Laddering IPO Shares

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Abstract

Regulators, investors, and the financial media argue that underwriters tie Initial Public Offering (IPO) allocations to investor post-listing purchases in the issuer shares. Using unique data from the Oslo Stock Exchange (OSE) I investigate if these tie-in agreements are driven by price stabilization (reducing price falls below the offer price) or laddering (inflating prices above the offer price). I find that both stabilizing and laddering investors are rewarded with increased allocations for their service. However, only laddering investors increase allocations in very oversubscribed future issues. Secondary investors also lose from falling returns following laddering. I conclude that underwriters use both price stabilization and laddering across different IPOs. However, the rewards for cooperating investors and the economic consequences for secondary investors are much greater following laddering.

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1. Introduction

On April 30, 2001 the Wall Street Journal broke the story that investment banks tie IPO allocations they underwrite to investor post-listing purchases in the IPO share as a condition for receiving allocations.[1] In the wake of this scandal two main views have been proposed to explain why allocations are tied to post-listing purchases. Hao (2007) argue *the laddering hypothesis* where IPO shares are allocated as part of rent-seeking agreements where investors buy more shares to inflate prices so that underwriters can take advantage of higher returns. Chen and Wilhelm (2008) argue the *price stabilization hypothesis* where underwriters tie allocations to investor post-listing purchases to avoid negative price spirals after the new listings.

In this paper I investigate if investor IPO allocations are tied to post-listing purchases because of laddering or price stabilization.

Obtaining data to investigate this research question has in the past proven difficult as the IPO allocation data is generated by the lead underwriter. Given that IPO laddering is illegal the incentives to share data is limited. In Norway companies listing on the OSE are forced as part of the listing process to register all investor shareholdings in the share depository (the OSE VPS). From this data I obtain IPO allocations and post-listing trading for 187,570 investors in 188 IPOs from 1993 to 2007.

My main empirical finding is a strong and robust relation between IPO allocations and investor post-listing purchases in IPOs that increase in price immediately after the listing. Price

[1] See Puliam and Smith (2001) and the SEC (2003), SEC (2005a), and SEC (2005B) litigation releases where J.P. Morgan, Morgan Stanley, and Goldman Sachs settled to pay $25 million, $40 million, and $40 million in penalties, respectively.

stabilization is performed to prevent prices from falling after the listing. Laddering is performed to inflate prices. A relation between allocations and secondary purchases when prices go up is indicative of laddering taking place. I also document that investors who provide laddering are rewarded with more oversubscribed (hot) IPO allocations from the same underwriter in the future. Investors who provide price stabilization are rewarded with more IPO allocations in general (and not hot allocations). This show that both price stabilization and laddering is taking place. However, the reward to involved investors is greater from engaging in illegal laddering.

I then investigate the economic consequences of tying IPO allocations to post-listing purchases. I document that non-allocated secondary investors lose substantially as prices fall in the medium-term after the listing from laddering. I do not find that price stabilization impact on issuer medium term return in the same way.

I conclude that both laddering and price stabilization are taking place on the OSE. However, the incentives for investors are much greater for engaging in laddering due to the stronger rewards. I also conclude that laddering is harmful to secondary investors buying shares immediately after the listing.

I contribute to a growing area of the literature that investigates financial misconduct; see Cumming, Dannhauser, and Johan (2015). Liu and Ritter (2010) explain that there are four main IPO scandals that have received recent attention by academics, regulators, and the financial press. First, Coakley, Hadass, and Wood (2009) and Liu and Ritter (2010) find evidence of shares being allocated to venture capitalists and corporate executives in return for future business (spinning). Second, Cliff and Denis (2004) and Liu and Ritter (2011) find evidence of issuers agreeing to underpricing in return for post-IPO analyst coverage. Third, Reuter (2006), Nimalendran, Ritter,

and Zhang (2007), Goldstein, Irvine and Puckett (2011), and Jenkinson, Jones, and Suntheim (2017) document that IPO allocations are tied to stock-trading commission payments.

In this paper, I investigate a fourth scandal in IPO laddering. I distinguish between Hao (2007) and Chen and Wilhelm (2008) who theoretically investigate legal and illegal price support in IPOs. I document that investors are rewarded with increased current and future oversubscribed IPO allocations if they buy more shares that are eventually sold soon after the listing in IPOs with positive immediate returns. This finding indicates that underwriters allocate shares to investors in return for additional post-listing share purchases as part of rent-seeking agreements (laddering). This finding is important as it shows that regulators should highly limit price support made by allocated investors. Chapter 3 section 12 in the Norwegian Securities Trading Act implements the European Union commission regulation on the stabilization of financial instruments. Price support is legal to prevent or retard a price fall immediately after the listing (stabilization). Price support is illegal to inflate the price (laddering).[2] I show that underwriters violate this rule and that this process is harmful to secondary investors who buy at inflated prices and incur great losses.

The European Union is currently implementing the new Markets in Financial Instruments Directive (the MiFID 2) that also strictly forbids IPO laddering. If the MiFID 2 regulation of price support is to have any effect, it is important to make sure that underwriters also follow these rules. The lack of intervention in the European new issues markets should not be taken as evidence of more truthful dealings.

[2] The regulation is the same in the U.S. under Rule 101 and Rule 104 of Regulation M under the Securities and Exchange Act of 1934.

I also contribute to Rocholl (2009) by further documenting why specific investors obtain underpriced IPO allocations in European IPOs. Rocholl shows that investors can buy hot IPO allocations by also accepting cold allocations in other issues by the same underwriter. I show that investors can buy hot IPO allocations by providing legal or illegal price support for the underwriter.

The remainder of this paper is organized as follows: Section 2 is related literature and hypothesis development. Section 3 and 4 are institutional setup and data. Section 5 is empirical results while section 6 concludes.

2. Related literature and hypothesis development

Hao (2007) and Chen and Wilhelm (2008) investigate the relation between IPO allocations and investor price support theoretically. Hao (2007) argues the *laddering hypothesis* where underwriters tie IPO allocations to investor post-listing purchases with the intention of inflating prices after the listing. Underwriters take advantage of the inflated prices by also allocating shares quid-pro-quo to investors who pay for allocations using stock-trading commissions. In this way underwriters recapture part of the laddering inflated profits through commission payments.

Chen and Wilhelm (2008) argue the *price stabilization hypothesis* where IPO allocations are tied to post-listing purchases to retard price falls after the listing. Some investors will sell their allocation as soon as secondary trading commences. To avoid negative price spirals, it can be advantageous that some investors also buy shares immediately after the listing. Underwriters can then tie IPO allocations to post-listing purchases for some investors to stabilize or retard price falls.

Ellis (2006), Griffin, Harris and Topaloglu (2007), and Fjesme (2016) investigate the relation between IPO allocations and price support empirically. Ellis (2006) document that 22% of the immediate trading volume after IPOs are buy orders through the lead underwriter. This is

taken as evidence of the existence of price support as investors want to show the lead underwriter that the trades are made. Griffin et al. (2007) similarly document that after-listing buy orders in IPOs go through the lead underwriter. Fjesme (2016) documents a relation between post-listing purchases and future oversubscribed IPO allocations on the OSE. Fjesme documents that non-allocated secondary investors misinterpret the post-listing buying as positive information and thereby increase holdings that eventually leads to huge losses. Fjesme (2018) document that price support is more often used when shares are allocated to high stock-trading commission investors.

In this paper, I contribute by distinguishing between the different types of price support. I also investigate the difference in usage and the economic consequence of price stabilization and laddering. This is an important contribution to the literature as stabilization is legal and presumably helpful, whereas laddering is illegal and presumably harmful.

Based on Zhang (2004), Griffin et al. (2007), and Chen and Wilhelm (2008) I investigate price support as secondary purchases by large allocated short-term investors. Zhang (2004) explain that some investors are allocated fewer shares than they apply for in the IPO. This rationing means that some allocated investors will buy additional shares after the listing to reach optimal holding levels for the long-run. Price support investors, on the other hand, buy more shares as a condition for receiving allocations at the offer price; see Hao (2007) and Chen and Wilhelm (2008). Price support investors are therefore likely to be short-term investors as they will eventually offload unwanted holdings. I therefore investigate price support as only short-term investors. Griffin et al. (2007) and Chen and Wilhelm (2008) argue that price support is likely to be performed by a small number of large investors to economize on monitoring costs. I therefore investigate price support as only investors with large portfolio values.

Chapter 3 section 12 in the Norwegian Securities Trading Act implements the European Union commission regulation on the stabilization of financial instruments. Under this act laddering is defined as price support in IPOs that increase in price after the listing. Price stabilization is defined as price support in IPOs that decrease in price after the listing. I follow these regulations, Hao (2007), and Chen and Wilhelm (2008) and distinguish between laddering and stabilization as issues that increase and decrease in price immediately after the listing, respectively.

It is possible that both laddering, and price stabilization is used interchangeably across different IPOs by the same underwriters. Based on Zhang (2004), Griffin et al. (2007), Hao (2007), and Chen and Wilhelm (2008) I investigate if there is a relation between IPO allocations and laddering and price stabilization. I formalize this as Hypothesis H1a and H1b.

Hypothesis 1a: There is a positive relation between laddering (price support in IPOs that increase in price immediately after the listing) and current IPO allocations.

Hypothesis 1b: There is a positive relation between price stabilization (price support in IPOs that decrease in price immediately after the listing) and current IPO allocations.

Investors are willing to provide price support in return for current IPO allocations; see Hao (2007). However, to make sure that investors follow through it is likely that price support is also tied to future allocations. Those investors who provide price support in some IPOs are likely to be rewarded for this service with allocations in future issues. If laddering and stabilization takes place, there should arguably be a positive relation between past levels of laddering and stabilization and future allocations in issues by the same underwriter. I formalize this as hypotheses H2a and H2b.

Hypothesis 2a: There is a positive relation between past levels of laddering and future IPO allocations by the same underwriter.

Hypothesis 2b: There is a positive relation between past levels of price stabilization and future IPO allocations by the same underwriter.

Fjesme (2016) documents that price support reduces issuer medium-term return as support investors offload unwanted shares. Hao (2007) argues that underwriters can use laddering to easier exchange IPO allocations quid pro quo with investor stock-trading commissions. When the quid pro quo transactions are completed, and high commission investors have realized their profit, laddering investors will arguably offload unwanted shares. The offloading of unwanted shares will arguably lead to lower issuer returns in the medium term after the listing.

Chen and Wilhelm (2008) argue that underwriters use stabilization to avoid negative price spirals after new listings. In price stabilization the underwriter will control the offloading of shares to avoid price falls. However, as demand is reduced it is possible that prices will fall in the medium term also following price stabilization. I formalize this as Hypothesis H3a and H3b.

Hypothesis 3a: IPOs with laddering have lower holding period excess returns than other IPOs in the medium-term after the listing.

Hypothesis 3b: IPOs with price stabilization have lower holding period excess returns than other IPOs in the medium-term after the listing.

3. Institutional setup

The OSE is similar to the U.S. and the other European exchanges as it is regulated under the European Union regulation of market instruments.[3] Underwriters price and allocate shares using book-building and underpricing and issue sizes are commensurate with other exchanges; see Fjesme (2016). The market for underwriters is very competitive with 32 different underwriters in the sample of 188 issues. The market for underwriter services is very international in nature and all the underwriters that were sued by the SEC over laddering allegations in the U.S. act as co-managers on the OSE during the sample period; see SEC (2003), SEC (2005a), and SEC (2005b).

However, there are two key differences in the institutional setup on the OSE that allows me to observe IPO allocations. IPO allocation data is in general hard to obtain at other exchanges as it is generated by the lead underwriters. Firstly, companies listing on the OSE often allocate IPO shares to investors weeks before secondary trading commences. Companies listing on the U.S. exchanges usually allocate shares on (or close to) the day of the listing. Secondly, companies listing on the OSE must as part of the listing process register investor share holdings into the OSE VPS database (the share depositary). Using these key data distinctions, I observe who buys IPO shares and who buy shares after the listing in the OSE VPS database.

Chapter 3 section 12 in the Norwegian Securities Trading Act implements the European Union regulation on the stabilization of financial instruments. Price stabilization is legal on the OSE to prevent or retard a price fall immediately after the listing. IPO laddering is illegal to inflate the price.

[3] See the OSE market description at the Oslo Stock Exchange homepage https://www.oslobors.no/ob_eng/

4. Data

4.1 IPO allocations

From the OSE VPS I identify who hold shares in each company at the end of each calendar month from January 1993 to September 2007. Some companies list into the OSE VPS database many years before they formally list for public trading. Other companies list into the database in the same week as public trading commences.

In total, 35 companies list into the OSE VPS and allocate IPO shares to investors in a calendar month before secondary trading starts. In these 35 issues I completely discriminate between allocated and secondary investors. Table Appendix 1 show an example of an IPO timeline provided in one of these 35 listing prospectuses. In this company investors are invited to apply for shares between November 26 and December 10, 1993. Allocation notifications are sent to applicants on December 17 with payment due by December 23. Registration of new shares are made in the OSE VPS on December 30. The company is then listed on the stock exchange on January 10, 1994. In this company I classify IPO allocations as those investors that held shares at the end of December 1993 and did not hold shares at the end of November 1993. I observe secondary purchases as new shares in January 1994 (and separately in February 1994). In this company I completely discriminate between allocated and secondary share purchases.

In another 153 IPOs the issuer allocates shares in the same calendar month as secondary trading commences. In these 153 IPOs I estimate allocations as those investors who hold shares at the end of the listing month but did not hold shares at the end of the calendar month before the listing month. This means that for these 153 companies the observed IPO allocations are contaminated by some post-listing trading. I observe secondary purchases as new shares in the month following the listing month.

There is a total of 251 new listings on the OSE over the sample period. In total, 63 of these new listings are either cross-listings (not IPOs), straight listings with no equity issued (not IPOs), or listings in the OSE VPS database in the actual listing month (so IPO allocations are unobservable).[4] This gives me a final sample of 188 IPOs with allocations. When possible, I show the results for both the sample of 35 IPOs with exact data and the sample of all 188 IPOs. Table 1 shows the IPOs per year for the sample period January 1993 to September 2007.

4.2 Variable descriptions

IPO allocation is the number of allocated shares to each investor in percent of the IPO issued shares. *Past pair* is a binary variable that takes the value of one (otherwise zero) for investors who have received allocations from the same underwriter in the past. *Portfolio* is the investor portfolio value on the OSE at 31.12.xx in the year before the IPO. *Support* is the percent of the IPO issue that is purchased by large allocated investors in the first month after the listing before being sold within six months. I define large investors as those investors with a portfolio value bigger than

[4] Straight listings are usually performed by older and larger corporations who already meet listing requirements in terms of minimum number of investors owning shares and minimum levels of equity in the company. These straight listings are therefore not IPOs as they do not sell any (new or existing) shares. For companies that list into the VPS database and onto the OSE in the same calendar month I cannot distinguish between existing pre-IPO investors and IPO allocated investors. These companies are therefore not included in the sample as I cannot observe IPO allocations.

$100,000 (the 80th percentile) at the beginning of the calendar year. *Commission* is the monthly portfolio turnover in the 24 months prior to the IPO allocation times the market share price and a fixed rate of 0.075%. The fixed rate of 0.075% is the average used by the 15 biggest stock-trading platforms in Norway during the sample period. Only buy-generated commission is included to avoid situations where investors make room for more shares in their portfolios. The minimum commission for one transaction is $15.

BV/MV is the book value of equity divided by the market value of equity. *First day return* is the percentage change from the IPO offer price to the first day closing price. *HPER 3 month* and *HPER 6 month* are the holding period returns of the issuers in excess of the main market return (the OBX) in the first three and six months after the listing, respectively. I follow Boyer and Stern (2014) by calculating HPERs as the issuer return minus the main market index return. *Total Support* is the cumulated *Support* per IPO.

Offer size is calculated as: (the number of issued shares in the IPO) / (the number of outstanding shares in the company). *Tech* is a binary variable that takes the value of one (otherwise zero) for issuers in the technology sector. *Time gap* is the difference between the IPO allocation date and the listing date in months. *Top tier manager* is a binary variable that takes the value of one (otherwise zero) for issuers taken public by lead underwriters ranked in the eight highest out of all 32 possible based on issuer market capitalization; see Megginson and Weiss (1991). *VC* is a binary variable that takes the value of one (otherwise zero) for issuers with venture capital backing.

4.3 Descriptive statistics

Table 2 Panel A gives descriptive statistics at the investor level for the sample of 187,570 investors in the all 188 IPOs sample. The average investor is allocated 0.065% of the IPO issue (*IPO*

allocation). The average *Support* is 0.002% of the IPO issue immediately after the listing. The average investor generates $9,851 USD in stock-trading commission in the 24-month period before the IPO from a portfolio value of $5.4 million USD. The high average *Commission* and *Portfolio* are driven by a small number of very large investors. On average 10.2% of investors have received an allocation from the same lead underwriter in the past (*Past pair*). Table 2 Panel B shows that the variables are very similar for the 26,858 investors in the 35 IPOs with exact data on IPO allocations.

Table 3 Panel A show descriptive statistics at the company level for the all 188 IPO sample. The average IPO have a *First day return*, *HPER 3 month*, and *HPER 6 month* of 10%, 11%, and 13.8%, respectively. On average price support investors buy in total 2.3% of the IPO issued shares immediately after the listing before selling all shares within six months of the listing date (*Total support*).

The average company has a market value of $331 million (*MV)* and a book to market ratio of 0.59 (*BV/MV*). On average 14.9%, 53.7%, and 17.6% of the issuers have *VC* backing, a *Top tier manager*, and are in the *Tech* industry, respectively. The average offer size is 35% of outstanding shares. Table 3 Panel B shows that the company level variables are very similar for the 35 issuers with exact data on IPO allocations.

5. Empirical results

5.1 Price support and current IPO allocations

Hypothesis 1a predicts that there is a positive relation between laddering (price support in IPOs that increase in price immediately after the listing) and current IPO allocations. In Table 4 I regress Ln (*IPO allocation*) on *Support*, the interaction terms (*Support * Price increase*), and controls in

a standard OLS model for the 187,570 investors in the 188 IPOs with data on allocations using equation [1] for each investor (i) in each IPO (j).

[1] $Ln\ (IPO\ allocation_{ij}) = \alpha + \beta_1[Support_{ij}] + \beta_2[Support_{ij} * Price\ increase_j] + \beta_3[Price\ increase_j] + \beta_4[Commission_{ij}] + \beta_5[Log(1+Portfolio_{ij})] + \beta_6[Past\ pair_{ij}] + \beta_7[MV_j] + \beta_8[BV/MV_j] + \beta_9[VC_j] + \beta_{10}[Top\ tier\ manager_j] + \beta_{11}[Tech_j] + \beta_{12}[Offer\ size_j] + \beta_{13}[Time\ gap_j] + Year\ Fixed\ Effects + e_{it}$

IPO allocation is the number of allocated shares to each investor in percent of the IPO issued shares. *Support* is the percent of the IPO issue that is purchased by large allocated investors in the first month after the listing before being sold within six months. *Price increase* takes the value of one (otherwise zero) for IPOs with a *First day return* greater than (the mean level + one-standard-deviation).

From Column 1 in Table 4 we see that here is a positive relation between *IPO allocation* and both *Support* and (*Support* * *Price increase*). The interpretation is that investors in IPOs with *Price increase* = 1 who increase *Support* by one-standard-deviation will increase *IPO allocation* by 16.7% [(0.24 + 1.16) * 0.119 * 100]. This is much higher than investors in IPOs with *Price increase* = 0 who increase *Support* by one-standard-deviation and enhance *allocation* by 2.9% (0.24 * 0.119 * 100). This indicates that there is a high reward for supporting IPOs that increase in price immediately after the listing (laddering).

Hypothesis 1b predicts that there is a positive relation between price stabilization (price support in IPOs that decrease in price immediately after the listing) and current IPO allocations. In Column 2 I regress Ln (*IPO allocation*) on *Support*, the interaction terms (*Support* * *Price*

decrease), and controls in a standard OLS model for the 187,570 investors in the 188 IPOs. *Price decrease* takes the value of one (otherwise zero) for IPOs with a *First day return* below (the mean level minus one-standard-deviation). From Column 2 we see that there is a positive relation between *IPO allocation* and *Support* and (*Support * Price decrease*). The interpretation is that investors in issues with *Price decrease* = 1 who increase *Support* by one-standard-deviation will increase *IPO allocation* by 14.5% [(0.25 + 0.97) * 0.119 * 100].

Laddering and price stabilization both take place across different IPOs at the same time. To account for this, I include both interaction terms (*Support * Price increase*) and (*Support * Price decrease*) in Column 3 of Table 4.[5] The results remain unchanged. I conclude that the results are not driven by omitted laddering or stabilization from the analysis.

Bubna and Prabhala (2011) and Bakke, Leite and Thorburn (2017) documents how underwriters use publicly available information in addition to information from investors when pricing and allocating IPO shares. Investors who help with pricing are rewarded with increased allocations for this service. I cannot observe if underwriters meet with investors and this can lead to an unobserved variable bias in the regression. To account for this, I proxy for information collected from investors by including the investor portfolio value (*Portfolio*) and past interactions between investors and underwrites (*Past pair*) in all regressions. Arguably underwriters meet with the same large investors over time to set the price in the IPO. Jenkinson, Jones, and Suntheim (2017) also document that investors are rewarded with increased IPO allocations from providing

[5] The IPOs that neither increase or decrease substantially in price after the listing are the omitted category.

increased stock-trading commission payments. To account for this, I include the investors stock-trading commission as a control in all regressions (*Commission*).

Increasing *Portfolio* by 1% is associated with an increase in *IPO allocation* by 4.3%. Increasing *Past pair* from zero to one is associated with increasing *IPO allocation* by 51% (0.51 * 1 * 100). Increasing *Commission* by one-standard-deviation is associated with increasing *IPO allocation* by 15.4% (1.16 * 0.133 * 100). These findings suggests that large investors who generate big stock-trading commission and interact with the same underwriters over time are also favored with increased IPO allocations. I additionally control for company specific variables (*MV, BV/MV, VC, Top tier manager, Tech, Offer size*) and year fixed effects. Because there are some differences in the timing between allocation and listing in the sample I also include the variable *Time gap* in all regressions. *Time gap* is defined as the difference between the IPO allocation date and the listing date in months.

Griffin et al. (2007) show that price support may go on for as long as three weeks after the listing. In the main analysis *Price increase* (*Price decrease*) takes the value of one for IPOs with a *First day return* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). In Column 4 *Price increase* (*Price decrease*) takes the value of one for IPOs with a *3-week HPER* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). From Column 4 we see that the results are now slightly stronger.

It could also be argued that it is difficult to define large investors. Griffin et al. (2007) argue that price support is likely to be performed by a small number of investors to economize on monitoring costs. In the main analysis I define large investors as those who are in the top 20% on portfolio value (more than $100,000). In Column 5 of Table 4 I define large investors as those with positive portfolio values. The results remain unchanged.

Finally, it could be argued that underwriters will only tie allocations to price support in IPOs with very strong demand (laddering) or very weak demand (price stabilization). In Column 6 of Table 4 I account for this possibility by measuring *Price increase* (*Price decrease*) as the variable that takes the value of one for IPOs with an *Oversubscription* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). Arguably IPOs with very high (low) oversubscription are more likely to be used in laddering (price stabilization).[6] The results remain unchanged. I conclude that the results are robust to how I specify the control variables.

In Table 5 I show the same results when investigating the sample of 26,858 investors in the 35 IPO sample with exact data on allocation. All conclusions remain the same. Now, however, the economic magnitudes in the relations between *IPO allocation*, *Support*, *Portfolio*, and *Past pair* are much greater. Investors in issues with *Price increase* = 1 who increase *Support* by one-standard-deviation will increase *IPO allocation* by 28.56% [(0.07 + 1.64) * 0.167 * 100]. Investors in issues with *Price decrease* = 1 who increase *Support* by one-standard-deviation will increase *IPO allocation* by much more at 195.6% [(0.07 + 11.64) * 0.167 * 100].

These results are consistent with Hypothesis 1a and Hypothesis 1b which predicts that there is a positive relation between IPO allocations and price support in IPOs that increase and decrease in price immediately after the listing. The results are consistent with the view that underwriters use both price stabilization and laddering in IPOs.

[6] Oversubscription is the total number of applied-for shares divided by the total number of issued shares in the IPO. Underwriters voluntarily report subscription numbers in the newspapers in the weeks following the listing. I assume that the 82 issues that are not reported in the newspapers after the listing were not oversubscribed.

5.3 Past price support and future IPO allocations

Hypothesis 2a predicts that there is a positive relation between past levels of laddering and future IPO allocations by the same underwriter. In Table 6 I regress Ln (*IPO allocation*) on *Past laddering* and the interaction term (*Past laddering* * *Oversubscribed*), and controls in a standard OLS model for the 187,570 investors in the all 188 IPOs sample using equations [2] for each investor (i) in each IPO (j).

[2] $Ln\ (IPO\ allocation_{ij}) = \alpha + \beta_1[Past\ laddering_{ij}] + \beta_2[Past\ laddering_{ij} * Oversubscribed_j] + \beta_3[Oversubscribed_j] + \beta_4[Commission_{ij}] + \beta_5[Log(1+Portfolio_{ij})] + \beta_6[Past\ pair_{ij}] + \beta_7[MV_j] + \beta_8[BV/MV_j] + \beta_9[VC_j] + \beta_{10}[Top\ tier\ manager_j] + \beta_{11}[Tech_j] + \beta_{12}[Offer\ size_j] + \beta_{13}[Time\ gap_j] + Year\ Fixed\ Effects + e_{it}$

I define *Past laddering* as the cumulative number of times an allocated *Large investor* has purchased more shares immediately after the listing in IPOs with *Price increase* = 1 before selling all shares within six months divided by the cumulative number of times the investors have participated in IPOs by the same underwriter. I define *Past stabilization* as the cumulative number of times an allocated *Large investor* has purchased more shares immediately after the listing in IPOs *Price decrease* = 1 before selling all shares within six months divided by the cumulative number of times the investors have participated in IPOs by the same underwriter.[7] *Oversubscribed*

[7] *Price increase* (*Price decrease*) takes the value of one (otherwise zero) for IPOs with a First day return greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation).

is the binary variable that takes the value of one for issues with an oversubscription greater than the mean level + one standard deviation.

From Table 5 Column 1 we see that there is a positive relation between Ln(*IPO allocation*) and *Past laddering* and the interaction term (*Past laddering * Oversubscribed*). The interpretation is that increasing *Past laddering* from zero to one is associated with an increase in *IPO allocation* that are oversubscribed by more than 8.7 times (the mean level + one-standard-deviation) of 278% [(1 * (0.97 + 1.81) * 100)]. Investors who are always laddering will increase *Oversubscribed* IPO allocations by 278% as compared to investors who are never laddering.

In Column 2 I show that there is also a positive relation between Ln (*IPO allocation*) and *Past stabilization* (Hypothesis 2b). However, the interaction term (*Past stabilization * Oversubscribed*) is not statistically related to *IPO allocation*. The interpretation is that increasing *Past stabilization* from zero to one is associated with an increase in *IPO allocation* of 343% (1 * 3.43 * 100). However, the increase is in general allocations and not in IPOs that are very popular (oversubscribed) issues. In Column 3 I show the same results when including all variables together rather than investigating laddering and price stabilization separately. I conclude that the results are not driven by omitting laddering or stabilization from the analysis.

In Columns 4 and 5 I show that increasing *Past laddering* from zero to one in IPOs that are oversubscribed by more than 3.37 times (the mean level) and 13.99 times (the mean level + two-standard-deviations) are associated with an increase in *IPO allocation* of 252% and 284% [(1 * (1.06 + 1.46) * 100)], [(1 * (1.07 + 1.77) * 100)], respectively. The relation remains the same between *IPO allocation* and *Past stabilization*.

I interpret this to mean that there is a reward in future allocations for providing price stabilization. This reward is, however, restricted to general allocations. In the more popular

(oversubscribed) allocations past laddering is more beneficial. These findings are consistent with Hypothesis 2 which predicts a positive relation between past levels of laddering and price stabilization and future IPO allocations by the same underwriter.

I conclude that there is a positive relation between past levels of short-term buying and future allocations of shares by the same underwriters. However, past laddering has a stronger effect on allocations when there are more people competing for shares.

5.3 The consequence of IPO price support

Hypothesis 3 predicts that *IPOs* with laddering and price stabilization have lower holding period excess returns than other IPOs in the medium-term after the listing. In Column 1 of Table 7 I regress the *HPER 3 month* on *Total support,* the interaction term (*Total support * Price increase*), and controls for all 188 IPOs in a standard OLS model. *HPER 3 month* is the holding period return of the issuer in excess of the market return (the OBX) in the first three months after the listing. *Total support* is the cumulated *Support* per IPO.

There is a negative relation between *HPER 3 month, Total support* and the interaction term (*Total support * Price increase*). The interpretation is that increasing *Total support* by one-standard-deviation in IPOs with *Price increase* = 1 is associated with a reduction in *HPER 3 month* of -22.95% [(-4.5) * 5.1]. This is economically significant given that the average *HPER 3 month* is 11%. Increasing *Total support* by one-standard-deviation in IPOs with *Price increase* = 0 is associated with a much lower decrease in *HPER 3 month* by -2.6% (-0.5 * 5.1).

In Column 2 I interact *Total support* by *Price decrease*. The relation between *HPER 3 month* and the interaction term (*Total support * Price decrease*) is not statistically significant. In

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Table 1

The Number of IPOs

Table 1 shows the number of IPOs with shareholdings data per year over the sample period January 1993 to September 2007.

Year	IPOs
1993	6
1994	16
1995	12
1996	13
1997	27
1998	15
1999	3
2000	13
2001	6
2002	2
2003	
2004	13
2005	33
2006	20
2007	9
Total	188

Table 2

Investor Descriptive Statistics

Table 2 shows descriptive statistics at the investor level. Panel A includes all the 188 IPOs with data on IPO allocations. Panel B includes only the 35 IPOs with exact IPO allocation data. All variables are defined in Table Appendix A2.

Panel A: All IPOs

Variable	Obs	Mean	Median	Std.Dev.	Min	Max
IPO allocation	187,570	0.0646	0.0040	0.2667	0.0000	2.1847
Support	187,570	0.0023	0.0000	0.1193	0.0000	23.9217
Commission	187,570	0.0099	0.0000	0.1334	0.0000	10.1550
Portfolio	187,570	0.0054	0.0000	0.0991	0.0000	17.9551
Past pair	187,570	0.1016	0.0000	0.3021	0.0000	1.0000
Past laddering	187,570	0.0002	0.0000	0.0132	0.0000	1.0000
Past stabilization	187,570	0.0001	0.0000	0.0079	0.0000	1.0000

Panel B: Only IPOs with exact allocations

Variable	Obs	Mean	Median	Std.Dev.	Min	Max
IPO allocation	26,858	0.0875	0.0134	0.2877	0.0000	2.1847
Support	26,858	0.0030	0.0000	0.1674	0.0000	23.9217
Commission	26,858	0.0086	0.0000	0.1116	0.0000	6.9476
Portfolio	26,858	0.0033	0.0000	0.0541	0.0000	4.1909
Past pair	26,858	0.0698	0.0000	0.2548	0.0000	1.0000

Table 3

Company Descriptive Statistics

Table 3 shows descriptive statistics at the company level. Panel A includes all the 188 IPOs with data on IPO allocations. Panel B includes only the 35 IPOs with exact IPO allocation data. All variables are defined in Table Appendix A2.

Panel A: All IPOs

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
HPER 3 month	188	11.0352	5.8187	42.5596	-105.5394	217.8678
HPER 6 month	188	13.8389	7.3654	64.2271	-142.5732	370.2356
Total support	188	2.2652	0.5540	5.0764	0.0000	37.3285
MV	188	0.3306	0.1170	0.8790	0.0062	10.6701
BV/MV	188	0.5902	0.4187	0.7454	0.0000	5.6233
VC	188	0.1489	0.0000	0.3570	0.0000	1.0000
Top tier manager	188	0.5372	1.0000	0.4999	0.0000	1.0000
Tech	188	0.1755	0.0000	0.3814	0.0000	1.0000
Offer size	188	0.3503	0.2921	0.2713	0.0003	1.0000
Time gap	188	0.6809	0.0000	1.0818	0.0000	6.0000
First day return	188	0.0997	0.0366	0.2526	-0.3421	2.0000
Oversubscription	188	3.3447	1.0000	5.3087	0.4837	40.0000

Panel B: Only IPOs with exact allocations

Variable	Obs	Mean	Median	Std. Dev.	Min	Max
HPER 3 month	35	14.5527	11.2466	51.4293	-48.9221	217.8678
HPER 6 month	35	13.4476	15.5759	54.0893	-142.5732	207.6033
Total support	35	2.3031	0.0216	6.0915	0.0000	33.6172
MV	35	0.2360	0.1460	0.3237	0.0091	1.8217
BV/MV	35	0.8153	0.4576	1.2867	0.0000	5.6233
VC	35	0.0571	0.0000	0.2355	0.0000	1.0000
Top tier manager	35	0.3429	0.0000	0.4816	0.0000	1.0000
Tech	35	0.2000	0.0000	0.4058	0.0000	1.0000
Offer size	35	0.4235	0.3100	0.3456	0.0166	1.0000
Time gap	35	1.6286	1.0000	1.0025	1.0000	5.0000
First day return	35	0.2075	0.0926	0.4642	-0.3143	2.0000
Oversubscription	35	1.7519	1.0000	2.1643	0.7167	11.0000

Table 4
Price Support and Current IPO Allocations

Table 4 reports intercept coefficients and robust t-statistics in parentheses for standard OLS regressions of Ln (*IPO allocation*) on *Support* and controls. All variables are defined in Table Appendix A2. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively. In Columns 1, 2, and 3 *Price increase* (*Price decrease*) takes the value of one for IPOs with a *First day return* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). In Column 4 *Price increase* (*Price decrease*) takes the value of one for IPOs with a *3-week HPER* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). In Column 5 *Large investor*s are those with a portfolio value bigger than zero. In Column 6 *Price increase* (*Price decrease*) takes the value of one for IPOs with an *Oversubscription* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). All the 188 IPOs with allocation data are included in the analysis.

	Ln (IPO allocation)					
	1	2	3	4	5	6
Support	0.24***	0.25***	0.23***	0.22***	0.26***	0.21***
	(3.2)	(3.2)	(3.2)	(3.2)	(3.4)	(3.2)
Support * Price increase	1.16***		1.16***	1.26***	1.14***	1.21***
	(3.3)		(3.3)	(3.6)	(3.9)	(3.3)
Price increase	-0.20***		-0.19***	-0.44***	-0.19***	-0.59***
	(-13.9)		(-13.3)	(-31.6)	(-13.5)	(-42.9)
Support * Price decrease		0.97**	0.98**	1.41**	0.82***	1.32***
		(2.1)	(2.1)	(2.1)	(2.9)	(3.5)
Price decrease		0.22***	0.19***	-0.02	0.19***	-0.40***
		(5.6)	(4.7)	(-0.9)	(4.6)	(-11.9)
Commission	1.16***	1.16***	1.16***	1.15***	1.16***	1.14***
	(10.7)	(10.7)	(10.7)	(10.7)	(10.7)	(10.6)
Log (1+Portfolio)	4.31***	4.31***	4.31***	4.31***	4.31***	4.31***
	(15.5)	(15.5)	(15.5)	(15.6)	(15.6)	(15.6)
Past pair	0.50***	0.50***	0.51***	0.51***	0.51***	0.50***

	(32.1)	(32.1)	(32.2)	(32.4)	(32.3)	(32.3)
MV	-0.62***	-0.62***	-0.62***	-0.63***	-0.62***	-0.57***
	(-205.7)	(-205.1)	(-204.0)	(-206.4)	(-204.1)	(-170.1)
BV/MV	0.50***	0.51***	0.50***	0.52***	0.50***	0.46***
	(66.5)	(70.3)	(66.6)	(67.5)	(66.5)	(62.0)
VC	0.83***	0.82***	0.83***	0.77***	0.83***	0.69***
	(38.4)	(38.2)	(38.7)	(34.7)	(38.7)	(31.2)
Top tier manager	-0.28***	-0.30***	-0.28***	-0.32***	-0.28***	-0.24***
	(-22.2)	(-23.9)	(-22.1)	(-25.0)	(-22.0)	(-18.5)
Tech	0.95***	0.90***	0.94***	1.03***	0.94***	0.98***
	(58.3)	(55.7)	(56.8)	(63.0)	(56.8)	(60.3)
Offer size	-3.23***	-3.24***	-3.23***	-3.29***	-3.23***	-3.11***
	(-148.9)	(-148.7)	(-148.7)	(-149.6)	(-148.7)	(-141.4)
Time gap	0.27***	0.27***	0.27***	0.27***	0.27***	0.24***
	(44.0)	(43.3)	(44.3)	(44.5)	(44.2)	(39.8)
Constant	-3.93***	-3.98***	-3.97***	-3.78***	-3.97***	-3.97***
	(-104.7)	(-103.4)	(-102.6)	(-101.9)	(-102.6)	(-105.8)
N	187,570	187,570	187,570	187,570	187,570	187,570
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	69.4%	69.4%	69.4%	69.5%	69.4%	69.7%

Table 5
Price Support and Current IPO Allocations

Table 5 reports intercept coefficients and robust t-statistics in parentheses for standard OLS regressions of Ln (*IPO allocation*) on *Support* and controls. All variables are defined in Table Appendix A2. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively. In Columns 1, 2, and 3 *Price increase* (*Price decrease*) takes the value of one for IPOs with a *First day return* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). In Column 4 *Price increase* (*Price decrease*) takes the value of one for IPOs with a *3-week HPER* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). In Column 5 *Large investor*s are those with a portfolio value bigger than zero. In Column 6 *Price increase* (*Price decrease*) takes the value of one for IPOs with an *Oversubscription* greater (lower) than the mean + one-standard-deviation (the mean - one-standard-deviation). Only the 35 IPOs with exact allocations are included in the analysis.

	Ln (IPO allocation)					
	1	2	3	4	5	6
Support	0.07**	0.07**	0.07***	0.06**	0.09***	0.07**
	(2.5)	(2.5)	(2.6)	(2.4)	(2.9)	(2.5)
Support * Price increase	1.65***		1.64***	1.80***	1.11***	1.68***
	(4.3)		(4.3)	(3.7)	(2.8)	(4.3)
Price increase	0.41***		0.39***	0.31***	0.39***	0.21***
	(7.5)		(7.1)	(9.7)	(7.1)	(4.3)
Support * Price decrease		11.63***	11.64***	5.08**	0.98**	11.89***
		(6.4)	(6.4)	(2.3)	(2.0)	(6.4)
Price decrease		1.00***	0.96***	-0.85***	0.97***	0.67***
		(8.0)	(7.7)	(-11.9)	(7.8)	(5.6)
Commission	1.09***	1.05***	1.07***	1.09***	1.05***	1.07***
	(6.2)	(6.2)	(6.2)	(6.2)	(6.2)	(6.2)
Log (1+Portfolio)	5.41***	5.45***	5.40***	5.33***	5.43***	5.40***
	(8.8)	(9.0)	(8.9)	(8.7)	(9.0)	(8.9)
Past pair	0.59***	0.56***	0.58***	0.59***	0.58***	0.57***

	(12.3)	(11.8)	(12.3)	(12.4)	(12.2)	(12.0)
MV	-1.20***	-1.60***	-1.30***	-1.07***	-1.30***	-1.44***
	(-14.0)	(-22.0)	(-15.6)	(-12.5)	(-15.6)	(-17.0)
BV/MV	0.30***	0.24***	0.26***	0.27***	0.26***	0.26***
	(18.4)	(14.5)	(15.7)	(17.0)	(15.6)	(14.6)
VC	1.29***	0.79***	0.92***	1.78***	0.92***	0.94***
	(14.8)	(7.6)	(9.1)	(16.5)	(9.1)	(8.6)
Top tier manager	-0.07	0.20***	0.12**	-0.10**	0.12**	0.11*
	(-1.4)	(3.6)	(2.1)	(-2.0)	(2.1)	(1.9)
Tech	0.15***	-0.26***	-0.27***	0.56***	-0.27***	-0.10
	(2.8)	(-3.2)	(-3.5)	(8.1)	(-3.5)	(-1.3)
Offer size	-1.01***	-1.23***	-0.96***	-1.14***	-0.95***	-1.08***
	(-12.7)	(-18.3)	(-12.0)	(-17.1)	(-11.9)	(-13.6)
Time gap	0.33***	0.52***	0.41***	0.18***	0.41***	0.48***
	(5.7)	(10.1)	(7.6)	(3.1)	(7.6)	(8.2)
Constant	-5.70***	-5.65***	-5.72***	-5.82***	-5.72***	-5.70***
	(-88.6)	(-87.3)	(-90.8)	(-79.3)	(-91.0)	(-83.2)
N	26,858	26,858	26,858	26,858	26,858	26,858
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	28.5%	28.5%	28.8%	29.0%	28.8%	28.5%

Table 6
Price Support and Future IPO Allocations

Table 6 reports intercept coefficients and robust t-statistics in parentheses for standard OLS regressions of Ln (*IPO allocation*) on *Past laddering*, *Past stabilization*, and controls. All variables are defined in Table Appendix A2. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively. *Oversubscribed* takes the value of one (otherwise zero) for issues that are oversubscribed by more than the mean level + one-standard-deviation (Columns 1, 2, and 3), the mean level (Column 4), and the mean level + two standard-deviations (Column 5).

	Ln (IPO allocation)				
	1	2	3	4	5
Past laddering	0.97*		0.97*	1.06**	1.07**
	(1.9)		(1.9)	(2.1)	(2.1)
Past laddering * Oversubscribed	1.81**		1.81**	1.46**	1.77**
	(2.5)		(2.5)	(2.0)	(2.5)
Past stabilization		3.43***	3.43***	3.11***	3.50***
		(7.3)	(7.3)	(4.5)	(7.5)
Past stabilization * Oversubscribed		-0.27	-0.27	0.53	-0.36
		(-0.6)	(-0.6)	(0.7)	(-0.8)
Oversubscribed	-0.63***	-0.63***	-0.63***	-0.50***	-0.64***
	(-45.3)	(-45.2)	(-45.3)	(-40.9)	(-30.4)
Commission	0.96***	0.96***	0.97***	0.96***	0.97***
	(8.1)	(8.1)	(8.1)	(8.0)	(8.2)
Log (1+Portfolio)	5.12***	5.12***	5.12***	5.12***	5.11***
	(17.5)	(17.5)	(17.5)	(17.5)	(17.5)
Past pair	0.52***	0.52***	0.52***	0.48***	0.51***
	(33.0)	(33.1)	(32.9)	(29.9)	(32.3)
MV	-0.57***	-0.57***	-0.57***	-0.60***	-0.57***
	(-165.6)	(-165.6)	(-165.6)	(-179.7)	(-147.3)
BV/MV	0.46***	0.46***	0.46***	0.45***	0.48***
	(62.5)	(62.6)	(62.6)	(59.9)	(66.2)
VC	0.63***	0.63***	0.63***	0.66***	0.70***
	(28.4)	(28.4)	(28.4)	(29.8)	(31.4)
Top tier manager	-0.23***	-0.23***	-0.23***	-0.31***	-0.19***
	(-18.4)	(-18.4)	(-18.4)	(-24.4)	(-14.4)
Tech	1.01***	1.01***	1.01***	0.96***	1.02***
	(61.5)	(61.5)	(61.6)	(58.5)	(61.7)
Offer size	-3.09***	-3.09***	-3.09***	-2.91***	-3.05***
	(-141.7)	(-141.7)	(-141.7)	(-120.3)	(-136.5)

Time gap	0.25***	0.25***	0.25***	0.25***	0.29***
	(41.5)	(41.5)	(41.5)	(40.3)	(45.8)
Constant	-4.02***	-4.02***	-4.02***	-4.05***	-4.09***
	(-106.6)	(-106.5)	(-106.6)	(-107.3)	(-107.6)
N	187,570	187,570	187,570	187,570	187,570
Oversubscribed >	$\mu + \sigma$	$\mu + \sigma$	$\mu + \sigma$	μ	$\mu + 2\sigma$
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Adj R^2	69.2%	69.2%	69.2%	69.2%	69.1%

Table 7
Price Support and Long-Run Returns

Table 7 reports intercept coefficients and robust t-statistics in parentheses for standard OLS regressions of *HPER 3 month* and *HPER 6 month* on *Total support* and controls. All variables are defined in Table Appendix A2. Statistical significance at the 10%, 5%, and 1% level are indicated by *, **, and ***, respectively.

	HPER 3 month			HPER 6 month		
	1	2	3	4	5	6
Total support	-0.5***	-0.5***	-0.5***	-0.8**	-0.9**	-0.8**
	(-4.4)	(-5.0)	(-4.4)	(-2.3)	(-2.2)	(-2.3)
Total support * Price increase	-4.0**		-3.7**	-3.5*		-3.4*
	(-2.3)		(-2.0)	(-1.8)		(-1.8)
Price increase	72.3***		69.0***	86.2***		85.6***
	(4.2)		(3.8)	(3.5)		(3.5)
Total support * Price decrease		-1.9	-1.4		-3.1	-2.3
		(-0.5)	(-0.4)		(-0.9)	(-0.7)
Price decrease		-38.2***	-29.5***		-13.4	-2.4
		(-4.7)	(-3.8)		(-0.9)	(-0.2)
MV	-0.8	-1.1	-1.2	-0.2	-0.2	-0.3
	(-0.5)	(-0.7)	(-0.8)	(-0.1)	(-0.1)	(-0.1)
BV/MV	2.7	-1.4	2.4	8.7***	3.6	8.7***
	(0.7)	(-0.4)	(0.7)	(2.6)	(0.8)	(2.5)
VC	-12.8	-15.4	-13.6	-31.7**	-34.4**	-32.0**
	(-1.5)	(-1.6)	(-1.6)	(-2.2)	(-2.0)	(-2.1)
Top tier manager	2.0	2.0	0.9	-6.5	-4.9	-6.5
	(0.4)	(0.3)	(0.2)	(-1.2)	(-0.9)	(-1.2)
Tech	16.0	26.3	18.6	28.4*	39.1*	28.9*
	(1.2)	(1.6)	(1.4)	(1.7)	(1.8)	(1.7)
Offer size	6.8	14.1	6.6	-9.7	-0.2	-9.6
	(0.5)	(1.4)	(0.4)	(-0.7)	(0.0)	(-0.7)
Time gap	-2.4	0.3	-2.5	-7.6	-4.3	-7.7
	(-1.2)	(0.2)	(-1.5)	(-1.5)	(-0.9)	(-1.5)
Constant	-8.9*	7.3*	-4.7	-0.2	15.6***	0.4
	(-1.8)	(1.8)	(-1.0)	(-0.1)	(3.0)	(0.1)
N	188	188	188	188	188	188
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Adj R^2	32.6%	21.4%	34.6%	33.7%	24.3%	33.7%

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Appendix Table A1

Example of an IPO Time Line

Table A1 shows the planned listing time line provided in one of the IPO prospectuses. The prospectus was issued in November 1993.

	1993
First day of applications	November 26
Last day of applications	December 10
Allocation notification sent to applicants	December 17
Payment date	December 23
Registration of new shares in the OSE VPS	December 30
	1994
Listing on the stock exchange	January 10

Appendix Table A2

Variable definitions

BV/MV	Book value of equity divided by the market value of equity.
Commission	Monthly portfolio turnover in the 24 months prior to the IPO allocation times market share prices and a fixed rate of 0.075%. Only buy-generated commission is included. Minimum for one transaction is $15. In million USD.
First day return	The percentage change from the IPO offer price to the first day closing price.
HPER 3 month	The holding period return of the issuer in excess of the market return (the OBX) in the first three months after the listing.
HPER 6 month	The holding period return of the issuer in excess of the market return (the OBX) in the first six months after the listing.

IPO allocation	The number of allocated shares to each investor in % of the IPO issued shares.
Large investor	Investors with a portfolio bigger than $100,000 at the beginning of the calendar year. A portfolio of $100,000 is the 80th percentile.
MV	The number of outstanding shares at the listing date times the first day closing price. In billion USD.
Offer size	Calculated as: (The number of issued shares in the IPO) / (The number of outstanding shares in the company).
Oversubscribed	The binary variable that takes the value of one when the IPO has an *Oversubscription* greater than the mean level + one standard deviation.
Oversubscription	The total number of applied-for shares divided by the total number of issued shares in the IPO. Underwriters voluntarily report subscription numbers in the newspapers in the weeks following the listing. I assume that the 82 issues that are not reported in the newspapers after the listing were not oversubscribed.
Past laddering	The cumulative number of times an allocated *Large investor* has purchased more shares immediately after the listing in IPOs with *Price increase* = 1 before selling all shares within six months divided by the cumulative number of times the investors have participated in IPOs by the same underwriter.
Past stabilization	The cumulative number of times an allocated *Large investor* has purchased more shares immediately after the listing in IPOs with *Price decrease* = 1 before selling all shares within six months divided by the cumulative

	number of times the investors have participated in IPOs by the same underwriter.
Past pair	A binary variable that takes the value of one (otherwise zero) for investors who have received allocations from the same underwriter in the past.
Portfolio	The value of the investor portfolio on the OSE at 31.12.xx in the year before the IPO in billion USD.
Price increase	A binary variable that takes the value of one for IPOs with a *First day return* greater than (the mean + one-standard-deviation).
Price decrease	A binary variable that takes the value of one for IPOs with a *First day return* lower than (the mean - one-standard-deviation).
Support	The percent of the IPO issue that is purchased by allocated *Large investors* in the first month after the listing before being sold within six months.
Tech	A binary variable that takes the value of one (otherwise zero) for issuers in the technology sector.
Time gap	The difference between the IPO allocation date and the listing date in months.
Top tier manager	A binary variable that takes the value of one (otherwise zero) for issuers taken public by lead underwriters ranked in the eight highest out of all 32 possible based on issuer market capitalization; see Megginson and Weiss (1991).
Total Support	The cumulated *Support* per IPO.
VC	A binary variable that takes the value of one (otherwise zero) for issuers with venture capital backing.