interview questions used for both banks are attached in appendix 6 and you find the results in our empirical findings.

We believe that by combining our quantitative analysis with qualitative research we will increase the reliability of our research. The quantitative research will show if indeed there is discrimination in the allocation process in Sweden. The interviews with the underwriters will give some explanations why IPOs are allotted the way they are between retail investors and institutions.

4. Empirical Findings

So far we have mentioned several theories related to the subject we are investigating and presented how we have conducted our research. In this section we will present the results of our quantitative and qualitative study. For the regressions only the most important figures are presented in the text. However, other more or less relevant outputs and test results from all regressions are presented in Appendix 1-5.

4.1 Statistical Findings

4.1.1 Allocation and First Day Return

Table 4 begins our research whether there is discrimination in the IPO process by presenting the descriptive statistics on the first day returns of the observations in our sample along with characteristics for the different groups. With a t-statistic of -4.60 it is proven that the mean of the initial returns that are less than zero are statistically different from the mean initial returns that are greater than zero, significant at 1%. The mean institutional allocation for the two groups are barely statistically different at a significance level of 10% (t-stat = 1.74).

To support our findings we also used the Wilcoxon signed rank tests on the initial return and the allocation series. With a p-value of 0.0025 we reject the null that the median of the series with initial returns less than zero is equal to the series with initial return greater than zero, supporting the t-test. The Wilcoxon signed rank test also shows, with a p-value of 0.0021, that the median institutional allocation for the two groups is statistically different from each other at the 1% significance level.

Table 4.
Descriptive statistics when first day return is negative, zero and positive.

<i>(in millions SEK)</i>	Initial Returns less than zero	Initial Returns equal to zero	Initial Returns greater than zero
Number of Issues	4	2	13
Mean Initial Return	-11.02%	0.00%	11.85%
<i>Median Initial Return</i>	<i>-9.49%</i>		<i>9.02%</i>
% of Issue sold to institutional investors	95.38% <i>97.50%</i>	93.50% <i>93.50%</i>	91.65% <i>92.00%</i>
Mean kr profit (loss) earned by institutional investors	-85.35 kr <i>-92.18 kr</i>	0 kr	191.01 kr <i>97.88 kr</i>
Mean kr profit (loss) earned by retail investors	-1.95 kr <i>-1.78 kr</i>	0 kr	15.63 kr <i>10.32 kr</i>
Total kr profit (loss) earned by institutional investors	-341.40 kr	0 kr	2,483.14 kr
Total kr profit (loss) earned by retail investors	-7.78 kr	0 kr	203.23 kr

Table 5.
Results from regression (1)

Dependent Variable: Return Day 1				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
INSTITUTIONAL	-1.391285	0.651990	-2.133905	0.0477
C	1.346607	0.604484	2.227698	0.0397
R-Squared	0.21			
Adj R-Squared	0.16			
Std. Dev.	0.11			
# of Obsevatons	19			

After running our first regression and observed the negative and significant coefficient on institutional allocation combined with the observations in table 4, showing more institutional allocation when initial returns are negative, we decided to focus on the retail allocation instead. Since retail allocation + institutional allocation = 1, the regressions will show the same characteristics no matter which variable you use, except the size and sign of the coefficients. So if we determine the retail investors to be favored that will also reject the null of no discrimination.

Table 6.
Results from regression (2)

Dependent Variable: Return Day 1				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RETAIL	1.391285	0.65199	2.133905	0.0477
C	-0.044678	0.054765	-0.81582	0.4259
R-Squared	0.21			
Adj R-Squared	0.16			
Std. Dev.	0.11			
# of Obsevatons	19			

At a 5% level this regression shows that allocation does explain a statistically significant part of the cross-sectional variation of initial returns. It implies that if retail allocation is increased by 1 percentage point the first day return on the company will be 1.39 percentage points higher. The adjusted R^2 suggests that the allocation decision explains about 16% of first day returns.

4.1.2 Initial Return and Premarket Demand

Table 7 shows the descriptive statistics of initial return and allocation when the offer price is set below, on, or above the midpoint of the offer range. Since there is only one observation when MIDDEV is equal to one nothing can really be said about this column. However, it is the other two that will add information to our research question. From the two sample t-test, the initial return on day one for the two samples has a mean that is statistically different from each other at a 10% significance level. Also, the allocations in the two samples are different from each other using the same significance level.

The Wilcoxon signed ranks test shows that the median initial return for the two groups are statistically different from each other at the 5% significance level (p-value = 0.0141). Also,

the allocations in the two samples are different from each other using the same significance level (p-value = 0.0143).

Table 7.

Descriptive statistics when the offer price is set below, on or above the midpoint of the filing range.

<i>(in millions)</i>	MIDDEV < 1	MIDDEV = 1	MIDDEV > 1	
Number of Issues	8	1	8	17
Initial Return (Day 1)	-1,51%	4,91%	8,03%	
	-4,49%	4,91%	7,70%	
Initial Return (Day 10)	-5,15%	3,13%	8,41%	
	-5,50%	3,13%	6,48%	
Initial Return (Day 20)	-5,48%	12,05%	14,29%	
	-10,64%	12,05%	13,20%	
Institutional Allocation	94,56%	95,00%	90,95%	
	95,50%	95,00%	92,05%	
Mean First Day Profit to Institutions	15,95 kr	196,03 kr	108,43 kr	
	-7,44 kr	196,03 kr	87,95 kr	

The results from regression (3) are shown in table 8. With a t-stat of 1.93, MIDDEV can be said to statistically influence first day returns for an IPO. Since the relationship between demand and price appreciation is quite fundamental in economic theory the result is not surprising. However, it is important for our research since this result validates our variable MIDDEV as a good proxy for premarket demand. The positive coefficient of 0.46 on MIDDEV states that an increase in MIDDEV will cause first day returns to appreciate by around half that increase. Further the adjusted R^2 indicates that premarket demand explains 14% of the variation of first day returns.

Table 8.

Results from regression (3)

Dependent Variable: Return Day 1				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MIDDEV	0.458935	0.238264	1.926166	0.0733
C	0.037412	0.022728	1.646031	0.1205
R-Squared	0.20			
Adj R-Squared	0.14			
Std. Dev.	0.09			
# of Observations	17			

4.1.3 Allocation on Premarket Demand

The results from regression (4) are presented in Table 9. As shown below the coefficient on MIDDEV is not significant and we cannot reject that the relationship between retail allocation and premarket demand is equal to zero at conventional significance levels.

Table 9.
Results from regression (4)

Dependent Variable: Retail				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
MIDDEV	0.155395	0.106758	1.455585	0.1661
C	0.073109	0.010184	7.178966	0
R-Squared	0.12			
Adj R-Squared	0.07			
Std. Dev.	0.04			
# of Obsevation	17			

Therefore, LOGPROCEEDS is included in the regression as a proxy for issue size. These results are displayed in Table 10. Both coefficients are significant, and the first one suggests that there is a negative relationship between retail allocation and the size of the issue. As expected there is also a positive relationship between retail allocation and premarket demand.

Table 10.
Results from regression (5)

Dependent Variable: Retail				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGPROCEEDS	-0.034124	0.00688	-4.96005	0.0002
MIDDEV	0.373144	0.079724	4.680422	0.0004
C	0.30636	0.047452	6.456148	0
R-Squared	0.68			
Adj R-Squared	0.64			
Std. Dev.	0.03			
# of Obsevation	17			

4.2 Interviews

4.2.1 The IPO Process and Allocation

To add information to our empirical findings we also interviewed two representatives from two Swedish investment banks, these are the same banks that supplied us with data for our research. Due to our agreement of confidentiality the interviewees will be related to as Bank A and Bank B. Bank A works in the corporate finance division and Bank B works in the ECM¹⁴ division. The person participating in the interview from investment bank A has brought about ten companies to the market. The person from investment bank B has brought about 20 companies to the market.

In this section we display their personal input on the IPO process in general and the allocation decision specifically. To get an accurate response we decided to do the interviews in person even though we are restricted by time. We believe their views are an important input in order to add information in a discretionary process. Below you can see their responses.

¹⁴ Equity Capital Markets

4.2.2 IPO Method and Process

4.2.2.1 *Investment Bank A*

The IPO process starts with an invitation from a company to underwrite the offer. The bank then has to turn in an estimation of the value of the company and compete for the deal; this usually takes place approximately six months before the introduction. The bank awarded lead underwriter closely follows the company and the market until the offering and constantly update the valuation of the company. In order to find an estimation of the market value they also conduct pre-marketing; this is where the analyst approaches between 10-30 institutional investors and communicate his/her view of the value (using DCF and comparables) and collects feedback from the investors.

It is hard to define a successful IPO due to different preferences from the seller. A successful IPO from the company's perspective is the positive attention they receive and that sellers and buyers are content. Some companies want to receive as high price as possible, whereas other sellers want the price of the stock to increase rapidly in the aftermarket to create attention. Receiving a high price initially will be profitable in the short run but may create negative publicity in the long run if the price drops.

The most important part of the process is hard to define but setting the price and the marketing of the IPO are crucial.

4.2.2.2 *Investment Bank B*

The process starts with data being transferred from the company to an analyst at the bank in order for the analyst to create a research report that will serve as a sales document. This document is used to educate investors about the company. In order to find an approximation of the market value of the company the bank will test the market through pilot fishing, where the bank visits around ten potential domestic and foreign investors. The feedback will dictate the price range where the seller should be willing to sell. The feedback also contains areas of concern from the buyer that can be improved in order for the IPO to be successful. The report is revised by the analyst and the pre-marketing phase can be initiated.

The analyst then presents the report to all potential investors in the Nordic region, Europe and the US. The purpose of this step is to educate the investors about the company and deliver the bank's view of the value and the market. The investors then make their own valuation and contribute with an estimation of the price they are willing to pay.

The pre-marketing phase is followed by an official announcement about the offer. This is also the start of the road show which usually last between eight and fourteen days. The road show is a way for management to market the company but they are restricted to only reveal information that is stated in the prospectus. In this part of the process the investors will update their valuation and hopefully place a bid.

4.2.3 Price range

4.2.3.1 Investment Bank A

After the pre-marketing phase the price range for the prospectus is set. The price range is usually set at approximately 15%. The size of the price range reflects uncertainty in the market. The original price range is rarely adjusted since the consequence would be revision of the prospectus, additional press releases and new subscription forms. If the price range would be adjusted it is easier to administrate a lower range than a higher. However, this is very rare. The main motivation for a fixed price instead of a price range is that the seller wants to know for certain what price they can expect. Another motivation is when the offer is very small institutions feel reluctant to spend time on price discovery.

4.2.3.2 Investment Bank B

The input from pre-marketing combined with their DCF and Comparable companies analysis is used to set the price range. The price range can differ in size due to uncertainty in the market and how thoroughly the underwriter researched the market in the pilot fishing and pre-marketing period. According to Bank B, a price range of 15% to 20% is normal. A price range that is too large can signal uncertainty but if the price range is too small, flexibility decreases and the IPO becomes more exposed to the time and market risk during the book building period. For instance, if a comparable company operating in a similar market presents a bad report or another negative event occurs, a larger price range gives more flexibility to adjust the IPO price for this event.

4.2.4 Book Building

4.2.4.1 Investment Bank A

Investment bank A defines their IPO process as book building which consists of a period of ten to fourteen days when the bank builds the order book. During this period management together with the bank conducts a road show where they meet potential investors and market the company. In the book building period institutions and retail investors will place their orders. The main difference between the two investor groups is that institutions have the option to place orders with price limits and size, whereas retail investors only commit to buying a certain amount of shares regardless of final price. Institutions also have the possibility to place several orders at various prices with limitation on how much they are willing to buy at each level. When the book closes, the final price is set with optimal demand in mind and also after discussion with the seller. The final price is fixed to all investors, retail and institutional.

4.2.4.2 Investment Bank B

During eight to fourteen days prior to the introduction management presents the company to potential investors. However, management may only reveal information that is already available in the prospect. According to bank B this is a crucial part of the process, since the investor will make up their mind about the people running the company. During the road show and book building period institutional investors also place bids in the order book. They will show their price sensitivity through limits on the bids. This is the main purpose of the

book building process; to discover the price sensitivity among investors. Retail also submit their bids during the book building process.

The bid can differ in terms. Either a bid with only the preferred amount of shares, regardless of price, can be submitted or bids that are tied to a certain price and number of shares can be used by institutional investors. For instance, a practice that can be used is to place several bids differing in price and size. The bidding process will show the seller the price sensitivity of the investor and the market as a whole.

Up until the order book closes the investor can withdraw their order at any point in time. During the book building period the bank keeps the seller updated on the estimated final price. Bank B prefers to have the order book oversubscribed three to four times; this can be viewed as an indicator of where to set the final price. Retail investors also have to place their order during the book building period, but their final date is usually one day prior to the official closing day due to logistics.

4.2.5 Investor Behavior

4.2.5.1 Investment Bank A

It is impossible to determine if institutions are more or less long term than retail investors. However, it is easier to categorize investors within the institutional segment as being long or short term. This distinction is very difficult to define in the retail segment. Bank A also emphasizes the importance of domestic institutional participation in order to attract foreign investors. Grade A domestic institutional investors are also important for the company over the long run, it sends a certification signal to other investors and they also tend to keep their investments over a down turn in the market.

The investment bank monitors the institutional behavior in the aftermarket through their ECM division to find suitable investors for future IPOs. The bank also looks at current ownership within the institution in order to see their investment focus.

4.2.5.2 Investment Bank B

Bank B ranks their institutional investors in four groups. They always target the highest ranked group since they represent a committed long term investor and send a strong positive signal to the market. A common feature of the highest ranked investors is their tendency to increase their ownership by purchasing shares in the aftermarket. The bank systematically follows the behavior of the institutions and constantly updates their rankings. All institutions are not long term investors but generally large funds are considered to be long term. Bank B feels that behavior in retail ownership is based on the development of the stock but it is very hard to predict.

A way for the seller to control the behavior of the underwriters is to have a base fee that is always paid and an incentive fee that can be paid out ex post, depending on the outcome.

Bank B does not believe institutions are compensated for their feedback through intentional underpricing. However, the feedback is incorporated to set the proper market price in order for the IPO to be successful. A successful IPO has a price appreciation of about 5-10% over the first week of trading, and that the company delivers in line with forecasts in the prospectus over the first year.

The main role of the underwriter is to mitigate the price negotiations between seller and buyer and estimate the highest price possible for a successful IPO.

4.2.6 Allocation

4.2.6.1 Investment Bank A

When determining the allocation, most importantly the bank has to follow the rules of ownership spread of at least 500 separate owners with at least one round lot (approximately SEK 10,000). Another guideline is to create liquidity in the aftermarket. Bank A implies that retail owners contribute to liquidity in the aftermarket. Retail ownership is tied to an amount regardless of the size of the offer, therefore the bigger the issue, less percentage of total ownership is allocated to retail investors. However, when demand is high they always want to allocate shares to all retail investors and at a higher proportion. Rules also demand a free float of at least 25%.

Allocation is also influenced by the type of industry in which the company operates. For example a retail company with private persons as end customers may want higher allocation to retail investors. The bank will recommend the most suitable allocation. However, if the company has a strong preference concerning the allocation different from the bank it is the customer who decides in the end.

The bank rewards institutional investors that are clear about the value of the company and adds valuable information in the process. Institutions that commits early in the IPO process are often prioritized in the allocation process if their commitment is strong. They show that they are long term investors and also participate in the aftermarket by buying additional shares.

4.2.6.2 Investment Bank B

Bank B also mention the free float rule of 25% and ownership spread of at least 500 separate owners with at least one round lot. Another interesting view is how allocation is dispersed depending on the type of underwriter. Bank B believes that retail ownership will be larger when a large retail bank acts as underwriter, since they have a natural private ownership base through their offices and banking clients. The nature of the firms business will have an impact on the allocation decision as also suggested by bank A. Bank B always allocates shares to all retail clients, even though it may be a scaled allotment. Since the institutional order book is usually more oversubscribed they get proportionally less allocation than retail.

After reviewing our results that point towards retail investors being favored, Bank B suggests Aktiespararna as an explanation to this discovery. Aktiespararna is a powerful organization that acts in the interest of retail investors.

5. Analysis

In this section the results found in chapter 4 will be analyzed and compared to the several theories presented earlier. Furthermore, some of our own suggestions to the results will be discussed and analyzed.

Looking at table (3) we see evidence of underpricing of about 6% in the Swedish stock market. This underpricing is supported by many previous studies on IPOs. (Chowdhry and Sherman (1996); Lee, Taylor and Walter (1999); Ljungqvist and Wilhelm (2002)). A reason for intentional underpricing could be to attract attention on the opening day by creating a buzz in the market, according to Demers and Lewellen (2003). Interviewee B agrees with this explanation of underpricing. Furthermore, Boehmer and Fische (2001) demonstrate that the trading volume of the stock in the aftermarket will increase with underpricing.

5.1 First Day Return and Allocation

Looking at table (4) it is evident that institutional investors receives the larger part of money left on the table¹⁵ in IPOs. This is because they constantly receive a much larger piece (mean allocation 92.63%) of the issues combined with the fact that IPOs are, on average, underpriced. This finding is in line with Stoughton and Zechner (1998) argument that underpricing allows for creation of block holders which will increase monitoring.

However, we find it interesting to observe that retail investors receive a proportionately higher share (7.57%) of issues that has positive initial return compared to issues with negative initial return (2.33%). This is the first time our research shows contradicting results to those investigations made on the US market by Hanley and Wilhelm (1995) and Aggarwal et al. (2002). Their research show, in addition to receiving a larger part on average, that institutions also receive a proportionately higher allocation in underpriced issues. However, our result still suggests, similarly to Hanley and Wilhelm (1995), that Rocks winner's curse model from 1986 fails to explain underpricing in IPOs due to asymmetric information between informed investors and uninformed investors since the informed investors take an equally large (or larger) share in overpriced issues as they do in underpriced issues. Under one condition we could verify Rock's model. That would be if we assumed that retail investors are informed and institutions are uninformed and that Swedish underwriters are passive in the allocation decision. However, given the structure of the Swedish IPO process this would be an absurd assumption to make.

The negative relationship between institutional allocation and first day return in our first regression (1) verifies the result from table 4. The coefficient is significant which suggest that the allocation decision does explain a proportion of the variation of first day return. As discussed before we decided to run the same regression but replace institutional allocation with retail allocation. Since retail allocation is equal to $1 - \text{institutional allocation}$, this regression shows the same characteristics as the original regression, but of course with an opposite sign and different magnitude of the coefficients. Either one of these regressions supports the findings in table 4, which show that retail investors are proportionately favored in Swedish IPOs, when underpricing is higher.

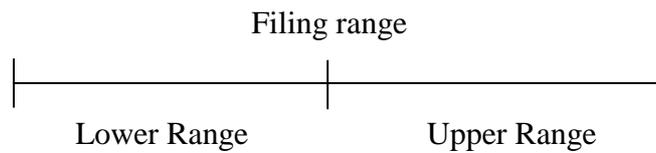
¹⁵ Money left on the table is a sort of slang for the price appreciation the first day of trading.

5.2 Initial Return and Premarket Demand

Since not even investment banks can see into the future, if they indeed discriminate deliberately there has to be some way of predicting first day return. According to economic theory in general (supply and demand) and the “partial adjustment” phenomenon by Hanley (1993) in particular, premarket demand is a good predictor of aftermarket short run performance. In his article, Ritter (1998) reports that almost all IPOs priced above the filing range experience positive first day returns, whereas only half of the issues priced below the price range had positive first day returns. Since Swedish standards prohibit price-setting above the range¹⁶ our relationship between initial return and premarket demand might not be as strong as previous research suggest. However, in support of Ritter’s finding, but with results comparable to the Swedish market, Aggarwal et al (2002) finds that underwriters allocate more shares to institutions when the IPO is priced at the upper end of the price range.

In our first investigation of the relationship between initial return and premarket demand there is a clear pattern where issues with offer prices set in the upper range of the filing range produces a mean first day return of 8.03%, and issues with offer prices set in the lower range has a mean first day *loss* of 1.51%.

Figure 1.



Our variable MIDDEV in table (5) is a reflection of where the offer price is set within the price range. Since the most important input when setting the offer price is institutional bids, because of the book building process, much of the aftermarket institutional demand should already be included in the offer price given a correct price range. Therefore, MIDDEV should not possess a direct power to determine first day return. However, the signal of a highly oversubscribed institutional order book will create higher demand among the less informed investors in line with the informational cascade theory (Welch (1992)), which will in turn create aftermarket demand with price appreciation as a result.

When regressing initial return on the percentage deviation of the offer price from the mean (regression (3)), we find that our proxy for premarket demand explains a significant part of first day return at a 10% significance level. By having access to the order book the underwriter can easily discover at what price the order book is preferably oversubscribed. Through this information the underwriter can fairly well control underpricing as long as this favorable oversubscription occurs within the price range. This finding is important for our research since through premarket demand the underwriter can make qualified guesses about the initial return of the stock and can make allocation decisions accordingly.

The largest misspricing should occur when the actual demand reflects a price either over the price range or under the price range. Since Swedish investment banks appear reluctant to change the initial price range, this unexpected demand will result in prices at the very top or

¹⁶ In a Swedish prospectus it is commonly cited that the offer price will not exceed the top of the price range

bottom of the price range, implying that the initial price range did not cover the actual demand.

The use of a price range has become increasingly popular on the Swedish market, and according to one of our interviewees the size of the price range reflects uncertainty in the market and gives the underwriter room to adjust the price before the offer price is set. Occasionally there are still some IPOs with a fixed price. The use of a fixed price will guarantee the issuing company a fixed amount of proceeds from the offering. However, by having a fixed price for an IPO, the issuing company is exposed to two risks related to market conditions and demand during the subscription period. First, they risk leaving a vast amount of money on the table. Second, since they surrender the possibility to adjust the price downward to account for unfavorable market conditions and demand, they may jeopardize the entire IPO.

In a recent example of a fixed price IPO, the stock appreciated 37% on the first trading day which shows that it was substantially underpriced. Prospect theory, suggested by Kahneman and Tversky (1979), suggest an explanation why managers/entrepreneurs, acting in self interest, might insist on having a fixed price on the issue. The investment bank on the other hand, has incentives both in favor and against pricing an issue at a low price. A low price will attract high demand without much marketing effort. However, the bank risk sending a poor signal to future companies going public, given these companies are concerned with other issues than management's private incentives.

5.3 Allocation on Premarket Demand

Our next regression (4) shows no significant relationship between retail allocation and MIDDEV. Perhaps somewhat surprising, but MIDDEV almost exclusively reflects institutional premarket demand. Even though this should be a good indication for the retail investor of the quality of the company, there are other variables that influence the allocation decision.

The reason that we find a stronger relationship between first day return and retail allocation compared to MIDDEV and retail allocation is that the institutional demand will be satisfied by the setting of the price in the range. Therefore, it should be the retail demand that drives first day return since all of their demand might not be incorporated in the offer-price. Consequently, first day return will have a stronger relationship with allocation than the relationship between MIDDEV and retail allocation.

According to one of our interviewees, the size of the issue is a very important variable because of the IPO process used in Sweden. Therefore, by itself, MIDDEV cannot explain retail allocation since for example even though MIDDEV is high (i.e high institutional interest) there can be low retail demand. Thus retail allocation can be small even though MIDDEV is high, suggesting that a size variable must be included.

In the following regression (5) where a proxy for size is included, we observe a negative sign on the size coefficient, which is opposite to the research of Aggarwal et al (2002). They motivate the positive relationship between retail investment and size, by suggesting that in a large issue the institutions are less likely to absorb the whole issue and therefore retail investors are needed to fill the order book. Beatty and Ritter (1986) suggest that this

relationship could be explained by lower risk in larger companies and therefore retail investors face fewer lemons in larger issues.

The first motivation of our opposing result is that the inability for institutions to cover the IPO is probably only valid for really large issues, like Telia. IPOs of this magnitude are uncommon in the Swedish market. Going back to 1997 the size of the Telia IPO is more than twelve times greater than the second largest IPO, Eniro, in 2000. We have the third largest issue in Sweden included in our sample and that issue has the highest institutional allocation out of our entire sample, which proves the capacity of the institutions to cover large issues as well.

Another motivation is the amount of IPOs conducted. There are considerably less IPOs conducted in Sweden compared to the US. According to Ritter and Welch (2002) the US had more than one IPO per business day between 1980 and 2001 compared to 4 IPOs per year in the Swedish market during the last five years. These market characteristics may suggest that there is proportionately more institutional capital available in the Swedish market for IPOs, whereas in the US market institutional capital have to be complemented by retail capital within the IPO to a greater extent.

The coefficient on MIDDEV in this regression is positive, which means that retail investors are proportionately favored. This is also a contradicting result when comparing our study to Aggarwal et al (2002) and Hanley and Wilhelm (1995). They both find evidence of higher allocation to institutional investors when the price is set above or in the high end of the filing range. They explain this phenomenon by information gathering theory (Benveniste and Spindt (1989)).

In Sweden, institutional investors are generally more favored through higher average allocation, this is in line with Jenkinson and Jones (2004) suggesting that allocation to long term investors is emphasized. Based on this fact, institutions might not need the extra allocation in highly underpriced issues as compensation for giving up information throughout the IPO process. From the bank's perspective they want the majority of the investors to be long term holders and only a fraction to be flippers. Flippers are needed in order to have liquidity in the aftermarket, but too many flippers in an issue will put downward pressure on the stock and force the bank to support the stock price in the immediate aftermarket. At least one of the banks we interviewed systematically monitors and rank institutional investors, and bases their allocation on facts concerning their behavior from earlier issues. Retail investors are harder to monitor and put a ranking on, therefore the bank takes more of a chance when allocating to private investors.

To decrease the risk of having to support the stock price in the aftermarket, retail investors get less allocation in low demand issues since the bank is concerned with flipping activities only in low demand. However, in high demand issues, supporting the stock price is not a risk since flipping in high demand will have other buyers than the bank. Furthermore, the flipping activity in a high demand issue is favorable to the bank since the sale of the shares will generate commission fees to the bank, as suggested by Jenkinson and Jones (2004).

6. Conclusion

With respect to the analysis we draw the following conclusions on our problem, testing if there is discrimination in the Swedish IPO market? We also present suggestions for further research.

According to our findings, contradicting those of Hanley and Wilhelm (1995) and Aggarwal et al. (2002), we discover that in the Swedish market, retail investors are proportionately allocated more shares when an IPO is more underpriced indicating that they are not discriminated against. However, since institutions are allocated a substantial part in IPOs overall, we conclude that in line with the information gathering theory, by Benveniste and Spindt (1989) institutional investors are rewarded through allocation for contributing to the book building process and helping with price discovery by placing informative bids.

Our finding that retail investors are favored in more underpriced issues is probably a compensation for the large differences in allocation in general. Although slightly different, our result supports the findings of earlier studies and rejects the winner's curse theory presented by Rock (1986). Furthermore, the underwriter has to compensate retail investors who constantly get exposed to a 15-20% price risk on average since they cannot put a price limit on their order. Since retail investors is an important part of the process in order for the issuer to fulfill the rules of ownership dispersion, excluding them from the gains in hot issues would deteriorate the group and they would withdraw from the market.

Also, by allocating more favorably to retail investors when underpricing is high the underwriter limits the risk of supporting the stock in the aftermarket. Since retail investor behavior are harder to predict they pose a higher risk to the bank of being flippers. In addition, flipping activity is favorable to the bank in a high demand issue since the bank does not have to be on the other side of the transaction and they collect commission fees in the process in accordance with the findings from by Jenkinson and Jones (2004).

6.1 Further Research

After reviewing the Swedish IPO market and process we have some suggestions for further investigation in this rather closed area of research. Due to time constraint, we did not include the oversubscription of the order books. It would be an interesting variable to include since it also pertain information about the premarket demand.

- ✓ Use the oversubscription for each book as a proxy for premarket demand.
- ✓ Is there a relationship between MIDDEV and the institutional book oversubscription?
- ✓ Does the retail demand play any role what so ever in where the price is set?
- ✓ Is it retail or institutional premarket demand that mostly drives the stock price in the aftermarket?

An aspect of the retail part of the IPO is that due to their open order bid process we believe that the only way retail can affect the price is to increase it by showing high demand. This predicament deserves further research which can be done by looking at oversubscription in the retail order book and see its effect on the offer price.

Another development would be to add observations to our sample and see if our results still holds or show even more significance. To our knowledge there has been only one previous

study of allocation in Swedish IPOs (Ljungqvist and Wilhelm (2002)¹⁷. They show an average allocation to institutional investor of 69.6% which is considerably lower than our 92.6%. It would be very interesting to find out why there is such a big difference.

Also, even if it may be impossible to perform, it would be very interesting to follow the behavior of the investors from the different groups in the aftermarket to see who is indeed long term and short term investors. The reason for this is that the allocation decision seems to be based on perceived behavior of the investor. Looking at the Swedish market's allocation patterns, retail investors are a small group if compared to average US retail participation; hence it would be interesting to find information on why the allocation differs.

Our research also shows a lower underpricing on average in the Swedish market than the US market. Is this variation due to the difference in when the sample was selected or is the Swedish IPO method better at finding a true market value of the firm? When discussing price variation in the aftermarket, two more questions comes to mind.

- ✓ To what demand, retail or institutional, is a price appreciation most correlated with?
- ✓ How does this correlation look when the price drops the first day?

¹⁷ Ljungqvist and Wilhelm (2002) research international variation on allocation and use 47 IPOs in the Swedish market between 1990-2000.

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Web resources

EcoWin

E-views

SPSS

<http://www.se.omxgroup.com/index.aspx>

<http://www.fi.se>

<http://www.aktieservice.se/>

IPO database provided by the Stockholm Stock Exchange available upon request

Appendices

In the appendices we will present the results from our regressions along with the tests we have conducted to make sure that they are in line with the assumptions for OLS. Appendix 6 also contains the questionnaire that served as a base in our interviews.

Appendix 1

Variable Explanation

RE_DAY_1	= (price at day one close - offer price)/offer price
MIDDEV	= (offerprice – mean of offerrange)/ mean of offerrange
INSTITUTION	= institutional allocation when orderbook closes
RETAIL	= retail allocation when orderbook closes
LOGPROCEEDS	= log of the proceeds from the issues

$$\text{Return Day One} = \alpha + \beta \text{ Institution} + \varepsilon \quad (1)$$

Dependent Variable: RE_DAY_1

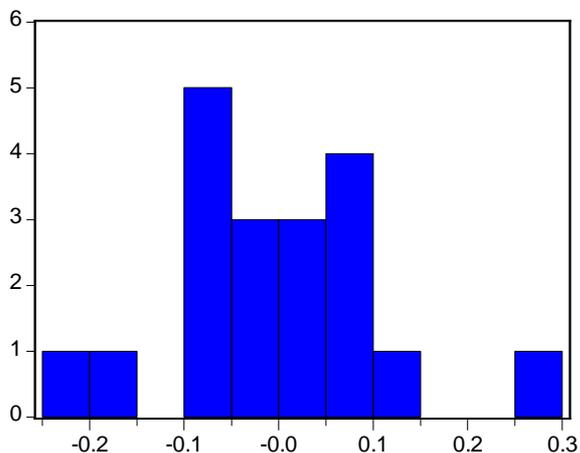
Method: Least Squares

Date: 05/29/06 Time: 13:17

Sample (adjusted): 1 19

Included observations: 19 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INSTITUTION	-1.391285	0.651990	-2.133905	0.0477
C	1.346607	0.604484	2.227698	0.0397
R-squared	0.211267	Mean dependent var		0.057911
Adjusted R-squared	0.164871	S.D. dependent var		0.125100
S.E. of regression	0.114323	Akaike info criterion		-1.400279
Sum squared resid	0.222185	Schwarz criterion		-1.300865
Log likelihood	15.30265	F-statistic		4.553552
Durbin-Watson stat	1.808648	Prob(F-statistic)		0.047714



Series: Residuals	
Sample 1 19	
Observations 19	
Mean	1.61e-16
Median	-0.001404
Maximum	0.277890
Minimum	-0.229233
Std. Dev.	0.111102
Skewness	0.276042
Kurtosis	3.784975
Jarque-Bera	0.729111
Probability	0.694505

White Heteroskedasticity Test:

F-statistic	0.519055	Prob. F(2,16)	0.604767
Obs*R-squared	1.157646	Prob. Chi-Square(2)	0.560558

Ramsey RESET Test:

F-statistic	1.455861	Prob. F(1,16)	0.245128
Log likelihood ratio	1.654649	Prob. Chi-Square(1)	0.198327

	RE_DAY_1	INSTITUTION
RE_DAY_1	1	-0.459637792699047
INSTITUTION	-0.459637792699047	1

Appendix 2

$$\text{Return Day One} = \alpha + \beta \text{Retail} + \varepsilon \quad (2)$$

Dependent Variable: RE_DAY_1

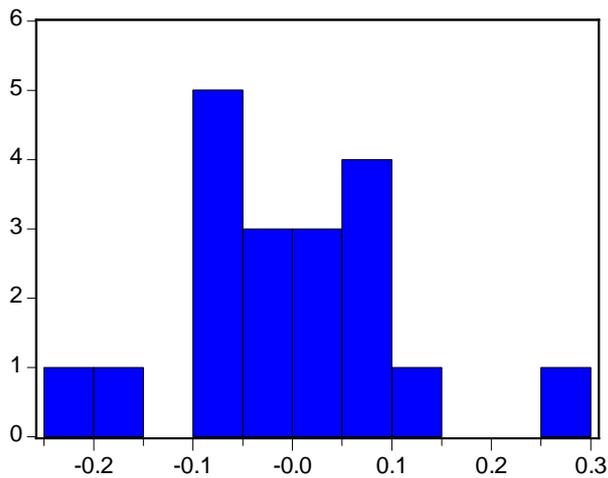
Method: Least Squares

Date: 05/22/06 Time: 10:39

Sample: 1 19

Included observations: 19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
RETAIL	1.391285	0.651990	2.133905	0.0477
C	-0.044678	0.054765	-0.815820	0.4259
R-squared	0.211267	Mean dependent var		0.057911
Adjusted R-squared	0.164871	S.D. dependent var		0.125100
S.E. of regression	0.114323	Akaike info criterion		-1.400279
Sum squared resid	0.222185	Schwarz criterion		-1.300865
Log likelihood	15.30265	F-statistic		4.553552
Durbin-Watson stat	1.808648	Prob(F-statistic)		0.047714



Series: Residuals	
Sample 1 19	
Observations 19	
Mean	-5.11e-18
Median	-0.001404
Maximum	0.277890
Minimum	-0.229233
Std. Dev.	0.111102
Skewness	0.276042
Kurtosis	3.784975
Jarque-Bera	0.729111
Probability	0.694505

White Heteroskedasticity Test:

F-statistic	0.519055	Prob. F(2,16)	0.604767
Obs*R-squared	1.157646	Prob. Chi-Square(2)	0.560558

Ramsey RESET Test:

F-statistic	1.455861	Prob. F(1,16)	0.245128
Log likelihood ratio	1.654649	Prob. Chi-Square(1)	0.198327

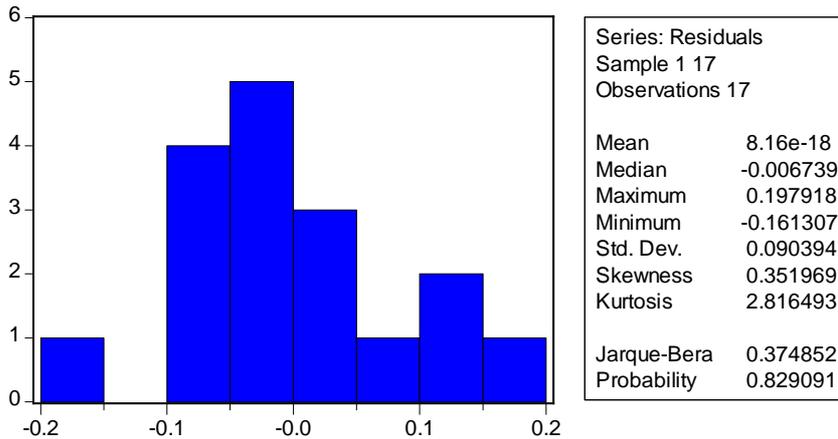
RE_DAY_1	RE_DAY_1	RETAIL
RE_DAY_1	1	0.459637792699047
RETAIL	0.459637792699047	1

Appendix 3

$$\text{Return Day One} = \alpha + \beta \text{MIDDEV} + \varepsilon \quad (3)$$

Dependent Variable: RE_DAY_1
 Method: Least Squares
 Date: 05/19/06 Time: 16:00
 Sample: 1 17
 Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MIDDEV	0.458935	0.238264	1.926166	0.0733
C	0.037412	0.022728	1.646031	0.1205
R-squared	0.198295	Mean dependent var		0.033615
Adjusted R-squared	0.144848	S.D. dependent var		0.100956
S.E. of regression	0.093358	Akaike info criterion		-1.794610
Sum squared resid	0.130737	Schwarz criterion		-1.696585
Log likelihood	17.25419	F-statistic		3.710114
Durbin-Watson stat	1.981783	Prob(F-statistic)		0.073251



White Heteroskedasticity Test:

F-statistic	2.116579	Prob. F(2,14)	0.157349
Obs*R-squared	3.946858	Prob. Chi-Square(2)	0.138980

Ramsey RESET Test:

F-statistic	2.277857	Prob. F(1,14)	0.153468
Log likelihood ratio	2.562723	Prob. Chi-Square(1)	0.109410

RE_DAY_1	1	MIDDEV	0.445302793528603
MIDDEV	0.445302793528603		1

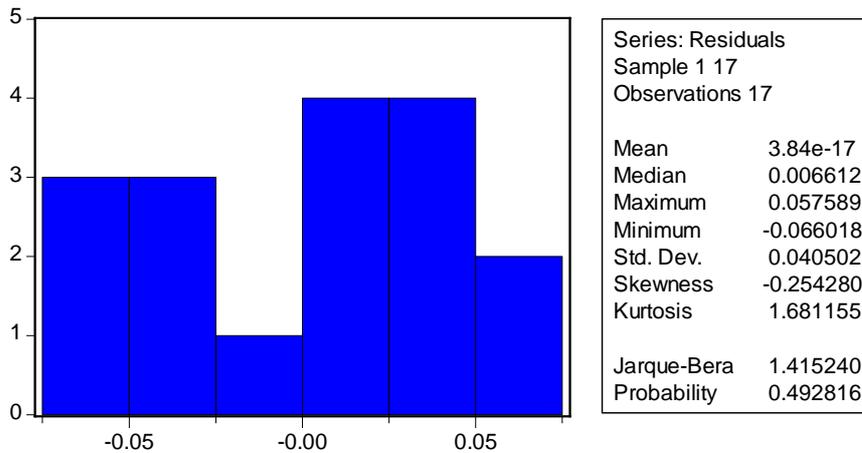
Appendix 4

$$\text{Retail} = \alpha + \beta \text{MIDDEV} + \varepsilon \quad (4)$$

Dependent Variable: RETAIL
 Method: Least Squares
 Date: 05/21/06 Time: 18:30
 Sample: 1 17
 Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MIDDEV	0.155395	0.106758	1.455585	0.1661
C	0.073109	0.010184	7.178966	0.0000

R-squared	0.123767	Mean dependent var	0.071824
Adjusted R-squared	0.065351	S.D. dependent var	0.043268
S.E. of regression	0.041831	Akaike info criterion	-3.400242
Sum squared resid	0.026247	Schwarz criterion	-3.302217
Log likelihood	30.90205	F-statistic	2.118728
Durbin-Watson stat	1.485909	Prob(F-statistic)	0.166117



White Heteroskedasticity Test:

F-statistic	0.149872	Prob. F(2,14)	0.862181
Obs*R-squared	0.356345	Prob. Chi-Square(2)	0.836798

Ramsey RESET Test:

F-statistic	2.214756	Prob. F(1,14)	0.158873
Log likelihood ratio	2.496694	Prob. Chi-Square(1)	0.114086

	RETAIL	MIDDEV
RETAIL	1	0.35180490933533
MIDDEV	0.35180490933533	1

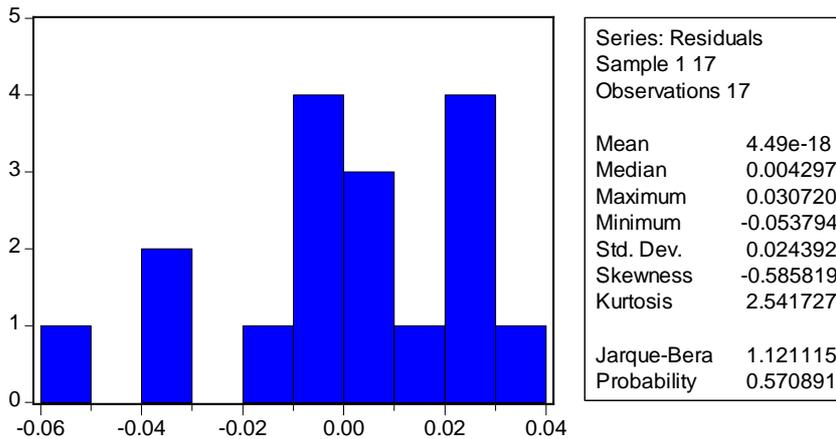
Appendix 5

$$Retail = \alpha + \beta_1 MIDDEV + \beta_2 LOGPROCEEDS + \varepsilon \quad (5)$$

Dependent Variable: RETAIL
 Method: Least Squares
 Date: 05/19/06 Time: 16:28
 Sample: 1 17
 Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGPROCEEDS	-0.034124	0.006880	-4.960051	0.0002
MIDDEV	0.373144	0.079724	4.680422	0.0004
C	0.306360	0.047452	6.456148	0.0000

R-squared	0.682212	Mean dependent var	0.071824
Adjusted R-squared	0.636814	S.D. dependent var	0.043268
S.E. of regression	0.026076	Akaike info criterion	-4.296844
Sum squared resid	0.009519	Schwarz criterion	-4.149806
Log likelihood	39.52317	F-statistic	15.02730
Durbin-Watson stat	1.460974	Prob(F-statistic)	0.000327



White Heteroskedasticity Test:

F-statistic	0.661448	Prob. F(4,12)	0.630507
Obs*R-squared	3.071084	Prob. Chi-Square(4)	0.546001

Ramsey RESET Test:

F-statistic	2.631563	Prob. F(1,13)	0.128748
Log likelihood ratio	3.133827	Prob. Chi-Square(1)	0.076684

	RETAIL	LOGPROCEEDS	MIDDEV
RETAIL	1	-0.430067261099323	0.35180490933533
LOGPROCEEDS	-0.430067261099323	1	0.550653939299584
MIDDEV	0.35180490933533	0.550653939299584	1

Appendix 6

Interview with Investment Bank

1. How many companies have you brought to the market?

The IPO process

2. How do you determine the price range in the offer?

3. What method do you use in the IPO process?

4. What do you consider to be the most crucial part of an IPO process?

Share Allocation

5. How do you allocate shares in the event of over-subscription?

6. What are your major influences when determining allocation in an IPO?

7. Does the nature of the company affect the allocation decision?

8. How influential is the company going public in the allocation process?

9. Are there any rules considering the allocation process?

10. How do you determine the final allocation within the IPO?

11. What are the rules concerning allocation of shares in the event of oversubscription?
- Is the allocation at the investment banks discretion?

Investor Behavior

12. Do you consider institutional investors to be long term?

13. Do you consider private investors to be short term?

14. Do you rank or actively try to target certain institutional investors?

15. Are loyal investors prioritized over the long run in the IPO process?

16. How do you define a successful IPO?