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Laddering in Initial Public Offering Allocations

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Abstract

Tying Initial Public Offering (IPO) allocations of common stock to after-listing purchases in the IPO shares, a process referred to as IPO laddering, has resulted in large-scale investigations of the major investment banks by the SEC and the National Association of Securities Dealers (NASD). This process is claimed to drive after-listing share prices above their fundamental values, and is illegal under the laws against market manipulation and fraud. As a result, investment banks are reluctant to distribute information about their allocation practices, so investigating the alleged laddering and its implications has proven to be difficult. With a new and unique dataset of 16,593 IPO allocations on the Oslo Stock Exchange (OSE), we confirm the SEC's suspicion that IPO allocations are dependent on after-listing trading. Allocations to after-listing purchasing investors has been combined with allocations to high brokerage commissions generating investors that can take advantage of the IPO laddering, thereby allowing investment banks to recapture some of the money left on the table in IPOs. Allocated IPO investors buy more shares after new listings because they are rewarded for doing so with more IPO allocations.

1. Introduction

On December 6, 2000 the Wall Street Journal (WSJ) reported that the SEC and the NASD were investigating some of the major investment banks for tying IPO allocations to after-listing purchases. An investment banker interviewed for the article admits that IPO allocations to investors with after-listing interest could occur, but explains that after-listing interest is a signal that the investor is of the buy-and-hold type. Since banks strive to allocate shares to buy-and-hold investors to create price stability, after-listing purchases are related to IPO allocations. An investor confirms that expressing an interest in after-listing purchases is one way of obtaining more IPO allocations.

Three U.S. investment banks have been sued by the SEC over allegations of IPO laddering after the WSJ article, though all three later settled (without admitting guilt).[3] The allegations made by the SEC are that the banks promised investors that they would receive an increased allocation in current hot IPOs if they bought additional shares after the listing of the same IPOs.[4] The banks, allegedly asked IPO applicants if they would be interested in buying more shares after the listings and at what price and quantity. Since IPO laddering is illegal, there are no formal records of tying IPO allocations to after-listing trading, as agreements are likely to be made over the phone or in person rather than in a written agreement.[5] It is, however, possible to see if there is a positive and consistent relationship between IPO

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[3]See the litigation releases made by the SEC at http://www.sec.gov/litigation/litreleases/lr18385.htm, http://www.sec.gov/litigation/litreleases/lr19050.htm, and http://www.sec.gov/litigation/litreleases/lr19051.htm.

[4]There are many news articles and web pages that cover laddering and the laddering cases in USA. For excellent overviews please see Deneen and Hooghuis (2001), Aggarwal et al. (2006) and the IPO securities litigation websites at http://www.iposecuritieslitigation.com/, http://www.dandodiary.com/articles/ipo-laddering-cases/ and the articles by Susan Pulliam and Randall Smith, the journalists that first published the laddering scandal in the Wall Street Journal series in 2000. http://www.pbs.org/wgbh/pages/frontline/shows/dotcon/interviews/pulliam-smith.html

[5]In both Norway and the U.S. IPO laddering is illegal under the law against market manipulation.

allocations and after-listing trading by investors. Such a relationship would strongly indicate that IPO allocations are tied to after-listing buy trades, although this data is very hard to obtain in the U.S. (even for the SEC and NASD). Using data from the Oslo Stock Exchange, we are able to observe the after-listing trading of investors that were allocated shares in IPOs. The data consists of 16,593 IPO allocations with brokerage commissions and after-listing trading on the Oslo Stock Exchange in the period from 1993 to 2007. Stock ownership by investor ID is observed for all companies throughout the listing process, and is used to calculate actual IPO allocations. It is, from this data that the relationship between IPO allocations, after-listing purchases, commissions and future IPO allocations is investigated.

The main contribution of this paper is that we show a strong and robust relationship between the number of shares that are purchased after new listings and IPO allocations by laddering investors. We confirm the SEC's suspicion that IPO shares are allocated to investors that buy shares dictated by the investment bank. We define laddering as allocated IPO investors that continue to buy shares right after the listing before they sell all shares within six months of the listing date. This sales requirement is included to remove rationed investors that buy shares to reach optimal holding levels after the listing. We also show that IPO laddering benefits both investors and investment banks and that the specified trading can not be attributed to other explanations such as share rationing. In the 50% IPOs with the highest laddering there is an average aggregate IPO allocation to laddering investors of 4%. On average these investors buy 6% more of the aggregate IPO shares after the listing, and then sell on average 10% of the aggregate IPO shares shortly after the listing. As a consequence of this, we are not able to reject that IPO allocations are tied to after-listing purchases of IPO shares.

The SEC is investigating IPO laddering because laddering falsely increases the price and demand of specific shares (price manipulation). In addition to being abusive and discriminatory, IPO laddering is undesirable because it increases adverse selection problems (by deterring non-laddering investors from applying for IPO shares).[6] Investment banks use IPO laddering because this practice will boost share prices after the listings. IPO shares that will go up in price for sure can also be allocated to bank clients that provide high levels of brokerage commissions, thereby ensuring a future relationship between banks and investors that generate high levels of income for the banks. We show that investment banks and laddering inventors earn money on IPO laddering, while most companies with high levels of IPO laddering fall in price in the first six months after the listing (8 out of 11).

IPOs generally have high first day returns (on average 8% in Norway in the sample period) and IPO shares are therefore very popular investments. Most IPOs are many times oversubscribed and few investors are allowed to buy IPO shares. Investment banks are reluctant to distribute information about their allocation practices, and the continued investigation by the SEC and the NASD on investment bank allocation practices has not made data collection any easier. Ritter (2003) and Jenkinson and Jones (2004) argue that there are three main views on how IPOs are allocated. First, the academic view based on Benveniste and Spindt (1989) is that investors obtain IPO allocations in return for revealing their true valuations of the IPO shares. These investors help to price the issue. Second, the pitchbook view argues that IPO shares are allocated to buy-and-hold investors, and long-term buy-and-hold investors will create price stability. Finally, the rent seeking view argues that IPOs are allocated in

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[6]Laddering is not new. The SEC sent out warnings that laddering was illegal in 1961, 1984 and 2000 (Griffin et al., 2007).

return for kickbacks. The types of rent seeking that have been under SEC investigation are to condition IPO allocations on generated brokerage commissions, future corporate business (IPO spinning) or after-listing purchases of IPO shares (IPO laddering), see Liu and Ritter (2010). IPOs can also be intentionally underpriced in exchange for future analyst coverage (analyst conflict of interest). There are many articles that have studied both the academic and pitchbook view, but a lack of data has limited the number of articles which have studied the rent seeking view.[7] Cliff and Denis (2004) show that IPO underpricing is related to after-listing analyst coverage, Liu and Ritter (2010) reveal that IPOs are allocated in return for IPO spinning and Fjesme, Michaely and Norli (2010) document that IPOs are allocated in return for brokerage commissions. No empirical papers have been able to establish a relationship between IPO allocations and after-listing purchases of IPO shares (IPO laddering). Hao (2007) identifies the incentives to engage in IPO laddering and the implications of IPO laddering theoretically. Griffin, Harris and Topaloglu (2007) show empirically that it is likely that IPO laddering is used by studying aggregate after-listing trading at the brokerage house level. Griffin et al. (2007) find that after-listing buy trades primarily go through lead managers, whereas after-listing sell trades go through other managers in the weeks after new listings. This is consistent with IPO laddering because laddering investors will place their orders through the lead manager as evidence that the trades have been made. Previous research has not been able to study the relationship between IPO allocations and after-listing trading of the IPO shares at the investor level due to data limitations.[8] The main research

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[7]See, amongst others, Jenkinson and Jones (2004), Ritter (2003) and Fjesme, Michaely and Norli (2010) for papers that summarizes studies on IPO allocations.

[8]Griffin, Harris and Topaloglu (2007) find that it is very likely that investment banks tie IPO allocations to after-listing purchases. The major difference is that Griffin et al. (2007) study the after-listing trading through co and lead managers at the brokerage house level, and we study actual IPO allocations and after-

question addressed in this paper is whether investors are able to increase allocations in IPOs by committing to buy more shares after the listing of the same IPOs. We also investigate whether future IPO allocations are tied to after-listing purchases in past IPOs.

The rest of the paper is organized as follows: Section 2 describes related literature: Section 3 describes predictions and testable implications: Section 4 describes the IPO process and the factors that create the incentives to engage in IPO laddering: Section 5 describes the data set: Section 6 describes the empirical results, and Section 7 concludes.

2. Related literature

There are two main theoretical papers that model IPO laddering. Hao (2007) first show the factors that create the incentives to engage in IPO laddering. Then, the effects of IPO laddering on companies are identified. Hao (2007) argue that IPO laddering can benefit the underwriter from two sources. First, IPO laddering could boost the after-listing market price. This will reduce the underwriters expected cost of price support after the listing. From this, it is expected that IPO laddering will be stronger when there is a positive drift in the after-listing share price. Second, IPO laddering can benefit the underwriter through rent seeking. If some allocated investors pay a part of their profit from IPO allocations back to the underwriter through brokerage commission payments, then a part of the laddering generated profits will go back to the underwriter. Hao (2007) argue that when the underwriter share in on the profit from the underpricing, laddering is stronger when the realized percentage underpricing is higher. Hao (2007) also show that expected underpricing increases IPO laddering. More expected underpricing contributes to a greater extent of laddering. Hao (2007) predicts that

listing trading on the investor level. Griffin et al. (2007) show that it is likely that laddering is being used by investigating through what manager after-listing buy orders are placed, and we show that after-listing buy orders are related to current and future IPO allocations by investors.

laddering is positively related to IPO allocations to high commission generating investors. IPO laddering will inflate prices after the listing, so investment banks use laddering to make share prices go up after the listing (more than they otherwise would have). Shares that go up in price can then be allocated to clients that generate high revenue for investment banks through brokerage commissions. High brokerage commission investors sell shares after the listing and capture the (inflated) return. Investment banks receives payment for the allocations from inflated brokerage commission. Hao (2007) also predicts that laddering will increase the IPO offer price, the first day closing price, the money left on the table and long-run underperformance of the newly listed companies. Aggarwal et al. (2006) predict that IPO laddering increases underpricing, turnover and long-run underperformance of the newly listed companies. These are all effects of an increased demand of the IPO shares right after the listing that will fall in the long-run.

There are three main empirical papers that provide indirect evidence of the existence of IPO laddering. Griffin et al. (2007) look at investors who buy shares through lead and other underwriters in the three weeks after the listing of 1,294 Nasdaq IPOs in the period 1997 to 2002. As opposed to this study, they examine aggregate trading at the brokerage house level. They argue that the after-listing buy trades through the lead manager (main underwriter) in the weeks after the listings are likely to be part of laddering agreements, while buy trades through other managers (co-underwriters that help to spread the issue) in the same period are likely to not be part of the agreements. The paper finds that it is likely that IPO allocations are tied to after-listing purchases (IPO laddering) because there are unproportional high levels of buy trades through lead managers after new listings. Aggarwal et al. (2006) study IPOs that have been sued on laddering allegations to test the implications

of laddering. The data includes 33 IPOs sued by the SEC, 140 class action law suits and 735 non-laddering IPOs on Nasdaq, NYSE and AMEX in the period 1998 to 2000. The main findings are that IPO laddering leads to underpricing and long-run underperformance. Ellis (2006) investigates the trading volume in IPO shares after the listing for 311 Nasdaq IPOs in the period 1996 to 1997. She shows that investor buy trades through the lead underwriter account for 22% of trading volume after IPOs, and this is consistent with laddering being used.

There are also three other types of IPO rent seeking that have led to investigations and subsequent settlements with the SEC or the NASD (Liu and Ritter, 2010). IPO allocations can be dependent on future corporate business (IPO spinning), brokerage commissions or companies can agree to underprice IPOs in exchange for after-listing company coverage from a star analyst provided by the investment bank (analyst conflict of interest). All of these allocation practices have been investigated in empirical papers. Liu and Ritter (2010) investigate 56 U.S. IPOs in the period 1996 to 2000 and show that IPO shares are allocated to corporate executives in return for future corporate business (IPO spinning). Cliff and Denis (2004) show that IPO underpricing is positively related to the after-listing coverage by the lead underwriter and an all star analyst (analyst conflict of interest). Nimalendran, Ritter and Zhang (2007), Reuter (2006) and Fjesme, Michaely and Norli (2010) show that IPO allocations are related to brokerage commissions.

3. Predictions and testable implications

Griffin et al. (2007) argue that investment banks may strategically allocate toe-holds to

investors that the bank knows have higher optimal holding levels (share rationing)[9]. The bank does this in hopes that the investor will buy more shares after the listing to reach the optimal holding level[10]. It is expected that most of these investors will reach their determined holding level and then hold this in the longer run. Laddering investors, on the other hand, buy shares right after the listing to fulfill an obligation. Many laddering investors will therefore sell their shares when the agreement is completed. The argument is not that laddering investors will always liquidate their holdings early. The argument is that investors that buy more shares because of optimal holding are more likely to hold their shares in the long-run. Some laddering investors are likely to hold their shares in the long-run as well, but some laddering investors will also liquidate their shares early because they have no interest in holding the shares. It is important to note that the intention of the after-listing buyer to buy-and-hold does not remove the possibility of IPO laddering (Griffin et al., 2007).[11]

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[9]An IPO investor is rationed when the number of shares sought in the IPO is larger than the allocation. Rationing will lead to a smaller IPO allocation than the applied for shares for most investors. Rationed investors may buy more shares after the listing to get to the desired holding level. This has similar implications as IPO laddering. Over 50% of the investors that buy shares after the listing sell some or all of their shares within six months of the listing date. The SEC makes a big point about this in all their cases. The banks frequently allocated shares to investors that had no plans of holding the shares in the long run. The banks asked the investors if they would agree to buy more shares after the listing. The banks did not ask if the investors were planning to hold the shares in the long run. This is then laddering. If the reason for the after-listing purchases is to increase allocations, then this is laddering.

[10]Allocated IPO investors that buy more shares after new listings can be explained by either IPO laddering or by IPO share rationing. Most of the IPO first day return takes place between the offer price and the first day opening price (not between the first day opening and the first day close). This means that any additional purchased shares have an expected return commensurate with risk and nothing more. It is therefore expected that investors that buy more shares after the listing do so because they want to hold more of the specific stock in their portfolio. If there is laddering, there should then be a stronger relation between after-listing purchases and allocations for short term investors. Short term investors are more likely to be laddering investors than long term investors.

[11]Griffin et al. (2007) test between IPO laddering and optimal holding by studying how the aggregate institutional holding percentage evolves from the listing date to the first quarter and the first year after the listing. They argue that laddering investors are mainly institutional, so the aggregate institutional holding percentage should go down in companies with IPO laddering - since laddering investors will reduce their holding percentage and optimal holding investors will not. In the Norwegian data we observe that the investors are allocated IPO shares buy more IPO shares after the listing and then sell shares soon after the

Optimal holding is also not a very good explanation for the observed after-listing buying in Norway. Investment banks rank investors on A, B and C lists before the IPO allocations.[12] We do not know how investors are placed on the lists, but we believe that it is related to the investors' past trading characteristics. Investors on the A list are likely to be rationed less than investors on the B list, and investors on the B list are likely to be rationed less than investors on the C list. It is therefore expected that IPO applicants on the A list are awarded a big allocation and will buy few shares after the listing. Investors on the C list will be allocated few shares and will therefore buy many shares to reach their optimal holding level. This will create a negative correlation between the number of shares allocated and the number of shares purchased after the listing for these investors.

Hao (2007) argue that the two reasons why underwriters use laddering is to boost prices after the listing or to increase underpricing. First, Hao (2007) argue that banks use laddering to boost prices after the listing. Boosted prices is good for the banks because the expected price support cost is then reduced. IPOs with boosted after-listing prices will also be viewed as more successful. Second, Hao (2007) argue that when the underwriter share in on the profit from the underpricing, laddering is stronger when the realized percentage underpricing is higher. Hao (2007) also show that expected underpricing increases IPO laddering. More expected underpricing contributes to a greater extent of laddering. (It is likely that the expected underpricing is highly related to the realized underpricing). If there is IPO laddering, it is expected that the relationship between allocations and after-listing purchases is stronger

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listing. It is more likely that investors that follow this three stage IPO share investment process are laddering investors than optimal holding investors.

[12]Information about allocation practices are obtained from meetings with former investment bankers in Norway.

when the realized underpricing is higher. From Griffin et al. (2007) and the first argument in Hao (2007) we expect that laddering is more likely when there is a positive drift in the share price after the listing (boosted price) and after-listing investors sell their shares soon after the listing date. This is formalized in H0.1. From Griffin et al. (2007) and the second argument in Hao (2007) we expect that laddering is more likely when there is a positive underpricing and after-listing investors sell their shares soon after the listing. This is formalized in H0.2.

H0.1: The relationship between allocations and after-listing purchases is stronger when investors sell all shares within six months and the price after one week exceed the first day closing price.

H0.2: The relationship between allocations and after-listing purchases is stronger when investors sell all shares within six months of the listing and the first day closing price exceeds the offer price.

If there is share rationing that explains the relationship between IPO allocations and after-listing purchases, there is no reason why the relation should be stronger in IPOs where investors sell their shares soon after the listing, the price increase in the first week after the listing and the IPO is underpriced. This is formalized in HA.

HA: The relationship between IPO allocations and after-listing purchases is the same for all investors.

H0 and HA are tested by regression equation (1).[13] If the relationship between allocations

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[13]D1: A dummy that takes the value of one if the investor have sold all allocated and after-listing shares within six months of the listing date.

D2: A dummy variable that takes the value of one if there is a positive drift in the share price in the week

and after-listing shares is significantly stronger for (After-listing shares/shares issued)$\%_i$ * D1 * D2 * D3 than for (After-listing shares/shares issued)$\%_i$, then we are not able to reject H0. This will, however, reject HA.

(1)   (Allocated shares/shares issued)$\%_i = \alpha + \beta$(After-listing shares/shares issued)$\%_i + \beta$(After-listing shares/shares issued)$\%_i$ * D1 * D2 * D3 + β[Control variables] + ϵ_i

3.2 Testable implications of IPO laddering

We expect IPO laddering in both hot (popular/oversubscribed) and cold (less popular) IPOs. The SEC sued banks for tying IPO allocations to after-listing buying in hot IPOs (all IPOs referred to in the SEC litigation release have huge first day returns), while Griffin et al. (2007) find strong indications of laddering in cold IPOs. In hot IPOs, it is expected that the investors that buy more shares after the listing will earn money because they are allocated an increased portion of hot shares. It is possible that the investors either lose or earn money on the extra shares (this is uncertain and can go both ways according to an e-mail by Goldman Sachs referred to in the SEC release). It is, however, necessary that buying more shares should be profitable overall. Money earned on the hot IPO allocations should outweigh any loss on the additional shares. In cold IPOs, it is expected that the investors earn money on future IPO allocations. Although investors are not enthusiastic about cold IPOs, it is expected that investors will follow through with the laddering to not be excluded from future IPOs, see Griffin et al. (2007). This is tested by regressing past laddering on future IPO allocations. We also test if laddering investors in hot IPOs earn money on their

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following the listing (from the first day closing price to the first week closing price).
    D3: A dummy variable that takes the value of one if the IPO have a positive underpricing.

hot allocations and if laddering investors in cold IPOs earn money in total.

A possible reason why investment banks tie allocations to after-listing purchases is to earn more money on brokerage commissions. Laddering investors agree to buy more shares after the listing, so IPOs with laddering will increase more in price than IPOs with no laddering. Investment banks can then charge a higher brokerage commissions for IPO allocations with laddering (Hao, 2007). This will create a relation between the commissions generated before the IPO (by the non-laddering allocated investors) and the aggregate after-listing purchases (made by laddering investors). Commission investors are willing to pay more brokerage commission before the IPO for shares that will increase more in price after the listing (more IPO laddering). This is tested by regressing the IPO aggregated after-listing purchases made by the laddering investors on the average commission generated per share before the IPO (by the non-laddering allocated investors). These variables are highly related which shows that banks are able to earn money on IPO laddering.

4. The listing process and the incentives to engage in IPO laddering

The Oslo Stock Exchange (OSE) requires that companies have sufficient levels of equity to survive for 12 months without a positive cash flow after a listing. The OSE also requires that public companies must have a minimum number of owners (500 for the main list).[14] This means that most companies need to issue equity before they are able to list publicly. Table 1 gives the annual distribution of IPOs on the OSE in the sample period. Most companies are assisted by an investment bank in their equity issuance and in the listing process. The investment bank makes a list with proposed IPO allocations that is given to the board of

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[14]The information about the listing process is obtained from the seminar "The road to the listing" November 3, 2009 by Deloitte Public Accountants and the Oslo Stock Exchange and from meetings with former investment bankers in Norway.

the issuing company for approval. Anecdotal evidence suggests that this list typically is approved without adjustments. Investment banks and investors have different reasons for why they participate in IPO laddering. Regulators investigate IPO laddering because it is manipulative. Figure 1 describes the incentives to engage in IPO laddering for the different market participants.

4.1 Investment banks

IPO laddering can be advantageous for investment banks in both hot and cold IPOs. There are two main reasons why investment banks use IPO laddering in hot IPOs. Firstly, investment banks can earn money on combining allocations to investors that generate high brokerage commission and to laddering investors. IPO laddering will boost prices after the listing. The IPO allocations will then be valued higher by investors that are willing to pay brokerage commissions to obtain allocations (Hao, 2007; Aggarwal et al., 2006). In related papers, Reuter (2006), Nimalendran et al. (2006) and Fjesme, Michaely and Norli (2010) show that brokerage commissions are related to IPO allocations. Secondly, IPO laddering will ensure that prices will be higher (than they otherwise would have been) after the listing. This will give the companies more attention as successful IPOs (Hao, 2007; Aggarwal et al., 2006; Griffin et al., 2007). Laddering can also be beneficial for investment banks in cold IPOs. IPO laddering will reduce the after-listing price uncertainty in cold IPOs. This is good for investment banks because IPOs that fall in price may cause reputation damage (and price support if used without over allotment options is potentially expensive) (Hao, 2007; Aggarwal et al., 2006; Griffin et al., 2007). Investment banks use IPO laddering to earn more money on brokerage commissions, to increase the likelihood of successful IPOs and to reduce the risk

of after-listing price falls.[15] The after-listing purchases will also increase direct commission from the extra trades. According to Griffin et al. (2007), it is uncertain whether laddering is more beneficial for the investment banks in hot or cold IPOs.[16]

4.2 Laddering investors

Investors agree to buy more shares after cold IPOs to get future allocations in hot IPOs. Investors are not likely to be enthusiastic about laddering in cold IPOs, but investors who want continued access to future hot IPO allocations are likely to follow through with the agreements (Griffin et al., 2007). In hot IPOs, investors accept laddering in order to get more allocations in the specific IPOs. The committed laddering will increase hot IPO allocations and the dollar return made by the investor. Laddering investors may either earn or lose money on the extra shares purchased after the listing, but it is expected that the return of the hot allocated shares will outweigh any loss on the additional shares. This is described in an e-mail from a Goldman Sachs representative to an investor published in the SEC litigation release.[17] Investment banks do not require laddering by all investors. Griffin et al. (2007) argue that laddering is pre arranged buying support by large institutional clients. It is easier to control that the shares are purchased when there are only a few investors involved.

4.3 Commission investors

These investors increase their trading in other shares to generate higher levels of broker-age commissions. This commission is payment for IPO allocations. The investment bank

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[15]It is probably more common that bidders will offer laddering than that banks require laddering. Investors will offer laddering if they believe that this will increase allocations and lead to future allocations. Hao (2007) argues that it does not matter for the effect of laddering if it is bidder or investment bank initiated.

[16]Laddering in cold IPOs creates a relation between after-listing purchases and future allocations (not necessarily between allocations and after-listing purchases). Laddering in hot IPOs will create a relation between allocations and after-listing purchases in specific IPOs.

[17]See the litigation releases made by the SEC at http://www.sec.gov/litigation/litreleases/lr18385.htm, http://www.sec.gov/litigation/litreleases/lr19050.htm, and http://www.sec.gov/litigation/litreleases/lr19051.htm.

get an increased revenue from brokerage commissions, and the investors get an increased revenue from IPO allocations, see Hao (2007). Fjesme, Michaely and Norli (2010) show that IPOs are allocated to the investors that generate the most brokerage commission through trading in other shares. Allocated investors can sell their shares after the listing and cash in on the short run profit from hot allocations. As long as this short run profit is above any additional generated brokerage commission the investors are earning money. It is possible that banks direct IPO allocations to investors that generate high levels of brokerage commissions. Investors that generate high levels of brokerage commissions also have an incentive to direct their commission to certain investment banks in order to receive more future hot IPO allocations.

4.4 Regulators (why IPO laddering is a problem)

The reason why the SEC is investigating the investment banks is because IPO laddering violates both anti-price-manipulation and anti-fraud regulations. Laddering falsely increases price and demand in specific shares, and investors that are not aware of the IPO laddering are buying shares on false market demand information. Regulators (the SEC) try to ensure that the IPO allocation process and the IPO market are fair and open to all investors, and abusive allocation practices are not tolerated. Laddering is a problem because it is discriminatory against investors that are not willing to engage in price manipulation to receive IPO shares. In a fair IPO with high demand, the offer price will increase and more money will go to the issuing company. In an IPO with laddering, the price will go up after the listing and more money will go to the allocated investors. Laddering is not new in the U.S. The SEC sent out warnings that IPO laddering was illegal in 1961, 1984 and again in 2001 (Griffin et al., 2007). Other investors can also lose money on IPO laddering. The investors that

are allocated less (or no) IPO shares because the laddering investors are allocated more hot shares are losing. Non-allocated investors that buy shares after the listing lose money if the laddering investors sell their shares so that prices fall after the listing. IPO laddering will also increase adverse selection problems. When investors know that it is possible to buy allocations with after-listing trading, it is not likely that investors will participate in IPOs without providing anything in return. Investors that do not provide any form of kickback will not want to participate in IPOs because they expect shares to be overpriced whenever they are offered allocations.

The allegation made by the SEC is that certain banks have promised investors that they will get favorable IPO allocations if they buy additional shares after the listing of the same IPO.[18] The banks have, allegedly, asked IPO share applicants if they would be interested in buying more shares after the listings and at what prices and quantities. The banks have also allocated shares to investors with after-listing interest -investors the banks knew were likely to sell their shares soon after the listing (laddering investors). The banks have made follow up calls to investors that indicated after-listing interest to make sure the purchases are made. Arguably, the only reason investors have provided after-listing interest is because the investors understand that this will help them get favorable IPO allocations. Banks and investors have agreed that investors will buy after-listing shares proportional to the

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[18]Three U.S. Investment banks that have been sued and later settled with the SEC on IPO laddering allegations. None of the banks have admitted to the laddering charges, but all banks have agreed to pay penalties of $40 million (Morgan Stanley), $40 million (Goldman Sachs) and $25 million (J.P. Morgan). The charge by the SEC is that the banks have violated Rule 101 of Regulation M under the Securities and Exchange Act of 1934. This rule is, among other things, in place to prohibit underwriters in a restricted period, prior to their completion of the distribution of the IPO shares, from bidding for or attempting to induce any person to bid for or purchase any offered security in the aftermarket. Regulation M is designed to prohibit activities that can artificially influence the market and the perceived demand of the IPO shares.

allocations they receive.[19]

5. Data description

There are 403 new listings on the Oslo Stock Exchange (OSE) in the period January 1993 to September 2007 (195 of the 403 companies listed through IPOs)[20]. New listings are identified from the annual statistics published by the OSE. Allocation dates are collected from the IPO listing prospectuses. One listing requirement on the OSE is that all shareholders must be registered in the Norwegian Central Depository (VPS) before the listing. The number of shares owned by each investor must be given to the VPS before any company can list publicly. This database is 100% accurate, as it is not possible to list otherwise. The VPS database includes month end ownership by all shareholders in all companies that are publicly listed or intend to list publicly. Some companies list in the VPS database years before the listing, and other companies list in the VPS as part of the listing process. See Figure 3 for a detailed description of the timeline in the listing process. IPO allocations are obtained from the VPS database by taking the difference in company ownership before and after IPO allocation dates. We only investigate IPO allocations to new shareholders. More allocations to existing shareholders (if any) are not included in the analysis. All companies list in the VPS, sell shares in the IPO and list on the OSE. To determine IPO allocations, there are three dates that are important in the listing process: -when companies list in the VPS ownership database, when companies distribute shares in the IPO and when companies

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[19]In addition to these allegations, the NASD claims that J.P. Morgan tied cold IPO allocations to hot IPO allocations and that J.P. Morgan allocated hot IPO shares to investors in the return for accepting cold IPO allocations. This is also part of the J.P. Morgan settlement. Hao (2007) explains that IPO order books often have investors that are marked with the number of shares that will be purchased after the listing.

[20]In total 15 savings banks listed on the PCC list of the OSE are removed from the analysis. Most of the PCC companies are listed as privatizations by the Norwegian bank guarantee fund. When including the PCC companies the findings remain unchanged.

list on the OSE. All three dates influence data on IPO allocations. Companies do this process in different orders, and this leads to different levels of the obtained IPO allocations.

5.1 The IPO sample

When the listing in the VPS database, the IPO allocation and the listing on the OSE are in separate calendar months we are able to calculate exact IPO allocations (the ownership data is in monthly observations). Group one companies list in the VPS in good time before the IPO. These companies also list on the OSE in a separate calendar month from the IPO (for most companies, the IPO is in the calendar month right before the listing month). For these companies the IPO allocations are completely accurate. There are 16,593 IPO allocations in group one companies (23 IPOs). After-listing purchases are the increase in the number of shares by the allocated investors from the IPO allocation to the end of the listing month (and to the end of the month after the listing). Shares sold over the counter (OTC trading) in the period between the allocation day and the end of the allocation month will not be detected in the data. Investors that buy shares in the OTC market between the allocation day and the end of the allocation month will be treated as allocated investors. OTC trading is, however, expected to be a very small issue. It is unlikely that many investors that have been allocated IPO shares will sell these shares in the weeks before the listing. The average number of days between payment date in the IPO (when shares are transferred) and the listing date is just below 14 days (two weeks).[21]

5.2 The remaining IPOs

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[21]The reason why we have exact IPO allocations for these companies is because they sell shares in the IPO in the end of a month. The companies list early in the next month. Because the events are in separate calendar months we can identify who has been allocated shares in the IPO. It is very unlikely that investors that are allocated IPO shares will sell these shares in the two week window before they can realize the expected high first day returns.

The data set also includes 158,789 IPO allocations (148 IPOs) that are used in robustness tests.[22] The allocations in these IPOs include either some existing owners or some after-listing trading. Group two companies list in the VPS in good time before the IPO, but they list on the OSE in the same calendar month as the IPO allocation month. These companies have allocations that include the actual IPO allocations and some after-listing trading. These IPO allocations includes from one to 30 days of after-listing trading. The companies in group two are used to test the relationship between past and future after-listing IPO holdings.

5.3. Aggregate laddering

There are 317 investors who sell all allocated and all after-listing shares within six months of the listing date in IPOs with a positive underpricing (in the 50% IPOs with the highest laddering). The aggregate allocations to these investors is 4% of the IPO shares. They buy in aggregate 6% of the IPO shares after the listing. Within six months they have sold all IPO shares (in aggregate 10% of the IPO shares). There are 174 investors who sell all allocated and all after-listing shares within six months of the listing date in IPOs that appreciate in price in the week after the listing (in the 50% IPOs with the highest laddering). The aggregate allocations to these investors is 5% of the IPO shares. They buy in aggregate 8% of the IPO shares after the listing. Within six months they have sold all IPO shares (in aggregate 13% of the IPO shares).

5.4 Variable explanations

IPO level characteristics are given in Table 2. *Market value* is the total market value

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[22]The reason it is 148 IPOs and not 172 (195-23=172) is because in 15 IPOs it has not been possible to calculate IPO allocations from the ownership data. These companies are listed in the VPS in the same month as the listing month. These companies are therefore removed from the sample. In 6 IPOs it has not been possible to locate the pricing information. These IPOs are therefore not included in the analysis. There are three privatizations in the period that are removed.

(in USD) at the listing date of the IPO company. This is calculated as the number of outstanding shares times the first day closing price. *BV/MV* is the book to market ratio of the IPO company at the listing date. This is calculated as the book value of equity, after the IPO, divided by the market value. *Offer price* is the IPO offer price (in USD) reported in the listing prospectus or in the newspapers. *VC dummy* is a dummy variable that takes the value of one for companies with venture capital backing, and *Tech dummy* is a dummy variable that takes the value of one for IT -companies. The IPO company variables are used to control that the results are not driven by company specific characteristics. Market value and the book to market ratio are included in the regressions to make sure that company size is not driving the results. Offer price is included to make sure that it is not very high or low priced IPOs that drive the results. The VC dummy and the high-tech dummy are included to make sure that the results are not driven by venture capital backing or high technology companies. All regressions include IPO and year fixed effects. These are dummy variables that take the value of one for each of the companies and sample years.

Investor characteristics, for the investors on the OSE in the period 1993 to 2007, are described in Table 3. *(After-listing shares/shares issued) %* is the additional shares purchased after the listing divided by the total number of shares issued in the IPO.[23] The after-listing shares are calculated as the share increase from the IPO allocation to the end of the listing month for the 23 sample IPOs. (We also include the share increase to the end of the month

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[23]The number of shares sold in the IPO is the number of actual shares sold to new shareholders from the VPS database. In the listing prospectuses the number of shares sold is often listed as a range. E.g. in the Aqua Bio IPO the listing prospectus says that the number of shares sold will be between 1.2 million and 4 million shares. It is also uncertain if Over Allotment Options (OAO) is used or not. This may increase the number of shares sold from the listing prospectus to actual shares sold up to 20%. E.g. in the Nutri Pharma IPO the minimum number of shares sold is 10 million. The lead manager is given 2 million extra shares in an OAO. From the prospectus it is impossible to know the exact number of shares that will actually be sold. This number is observable in the VPS database.

after the listing because some companies list late in the month and IPO laddering may go on as long as three weeks after the listing, see Griffin et al., 2007). For the remaining IPOs, the share increase is measured from the end of the listing month to the end of the month after the listing. This is likely to underestimate the after-listing purchases in the IPOs used for robustness. *D1* is a dummy variable that takes the value of one if the investor have sold all allocated and after-listing shares within six months of the listing date. *D2* is a dummy variable that takes the value of one if there is a positive drift in the share price in the week following the listing (from the first day closing price to the first week closing price). *D3* is a dummy variable that takes the value of one if the IPO have a positive underpricing. *(Allocated shares/shares issued) %* is allocated shares to each investor divided by the total number of shares issued in the IPO.[24] This is the percentage allocation of shares given to each investor in each IPO. *Previous laddering* is the accumulated number of times an investor has laddered divided by the accumulated number of times the investor has participated in IPOs. This is a measure of how frequently an investor engages in laddering, relative to its total participations in IPOs.[25]

Commission is the accumulated commission (in USD) generated by each investor in the two years before the IPO allocation dates.[26] Commission is calculated as the monthly portfolio turnover times share prices and a fixed percentage commission rate (0.075%). The 0.075% commission rate is the average used by 15 Norwegian brokerage houses. Commission is cal-

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[24](Allocated shares/shares issued) % is trimmed at 1% at the total 171 IPO level to remove the highest IPO allocations. These allocations are not likely to be made to investors based on trading characteristics. This is included to be consistent with Fjesme, Michaely and Norli (2010). This trimming has no influence on the findings in this article.

[25]An investor that has participated in one IPO and bought more shares after the listing and then sold shares will take the value of 1 (1/1). An investor that has participated in two IPOs and bought and sold more shares after the listing in one of these IPOs will take the value of 0.5 (1/2).

[26]Commissions are generated from monthly data and not daily data.

culated as buy generated commission only. Generated commission below the minimum rate is replaced by the fixed minimum fee for one transaction ($15). *Portfolio value* is the total investor portfolio value (in million USD) for each allocated investor at 31.12.xx in the year before the IPO allocation date. This is calculated as the shares held at 31.12.xx times the appropriate share prices. *Financial institution dummy* is a dummy variable that takes the value of one for investors that are either Norwegian or foreign financial institutions.

Previous IPOs is the accumulated previous IPO participations by the investors divided by the accumulated number of IPOs in the sample.[27] This is used to measure how many IPOs, out of all possible in the sample, each investor has participated in. *Previous buy-and-hold* is the accumulated previous number of times the allocated investor has been a buy-and-hold investor divided by all previous IPO participations. This is the number of times, out of all previous IPO participations, the investor has held some of the IPO allocated shares for more than six months after the listing. *Previous flipping* is the accumulated number of times the investor has flipped previous IPOs divided by all previous IPO participations. Flipping is when all shares are sold within one month after a listing. This is the number of times, out of all previous IPO participations, the investor has held all IPO allocated shares for less than one month. The previous trading variables are used to control that the results are not driven

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[27]Many IPOs are underwritten by more than one investment bank. If there is more than one investment bank involved in the IPO, the bank that appears on the top left of the front page of the listing prospectus is assumed to be the lead investment bank. Carter and Manaster (1990) use the investment bank that appears top left on the tombstone as the lead investment bank. In most IPOs there are also co-managers that help with spreading the shares. Co-managers will allocate shares to their own clients. Investment banks can be co-managers in many IPOs, and this creates the situation where investors can be allocated shares as a reward in an IPO by another lead bank. There are also some mergers between investment banks in the period and this will also create the situation where award shares can come from other lead banks. Because of this, we investigate past trading behavior in all past IPOs in relation to current IPO allocations. We also study IPOs by one single bank separately. When this is done, we only investigate past trading in the IPOs where the one bank has been the lead.

by investor size, trading activity or holding periods.

Other control variables includes the *Percentage change in pricing range that* is the change from the midpoint in the pricing range to the offer price in book-building IPOs. This variable measures price information collected in the book-building period, see Ljungqvist and Wilhelm (2002). *Number of sentiment investors* is the number of allocated retail investors that buy less than 1,000 shares in the IPO. We use this as our sentiment measure as we believe that small retail investors are more sentiment driven in their IPO applications as they spend less time on fundamental analysis, see Kumar and Lee (2006). *Average commission per share* is calculated as the total commission generated by non-after-listing purchasing investors in the 24 month period before the IPO divided by the number of shares allocated in the IPO. This is the average dollar generated commission per share before the allocation (by non-laddering investors). *Combined commission %* is calculated as the commission generated by all the allocated investors in the 24 month period before each IPO divided by the accumulated commission generated by all the allocated IPO investors in the 24 month period before all IPOs. This variable measures how important commissions are for allocations in each specific IPO, and this variable is used to measure if there is a relationship between the total commission generated before an IPO (by the allocated investors) and the aggregate after-listing purchases in the IPO.

We do not know the exact oversubscription numbers in each IPO. Normally, oversubscription numbers are used to define if IPOs are hot (popular/oversubscribed) or cold (less popular/undersubscribed). We proxy for hot/cold by a dummy that takes the value of zero if there is negative first day return (cold) and one otherwise (hot). We expect that underpriced IPOs are hot and non-underpriced IPOs are cold.

6. Empirical results

From Table 4 it can be seen that there is a relationship between IPO allocations and after-listing purchases (regression 1). This relationship is significantly stronger for investors who sell their shares soon after the listing (regression 2). The relationship is also significantly stronger for investors that sell all shares soon after the listing in IPOs with a positive drift in the share price in the week after the listing (regression 3). This is consistent with H0.1. The relationship is also significantly stronger when investors sell shares soon after the listing and the IPO have a positive realized underpricing (regression 4). This is consistent with H0.2.

The relationship between allocations and after-listing purchases is also significantly stronger for investors that sell all shares soon after the listing, in IPOs with a positive underpricing, and in IPOs with a positive drift in the share price after the listing (regression 5). The point estimate for the allocation and after-listing purchase relationship is typically two to five times as large for the cases where H0 specify that the relationship should be stronger.

The results are also economically significant. The coefficient between allocation and after-listing purchases is 0.25. This means that for each 1% of the issues that is allocated these investors buy 4% more after the listing, controlling for all other variables. The average number of shares purchased after the listing is close to 7,000 shares for the 427 laddering investors. This indicates that the allocation rule is that investors who commit to buy 7,000 shares after the listing are allocated close to 2,000 more shares in the IPOs.

The results are robust to how many shares and how early the shares must be sold for investors to be regarded as laddering investors. The results remain unchanged when investors who have sold 50% of their shares within three months of the listing date are regarded as potential laddering investors. The relationship between IPO allocations and after-listing

purchases is significantly stronger for investors that sell 50% of total shares within three months after the listing, in IPOs with a positive underpricing, and in IPOs with a positive drift in the share price after the listing than for other investors (regression 6). The relationship is also significantly stronger for investors that sell 50% of total shares within six months after the listing, in IPOs with a positive underpricing, and in IPOs with a positive drift in the share price after the listing (regression 7). This is consistent with H.0.[28] Most of the control variables are unrelated to the level of allocations. Generated brokerage commissions are positively related to allocations. This indicates that laddering investors are active investors.

To make sure that the results are not driven by the other allocations views suggested by Ritter (2003) and Jenkinson and Jones (2004) we control for these views in all regressions. To control for the pricing information view (the academic view) we include a dummy variable that takes the value of one for all professional investors (financial institution dummy). If there is allocation to buy-and-hold type investors, there will be a relation between holding periods and IPO allocations (buy-and-hold view). This is controlled for by including the past IPO holding period of the allocated investors in all regressions (past buy-and-hold and past flipping). Neither of these variables are consistently related to allocations. It is also possible that allocations are made to commission generating investors only (rent seeking view). This view is controlled for, and ruled out by including the portfolio value and the generated commission before the IPOs by the allocated investors in the regressions.[29]

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[28]In these regressions, both allocated shares and aftermarket shares are scaled by the number of shares issued in the IPOs. There are very different numbers of shares sold in each IPO. Capital raised depends on both the number of shares and on the offer price in the IPO. The numbers we are interested in are therefore allocated shares and aftermarket shares in percent of issued shares. This tests the relationship regardless of the number of shares issued in the IPO. We also regress allocated shares on aftermarket shares directly without adjusting for issued shares in all regressions. This does not alter the findings. There are some changes to significance levels and adjusted R –squares, but the results remain the same (not reported).

[29]We are not able to control for IPO spinning. IPO spinning is when IPO shares are allocated to company

In Table 5 the relation between past IPO laddering and future ownership of IPO shares is investigated more closely. If there is IPO laddering, it is expected that investors may be rewarded with allocations in future IPOs as well. Testing the relation between past laddering and future allocations is harder in the 23 IPO sample because there may be some time between each observed IPO. This is therefore tested on the full sample that includes after-listing trading. Here we test whether investors that buy more (and then sell) shares after the listing of IPOs also hold shares after the listing of future IPOs. In Table 5 all 171 IPOs (with 175,382 IPO allocations) are investigated. Most of these IPOs are of group 2 allocations. This means that the IPO allocations may be overestimated and the after-listing purchases may be underestimated in these IPOs.[30] Therefore, we are not studying allocations. Rather, this table investigates whether past after-listing buying leads to future after-listing holding of IPO shares.

In Table 5 we regress after-listing holdings of IPO shares on the number of times in the past (out of all IPO participations) allocated investors have bought (and then sold) more shares after IPOs. There is a strong relation between past IPO laddering and shares held after future IPOs. This indicates that banks tie IPO allocations together. This indicates that IPO shares are also rewards for past laddering in IPOs.[31] There is a consistent negative

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executives for future corporate business. Spinning will not generate the same implications as IPO laddering, so we argue that this is not a problem.

[30] These shares are still purchased by the investors. Aftermarket purchases for group two IPO allocations are calculated as the share increase from the end of the listing month to the end of the month after the listing. This means that all of these investors have an increase in the IPO shares in this period. All of these investors are buying shares after the listing of IPOs. These investors also hold significantly more IPO shares in subsequent IPOs. Table 5 shows that investors who hold shares after the listing of IPOs, before they buy more shares in the following month, also hold more shares of future IPOs. This is consistent with the laddering story. We cannot show that IPO allocated investors who buy more shares after a listing are allocated more hot IPO shares, but we show that investors who buy more (and then sell) shares after the listing of an IPO have more IPO shares in their future portfolios.

[31] Past aftermarket buying is less statistically and economically related to IPO allocations in the 20 IPOs by the least active investment banks (not reported). The tie-in agreement variables are highly related to IPO

relationship between past buy-and-hold and IPO allocations. Investors are not allocated shares because they repeatedly hold their shares in the long-run. Investors are, however, punished for flipping shares in the past. Flipping investors are kept out of future hot IPOs. These findings also show that the investment banks keep records of how investors trade in IPOs. The banks use these records in their future IPO allocations. This is consistent with the SEC releases where it is claimed that banks track investor trading and use this in their future allocation decisions.

In Table 6 we show that investors are able to earn a profit from IPO laddering. For allocated shares, monetary return is calculated as the number of allocated IPO shares times the first day and first month return. For shares purchased after the listing, monetary return is calculated as after-listing shares times the first month return. It is clear that the profit earned from hot IPO allocations outweighs any loss from the after-listing purchases. Table 6A show that the average return made by the 357 investors who ladder in IPOs with a positive realized underpricing have a positive return overall. This is also true for the 195 investors who ladder in IPOs with a positive drift after the listing (Table 6B). The 70 investors (427 laddering investors - 357 laddering investors in hot IPOs) that ladder in cold IPOs are earning a profit in their overall IPO participation. This indicates that these investors are rewarded in future IPOs for their cold IPO laddering (Table 6C). The 23 IPO sample is also split into high and low laddering IPOs based on the 427 investors who sell all shares within six months of the

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allocations in the IPOs by the most active investment bank (not reported). The results indicate that active IPO investment banks are able to use tie-in agreements. The reason why investors go through with the tie-in agreements, and buy more shares after the listing, is to avoid being blacklisted in future IPOs. An active investment bank will have a more reliable threat than less active banks. There is no relationship between IPO allocations and aftermarket purchases by Norwegian government investors. This is also as expected. The findings are consistent with Pulliam and Smith (2000), Ritter (2003), Aggarwal et al. (2006), Hao (2007) and Griffin et al. (2007).

listing. Non-allocated investors that buy shares after the listing in the high laddering IPOs are losing money on average (Table 6D). This is not true in the IPOs with low laddering (Table 6E). This shows that IPO laddering is profitable for the investors. However, IPO laddering is very bad for non-allocated IPO investors that buy shares after the listing.

In Table 7 we show that there is a positive relationship between aggregate after-listing buying in each IPO (by the investors who sell all shares within six months of the listing) and the average commission generated by other allocated investors before the IPO. This is an important condition for IPO laddering to take place. A main reason why an investment bank would engage in IPO laddering is to increase revenue by sharing in on the money left on the table. Investment banks bundle IPO shares to laddering investors and commission investors, and thus create a positive relation between after-listing buying and commissions generated by the allocated investors before the IPO. Laddering investors increase prices after the listing, and commission investors pay more commission for shares that will increase in price for sure. The investment banks earns more money from brokerage commissions in the IPOs where there are more shares purchased after the listing. The data is consistent with that investment banks bundle IPO allocations to high brokerage commission investors and laddering investors.

6.2 Optimal holdings

We reject the hypotheses that the relation between IPO allocations and after-listing buying is driven by optimal holding of shares. There is a stronger relationship between IPO allocations and after-listing purchases for investors that sell all shares soon after the listing, in IPOs with a positive underpricing, and in IPOs with a positive drift in the share price after the listing. There is also no relationship between IPO allocations and past buy-and-

hold. Investment banks do not allocate shares to investors because they are expected to be buy-and-hold (based on past trading). Therefore, the after-listing purchases are not simply a result of investors trying to reach their optimal holding levels. We reject HA.

6.3 The effect of IPO laddering

We find indications that laddering is affecting company long-run returns negatively after the listing (not reported).[32] The 11 companies with high levels of IPO laddering have a negative price evolvement in the time after the listing on average. Non-allocated IPO investors who buy shares in this period are losing money on average. This is consistent with both Hao (2007) and Aggarwal et al. (2006). When comparing long-run returns of IPOs with laddering to a one for one matching listed firm, the underperformance results are very weak with zero or very low explanatory power. The matching firm technique is also biased towards finding long-run underperformance, see Eckbo, Masulis and Norli (2008). We are not able to conclude that high levels of laddering leads to low long-run performance, but the results indicate that laddering is negatively related to long-run performance.

6.4 Robustness and aggregate IPO laddering

The results are robust to including all PCC (savings banks) and trimming IPO allocations at 0.1% (Table 8). The results are also robust to removing all company specific control variables (Table 9). Table 10 show that IPO laddering involves an economically significant amount of IPO shares. On average investors are allocated 4% of IPO shares, they buy 6%

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[32]Long run performance is calculated as the (IPO company holding period return / matching company holding period return) (Ritter, 1991). This long run return measure is regressed on the aggregate level of aftermarket share buying and a set of control variables. Companies are matched on market values and book to market ratios, see Eckbo and Norli (2005). All matching companies with a market value within 30% of each IPO company are grouped together. Only companies that have been listed for more than five years are included as matching companies. The company with the book to market ratio that is closest to the IPO company is used as the matching company. A delisted matching company is replaced by the company with the second closest book to market ratio for the remaining years etc.

more shares, and then they sell 10% of the IPO shares (in the 50% IPOs with the highest IPO laddering).

7. Conclusion

There is a stronger relationship between IPO allocations and after-listing purchases when investors sell shares soon after the listing, the IPO have a positive realized underpricing and there is a positive drift in the share price after the listing. This finding is not consistent with HA and this hypothesis is therefore rejected. We reject that the relationship between IPO allocations and after-listing purchases is driven by share rationing only. This finding is, however, consistent with H0. We are not able to reject that the relationship between IPO allocations and after-listing purchases is driven by IPO laddering. The evidence support IPO laddering.

We find that laddering investors who buy more shares after the listing are also allocated more shares in IPOs. This controls for the commissions generated by the investors, portfolio value, investor type, past trading characteristics and company specific variables. These investors also sell their shares shortly after the listing and earn a high profit from their IPO participation, which is consistent with IPO laddering. The investors that buy the most shares after the listing are also allocated the most shares. These investors are not expected to hold the shares based on past trading characteristics. There is also a positive relationship between the number of times investors have used laddering after the listing in previous IPOs and after-listing ownership of future IPO shares. There is no relationship between past buy-and-hold and future IPO share ownership, -further indicating that this is IPO laddering. Laddering gives more shares in specific IPOs and more shares in future hot IPOs. The aggregate ladder-

ing in IPOs is also positively related to the average commission generated by the allocated investors before the IPOs, thus demonstrating that there is more laddering when there are more shares allocated to investors that generate high levels of brokerage commissions. Investment banks seems to be able to earn money on IPO laddering by combining allocations to after-listing investors and high commission investors. The evidence is consistent with IPO laddering. We are not able to reject that IPO laddering is being used.

There are many implications of this finding. The main practical implication is that investors who are not aware of IPO laddering lose money on trading in IPO shares in comparison to more informed investors. IPO laddering is also likely to increase adverse selection problems as many investors are likely to stay away from the IPO market when they know they must provide kickbacks to acquire the good allocations. In the U.S. there has been a large-scale investigation of IPO allocation practices, and this study shows that more countries should probably start their own investigations as well. A main theoretical implication of this finding is that IPO allocation practices should probably be explained more from a rent seeking perspective since most theoretical papers explain IPO allocations from a pricing information or buy-and-hold perspective.

There are some limitations to this study. With regard to the generated brokerage commissions, we cannot see that a commission is paid from the allocated investor to the investment bank, and can only observe that the commission has been generated. We also calculate commissions based on monthly data, and this is likely to underestimate commissions. The study does not conduct and in-depth investigation of long-run performance (as we only observe a limited number of companies), and we also do not know the oversubscription numbers of the IPOs. This is proxied for by using the actual first day return as the oversubscription hot/cold

IPO dummy. Nevertheless, we do expect this dummy to be very accurate. In terms of future research, it would be very interesting to investigate a sample which included the actual IPO laddering agreements in writing.

References

[1] Aggarwal, Rajesh K., Amiyatosh K. Purnanandam and Guojun Wu, 2006, Underwriter Manipulation in Initial Public Offerings. Working paper. University of Virginia and University of Michigan.

[2] Benveniste, Lawrence and Paul Spindt, 1989, How investment banks determine the offer price and allocation of new issues, Journal of Financial Economics 24, 343-362.

[3] Carter, Richard B. and Steven Manaster, 1990, Initial Public Offerings and the underwriter reputation, Journal of Finance 45, 1045-1067.

[4] Cliff, Michael T. and David J. Denis, 2004, Do Initial Public Offering Firms Purchase Analyst Coverage with Underpricing?, Journal of Finance 6, 2871-2901.

[5] Deneen, M., and J. Hooghuis, 2001, Tidal Wave of IPO 'Laddering Litigation' Swamps D&O Market, The Plus Journal 9.

[6] Eckbo, Espen B. and Øyvind Norli, 2005, Liquidity risk, leverage and long-run IPO returns, Journal of Corporate Finance 11, 1-35.

[7] Eckbo, Espen B., Ronald W. Masulis and Øyvind Norli, 2000, Seasoned Public Offerings: resolution of the 'new issues puzzle', Journal of Financial Economics 56, 251-291.

[8] Ellis, Katrina, Roni Michaely and Maureen O'Hara, 2000, When the Underwriter Is the Market Maker: An Examination of Trading in the IPO Aftermarket, Journal of Finance 3, 1039-1074.

[9] Ellis, Katrina, 2006, Who trades IPOs? A close look at the first days of trading, Journal of Financial Economics 79, 339-363.

[10] Fjesme, Sturla Lyngnes, Roni Michaely and Øyvind Norli 2010, Using Brokerage Commissions to Secure IPO allocations, Working paper, Norwegian School of Management (BI).

[11] Griffin, John M., Jeffrey H. Harris and Selim Topaloglu, 2007, Why are IPO investors net buyers through lead underwriters?, Journal of Financial Economics 85, 518-55.

[12] Hao, Qing (Grace), 2007, Laddering in initial public offerings, Journal of Financial Economics 85, 102-122.

[13] Jenkinson, Tim, and Howard Jones, 2004, Bids and Allocations in European IPO Bookbuilding, Journal of Finance 5, 2309-2338.

[14] Kecskes, Ambrus, Roni Michaely and Kent Womack, 2010, What drives the Value of Analysts Recommendations: Earnings Estimates or Discount Rate Estimates?, Working paper Cornell University.

[15] Kumar, Alok and Charles M.C. Lee, 2006, Retail Investor Sentiment and Return Co-movements, Journal of Finance 5, 2451-2486.

[16] Liu Xiaoding and Jay. R. Ritter, 2010, The Economic Consequences of IPO Spinning, Review of Financial Studies 5, 2024-2059.

[17] Ljungqvist, Alexander P. and William J. Wilhelm, 2002, IPO allocations: discriminatory or discretionary?, Journal of Financial Economics 65,167-201.

[18] Loughran, Tim and Jay R. Ritter, 1995, The New Issues Puzzle, Journal of Finance 1, 23-51.

[19] Loughran, Tim and Jay R. Ritter, 2004, Why has IPO underpricing changes over time?, Financial Management 33, 5-37.

[20] Megginson, Willian and Kathleen Weiss, 1991, Venture capitalists certification in initial public offerings, Journal of Finance 46, 879-904.

[21] Michaely, Roni and Wayne H. Shaw, 1995, The Choice of Going Public: Spin-offs vs. Carve-Outs, Financial Management 24, 5-21.

[22] Nimalendran, M, Jay Ritter, and Donghang Zhang, 2007, Do today's trades affect tomorrows IPO allocations? Journal of Financial Economics 84, 87-109.

[23] Pulliam, Susan and Randall Smith, 2000, Trade-offs: Seeking IPO Shares, Investors Offer to Buy More in the After Market, The Wall Street Journal December12, 2000.

[24] Pulliam, Susan and Randall Smith, 2000B, Linux Deal is focus of IPO-Commission Probe, The Wall Street Journal, December 12, 2000.

[25] Reuter, Jonathan, 2006, Are IPO allocations for sale? Evidence from Mutual Funds, Journal of Finance 5, 2289-2324.

[26] Ritter, Jay R.,1984, The 'hot issue' market of 1980, journal of Business 32, 215-240.

[27] _____, 1987, The cost of going public, Journal of Financial Economics 19, 269-281.

[28] _____, 1991, The long run performance of Initial Public Offerings, Journal of Finance 46, 3-27.

[29] ____, 2003, Differences between European and American IPO markets, European Financial Management 4, 421-434.

[30] Rogers, W. H.,1993, Regression standard errors in clustered samples, Stata Technical Bulletin 13, 19-23. Reprinted in Stata Technical Bulletin Reprints 3, 88–94.

[31] White, Halbert, 1980, A heteroscedasticity-consistent covariance matrix estimator and a direct test of heteroscedasticity, Econometrica 48, 817-838.

Table 1
The number of Initial Public Offerings on the Oslo Stock Exchange

The column labeled "Population" lists the number of Initial Public Offerings on the Oslo Stock Exchange in the sample period. The column labeled "Data" indicates the IPOs with allocation data. The column labeled "Prospectus" lists the IPOs where we have been able to locate the listing prospectus. The column labeled "Sample" lists the 23 sample IPOs. The columns labeled "Value of shares" list the annually aggregate million USD values of shares sold in the 154 IPOs with listing prospectus. "All", "New" and "Secondary" indicates the value of all shares, only newly issued shares and shares sold by existing shareholders respectively. The columns labeled "Prospectus" and "Sample" is the annual aggregated USD million value of shares sold in the IPOs with prospectuses and in the 23 IPO sample respectively. Value of shares sold is reported in USD using a USD/NOK exchange rate of 0.1792. The sample period is January 1993 through September 2007.

| | Number of IPOs | | | | Value of shares (Million USD) | | | | | |
| | | | | | All | | New | | Secondary | |
Year	Population	Data	Prospectus	Sample	Prospectus	Sample	Prospectus	Sample	Prospectus	Sample
1993	11	9	7		541		539		2	
1994	15	9	8	3	275	147	218	142	57	5
1995	14	12	9	2	452		49		403	
1996	15	11	7	2	137	80	56		81	80
1997	29	25	19	9	976	230	504	21	471	209
1998	12	9	8	1	189	87	145	87	43	
1999	3	3	3		50		21		29	
2000	10	10	10	2	817	101	753	89	64	12
2001	4	4	4		183		166		17	
2002	2	2	2	2	70	70	64	65	51	5
2003	2	2	2		83		78		5	
2004	14	14	14		1,605		1,319		287	
2005	31	30	30	2	2,041	34	566	23	1,475	11
2006	18	17	17		2,730		2,237		493	
2007	15	14	14		912		517		395	
Total	195	171	154	23	11,061	749	7,232	427	3,873	322

Table 2
Summary Statistics of Firms Going Public on the Oslo Stock Exchange

Panel A reports the company characteristics for the 23 IPOs sample and all 171 IPOs with data. "(After-listing shares/shares issued) %" is the additional shares purchased after the listing divided by the shares issued in the IPOs. "-That sell shares within 6 months " is the "(After-listing shares/shares issued) %" for only investors that sell all shares within six months of the listing date. "Market value (Mill USD)" is the number of shares outstanding on the listing day times the first day closing price. "Book/Market" is the book value of equity after the IPO divided by the market value on the listing day. "Offer price" is the USD IPO price in the listing prospectuses. "VC dummy" is a dummy variable that takes the value of one if the company has venture capital backing. "Tech. dummy" takes the values of one for IT -companies. "First day return" is the percentage price change from the offer price to the first day closing price. USD values are calculated from a USD/NOK exchange rate of 0.1792. In Panel B the 23 Sample IPOs are split into IPOs with high and low after-listing purchases by investors that sell all shares within six months of the listing date. T –statistics are calculated as: Difference / (square root [(variance sample 1/ numbers in sample 1) + (variance sample 2/ numbers in sample 2)].

Panel A		Sample 23 IPOs				All 171 IPOs			Mean difference	
	N	Mean	Std.Dev	Median	N	Mean	Std.Dev	Median	Diff.	t-stat.
(After-listing shares/shares issued)	23	8.7%	7.6%	6.2%	171	5.8%	6.2%	3.8%	2.9%	(1.8)
-That sell shares within 6 months	23	3.3%	3.7%	2.3%	171	3.6%	5.0%	1.7%	-0.3%	(-0.3)
Market value (Mill USD)	23	$149.3	$145.2	$117.3	171	$311.4	$871.9	$108.3	-$162.1	(-2.2)
Offer price USD	23	$8.7	$6.9	$7.2	171	$8.2	$6.4	$6.8	$0.5	(0.3)
Book/Market	23	0.3	0.29	0.23	171	0.46	0.33	0.4	-0.16	(-2.4)
VC backed dummy	23	0.17	0.39	0.0	171	0.18	0.38	0.0	-0.01	(-0.1)
Tech dummy	23	0.09	0.29	0.0	171	0.12	0.32	0.0	-0.03	(-0.5)
First day return	23	0.13	0.19	0.09	171	0.08	0.19	0.03	0.05	(1.2)

Panel B		11 high laddering IPOs				12 low laddering IPOs			Mean difference	
	N	Mean	Std.Dev	Median	N	Mean	Std.Dev	Median	Diff.	t-stat.
(After-listing shares/shares issued)	11	12.6%	8.5%	8.4%	12	5.2%	4.7%	4.4%	7.4%	(2.6)
-That sell shares within 6 months	11	6.2%	3.5%	5.2%	12	0.7%	0.8%	0.4%	5.5%	(5.1)
Market value (Mill. USD)	11	$117.3	$67.1	$95.8	12	$178.8	$190	$144.9	-$61.5	(-1.1)
Book / Market ratio	11	0.34	0.3	0.26	12	0.26	0.29	0.22	0.08	(0.6)
Offer price (USD)	11	$9.0	$5.4	$8.1	12	$8.5	$8.3	$5.7	$0.5	(0.2)
VC backed dummy	11	0.09	0.3	0.0	12	0.25	0.45	0.0	-0.16	(-0.1)
Tech. dummy	11	0.0	0.0	0.0	12	0.17	0.39	0.0	-0.17	(-1.5)
First day return	11	0.16	0.16	0.18	12	0.1	0.21	0.06	0.06	(0.8)

Table 3
Summary Statistics on IPO Allocations and on Investors Trading

Panel A reports the summary statistics for the individual trading prior to the 23 sample and all 171 IPOs on the Oslo Stock Exchange in the period 1993 to 2007. "(Allocated shares/shares issued) %" is the number of allocated shares to each investor divided by the shares issued in the IPO. "(After-listing shares/shares issued) %" is the additional shares purchased after the listing divided by the shares issued in the IPOs. "Commission" is the accumulated commission generated in USD by the investors in the two years before the IPO allocation date. "Portfolio value" is the portfolio value in million USD for each allocated investor at 31.12.xx in the year before the IPO allocation date. "Previous IPOs" is the accumulated previous IPO participations by the investors divided by the accumulated IPO number in the sample." Previous Buy-and-hold " is the accumulated previous number of times the allocated investor has been a buy-and-hold investor as a percent of all previous IPO participations. This is the number of times the investor has held some IPO allocated shares for more than six months in previous IPOs. "Previous Flipping" is the accumulated number of times the investor have flipped previous IPOs as a percent of all previous IPO participations before the IPO allocation. Flipping is when all shares are sold within one month of the listing. USD values are calculated from a USD/NOK exchange rate of 0.1792. Panel B reports that investors that buy (and sell) more shares after the listing are allocated significantly more IPO shares than investors that do not. T –statistics are calculated as: Difference / (square root [(variance sample 1/ numbers in sample 1) + (variance sample 2/ numbers in sample 2)].

Panel A

	Sample 23 IPOs				All 171 IPOs			
	N	Mean	Std.Dev	Median	N	Mean	Std.Dev	Median
(Allocated shares/shares issued) %	16,593	0.053%	0.173%	0.009%	175,382	0.036%	0.14%	0.003%
(After-listing shares/shares issued) %	16,593	0.011%	0.19%	0.0%	175,382	0.006%	0.12%	0.0%
Commission USD	16,593	$3,544	$46,711	$37.9	175,382	$6,274	$93,395	$30.8
Portfolio value million USD	16,593	$2.6	$44.5	$0.003	175,382	$3.6	$72.6	$0.004
Previous IPOs	16,593	0.05	0.05	0.04	175,382	0.03	0.05	0.017
Previous Buy-and-hold	16,593	0.21	0.37	0.0	175,382	0.21	0.37	0.0
Previous Flipping	16,593	0.15	0.31	0.0	175,382	0.1	0.25	0.0

Panel B

	Comparing IPO allocations to after-listing investors and non after-listing investors								
	Laddering investors				All investors			Mean Difference	
After-listing shares:	N	Mean	Std.Dev	Median	N	Mean	Std.Dev	Median	Diff.	t-stat.
*D1	427	0.116%	0.264%	0.018%	16,593	0.053%	0.173%	0.009%	0.06%	(4.9)
*D1 and D2	195	0.097%	0.263%	0.009%	16,593	0.053%	0.173%	0.009%	0.04%	(2.3)
*D1 and D3	357	0.097%	0.239%	0.017%	16,593	0.053%	0.173%	0.009%	0.04%	(3.5)
*D1, D2 and D3	195	0.097%	0.263%	0.009%	16,593	0.053%	0.173%	0.009%	0.04%	(2.3)

Table 4
Relationship between After-listing Purchases and IPO Allocations

This table reports the coefficients and heteroscedastic consistent t -statistics (errors adjusted for clustering across firms Rogers, 1993) in parentheses for the regressions with (allocated shares/issued shares) % as the dependent variable. This is a standard OLS model. Only the 23 IPOs with exact allocations are included. All variables are as described in Table 2 and Table 3. In regression 6 and 7 D1 indicates if more than 50% of shares are sold within three and six months.

	(Allocated shares/shares issued) %	
	Reg 1	Reg 2
Intercept	0.6366	0.7096
	(2.3)	(2.8)
(After-listing shares/shares issued) %	0.0738	0.054
	(1.6)	(1.4)
(After-listing shares/shares issued) %* D1		0.1306
		(1.7)
D1 -Investors sell shares within months a listing		-0.0283
		(-1.3)
Log (commission)	0.0111	0.0096
	(2.5)	(2.2)
Log (portfolio value)	0.0014	0.0018
	(0.6)	(0.9)
Previous IPOs of possible	0.2242	0.2085
	(0.7)	(0.7)
Previous buy-and-hold of possible	-0.0076	-0.0046
	(-0.3)	(-0.2)
Previous flipping of possible	-0.019	-0.0207
	(-0.6)	(-0.6)
Financial institution dummy	0.0657	0.0743
	(0.9)	(1.1)
Log (market value)	-0.0573	-0.0602
	(-4.2)	(-4.8)
BV / MV equity	0437	0.4309
	(7.3)	(6.7)
Offer price	-0.0024	-0.0023
	(-4.0)	(-3.9)
VC backed dummy	1.0986	1.1027
	(15.5)	(14.5)
High-tech dummy	-0.9268	-0.9488
	(-12.0)	(-14.5)
First day return	dropped	dropped
Company and year dummy	yes	yes
Observations (IPO allocations)	1,016	1,016
-of which are laddering investors		427
Adjusted R -squared	33.6%	35.2%
Investors sell within months of listing		all 6m.

Continued...	(Allocated shares/shares issued) %				
	Reg 3	Reg 4	Reg 5	Reg 6	Reg 7
Intercept	6.0717	1.9466	1.268	1.3036	1.1851
	(16.8)	(9.4)	(10.6)	(10.6)	(13.7)
(After-listing shares/shares issued) %	0.0486	0.0587	0.0587	0.062	0.0487
	(1.2)	(1.4)	(1.4)	(1.5)	(1.4)
(After-listing shares/shares issued) %* D1*D2		0.286			
		(4.2)			
(After-listing shares/shares issued) %* D1*D3	0.2698				
	(4.9)				
(After-listing shares/shares issued) %* D1*D2*D3			0.286	0.3013	0.2398
			(4.2)	(2.9)	(7.7)
D1 -Investors sell shares within months a listing	-0.0384	-0.0249	-0.0249	-0.0434	-0.0093
	(-1.6)	(-1.2)	(-1.2)	(-1.7)	(-0.5)
D2 - Positive drift in share price after the listing		-0.2606	-0.2075	-0.2138	-0.2053
		(-5.3)	(-4.5)	(-4.5)	(-4.5)
D3 - Underpriced IPO	0.5297		0.1551	0.1713	0.1267
	(20.1)		(2.6)	(2.7)	(2.0)
Log (commission)	0.0083	0.0085	0.0085	0.0103	0.0094
	(1.8)	(1.8)	(1.8)	(2.4)	(2.3)
Log (portfolio value)	0.0024	0.0023	0.0023	0.0015	0.0019
	(1.2)	(1.2)	(1.2)	(0.8)	(1.0)
Previous IPOs of possible	0.1996	0.2351	0.2351	0.2691	0.2274
	(0.6)	(0.8)	(0.8)	(0.9)	(0.8)
Previous buy-and-hold of possible	-0.002	-0.0072	-0.0072	-0.007	-0.0061
	(-0.1)	(-0.3)	(-0.3)	(-0.3)	(-0.2)
Previous flipping of possible	-0.0172	-0.0167	-0.0167	-0.011	-0.0194
	(-0.5)	(-0.5)	(-0.5)	(-0.4)	(-0.6)
Financial institution dummy	0.0703	0.0641	0.0641	0.0644	0.0611
	(1.1)	(0.9)	(0.9)	(0.9)	(0.9)
Log (market value)	-0.3003	-0.0983	-0.0636	-0.0656	-0.0599
	(-16.8)	(-9.6)	(-11.5)	(-11.4)	(-15.9)
BV / MV equity	dropped	dropped	dropped	dropped	dropped
Offer price	-0.009	-0.0016	-0.0023	-0.0025	-0.002
	(-12.4)	(-1.8)	(-2.9)	(-3.1)	(-2.5)
VC backed dummy	-0.4496	0.6022	0.5567	0.5428	0.6072
	(-17.2)	(-16.6)	(7.0)	(6.5)	(7.4)
High-tech dummy	-1.0434	-1.0831	-0.8529	-0.8437	-0.8859
	(-12.7)	(-16.8)	(-8.8)	(-8.5)	(-9.6)
First day return	dropped	dropped	dropped	dropped	dropped
Company and year dummy	yes	yes	yes	yes	yes
Observations (IPO allocations)	1,016	1,016	1,016	1,016	1,016
-of which are laddering investors	357	195	195	145	217
Adjusted R -squared	38.3%	37.0%	34.5%	36.2%	37.9%
Investors sell within months of listing	all 6m.	all 6m.	all 6m.	50% 3m.	50% 6m.

Table 5
After-listing Purchases in Past IPOs Give More Future IPO Ownership

This table reports the coefficients and heteroscedastic consistent t -statistics (errors adjusted for clustering across firms Rogers, 1993) in parentheses for the regressions with (allocated shares/issued shares) % as the dependent variable. This is a standard OLS model. All variables are as described in Table 2 and Table 3. Regression 1 includes all IPOs. Regression 2 and 3 includes hot and cold IPOs respectively. There are 171, 105 and 45 IPOs in regression 1, 2 and 3. Regression 4 to 6 drop all company specific control variables. Past laddering includes only investors who have purchased more shares right after the listing and then sold some of the shares within six months of the listing date in past IPOs.

	(Allocated shares/shares issued) %					
	Reg 1	Reg 2	Reg 3	Reg 4	Reg 5	Reg 6
Intercept	-0.12984	0.1096	0.7882	-0.0278	2.0078	0.0587
	(-25.9)	(6.9)	(100.0)	(-7.0)	(90.8)	(10.6)
Previous laddering	0.1114	0.1137	0.0877	0.1114	0.1137	0.0877
	(9.3)	(8.2)	(3.4)	(9.3)	(8.2)	(3.4)
Log (commission)	0.006	0.0051	0.012	0.006	0.0051	0.012
	(4.1)	(3.6)	(8.9)	(4.1)	(3.6)	(8.8)
Log (portfolio value)	0.0085	0.0007	0.0013	0.0009	0.0007	0.0013
	(2.6)	(2.3)	(2.2)	(2.6)	(2.3)	(2.2)
Previous IPOs	0.1535	0.1619	0.1865	0.1535	0.1619	0.1865
	(3.8)	(3.6)	(3.0)	(3.8)	(3.6)	(3.0)
Previous buy-and-hold	-0.0156	-0.0153	-0.0177	-0.01558	-0.0153	-0.0177
	(-7.8)	(-7.0)	(-3.0)	(-7.8)	(-7.0)	(-3.0)
Previous flipping	-0.0022	-0.0051	0.0061	-0.0022	-0.0051	0.0061
	(-0.9)	(-1.9)	(0.9)	(-0.9)	(-1.9)	(0.9)
Financial institution dummy	0.1779	0.1653	0.1807	0.1779	0.1653	0.1807
	(9.5)	(6.9)	(5.3)	(9.5)	(6.9)	(5.3)
Log (market value)	0.0121	-0.008	-0.0357			
	(21.4)	(-9.8)	(-109.1)			
BV / MV equity	-0.0108	0.0474	-0.2327			
	(-2.1)	(10.3)	(-90.3)			
Offer price	-0.0011	-0.001	0.0008			
	(-63.6)	(-32.3)	(64.4)			
VC backed dummy	0.1196	0.0493	-0.2708			
	(29.7)	(5.0)	(-85.9)			
High-tech dummy	-0.1668	-0.44	0.0599			
	(-33.4)	(-42.8)	(27.3)			
First day return	0.4163	0.3627	dropped			
	(16.3)	(12.5)				
Company and year dummy	yes	yes	yes	yes	yes	yes
Observations	175,382	145,392	22,114	175,382	145,392	25,891
Adjusted R -squared	22.0%	21.7%	20.1%	22.0%	21.7%	20.1%
IPOs	all	hot	cold	all	hot	cold

Table 6
Actual Return from After-listing Purchases

This table reports the average USD return for the investors that buy more shares after the listing. Only IPOs with exact IPO allocations are included in the analysis (23 IPOs). First day return $ is calculated as: the number of shares allocated in the IPO * (first day closing price - offer price) * 0.1792 (The NOK/USD exchange rate). First month return $ is calculated as: (The number of shares allocated in the IPO + The shares purchased after the listing) * (Price one month after the listing - first day closing price) * 0.1792 (The NOK/USD exchange rate). Panel A investigate only IPO allocated investors with after-listing buying that sell early in hot IPOs. Panel B investigate only IPO allocated investors with after-listing buying that sell early in IPOs with a positive drift after the listing. Panel C investigate only IPO allocated investors with after-listing buying that sell early in cold IPOs. Panel C includes all IPO trading for the 70 investors that buy more shares after the listing in the cold IPOs. These 70 investors lose money on their cold IPO after-listing purchases, but they earn money in total. Together these investors receive 447 allocations in the sample. Panel D and E investigates non-allocated IPO investors who buy shares after the listing. Panel D investigates the 11 IPOs with high laddering. Panel E investigates the 12 IPOs with low laddering.

Panel A: (IPOs=14)

	First day return $	First month return $	Total return $	Std.Dev.	Investors
All investors	$6,526	$9,197	$15,723	$59,730	357
Institutions	$16,400	$21,866	$38,265	$106,181	92

Panel B: (IPOs=6)

	First day return $	First month return $	Total return $	Std.Dev.	Investors
All investors	$6,712	$15,592	$22,303	$61,822	195
Institutions only	$17,217	$50,733	$67,949	$117,353	40

Panel C:

	First day return $	First month return $	Total return $	Std.Dev.	Allocations
All investors	$17,705	$3,744	$21,449	$167,687	447
Institutions only	$46,297	$13,428	$59,725	$266,893	169

Panel D: The 11 IPOs with high laddering

	Six month return $	Std.Dev.	Investors
All investors	-$5,611	−$139,736	10,748
Institutions only	-$22,189	-$339,564	1,806

Panel E: The 12 low laddering IPOs

	Six month return $	Std.Dev.	Investors
All investors	-$324	−$327,450	6,554
Institutions only	$1,276	$711,068	1,388

Table 7
After-listing Purchases and Generated Brokerage Commissions

This table reports the coefficients and White (1980) heteroscedasticity consistent t-statistics in parentheses for the regressions with the aggregate (after-listing shares/shares issued) % as the dependent variable. All variables are as described in Table 2 and Table 3. All regressions are standard OLS models, and the sample period is from January 1993 to September 2007. Only investors that sell some shares within six months of the listing are included in Aggregate (After-listing shares/shares issued) %. Only investors that do not buy shares after the listing are included in Log (average commission per share). Regression 2 and 4 drop the variables that Hao (2007) and Aggarwal et al. (2006) predict increase laddering. Regression 3 and 4 use average commission by shares instead of the sum of commission scaled by commission in all IPOs.

	Log (aggregate after-listing shares/shares issued) %			
	Reg 1	Reg 2	Reg 3	Reg 4
Intercept	1.5289	1.5296	0.6737	0.3876
	(1.5)	(1.6)	(0.7)	(0.4)
(Combined commission) %	51.5725	44.7781		
	(3.9)	(4.4)		
Log (average commission per share)			0.2172	0.2116
			(1.8)	(1.7)
Log (market value)	-0.0289	-0.03153	0.01	0.0306
	(-0.5)	(-0.5)	(0.2)	(0.5)
BV / MV equity	-0.147	-0.1551	-0.2652	-0.2938
	(-0.5)	(-0.5)	(-0.9)	(-0.9)
VC backed dummy	-0.4901	-0.6445	-0.505	-0.5339
	(-1.5)	(-2.3)	(-1.5)	(-1.7)
High-tech dummy	-0.2395	-0.2797	-0.1333	-0.1139
	(-0.7)	(-0.9)	(-0.4)	(-0.3)
Absolute price revision	-0.0305		-0.0044	
	(-0.2)		(-0.2)	
Sentiment investors (million)	0.0000		0.0001	
	(-0.3)		(2.2)	
Observations	171	171	171	171
Adjusted R -squared	7.8%	7.4%	4.7%	4.1%

Table 8
Relationship between After-listing Purchases and IPO Allocations -Robustness

This table reports the coefficients and heteroscedastic consistent t -statistics (errors adjusted for clustering across firms Rogers, 1993) in parentheses for the regressions with (allocated shares/issued shares) % as the dependent variable. This is a standard OLS model. Only the 23 IPOs with exact allocations are included. All variables are as described in Table 2 and Table 3. In regression 1 all PCC (savings banks) are included. In regression 2 IPO allocations are trimmed at 0.1%.

Intercept	1.5432	1.0574
	(14.3)	(2.8)
(After-listing shares/shares issued) %	0.0772	0.249
	(1.9)	(4.6)
(After-listing shares/shares issued) %* D1 *D2 *D3	0.2674	0.5255
	(3.7)	(1.7)
D1 -Investors sell shares within six months a listing	-0.0201	-0.0326
	(-1.1)	(-0.6)
D2 - Positive drift in share price after the listing	0.1242	-0.1165
	(7.6)	(-1.6)
D3 - Underpriced IPO	-0.1832	-0.4437
	(-15.0)	(-5.5)
Log (commission)	0.0093	0.029
	(2.5)	(2.1)
Log (portfolio value)	0.0035	0.0005
	(2.0)	(0.1)
Previous IPOs of possible	0.0171	0.0135
	(0.1)	(0.0)
Previous buy-and-hold of possible	-0.004	0.0311
	(-0.2)	(0.6)
Previous flipping of possible	-0.0346	-0.0602
	(-1.1)	(-1.3)
Financial institution dummy	0.1086	0.4664
	(1.5)	(1.7)
Log (market value)	-0.0779	-0.0727
	(-19.2)	(-4,2)
BV / MV equity	0.0331	dropped
	(6.3)	
Offer price	0.0002	0.0152
	(1.4)	(11.4)
VC backed dummy	0.7644	-0.4935
	(23.7)	(-4.8)
High-tech dummy	0.3245	0.4879
	(12.8)	(7.2)
First day return	dropped	dropped
Company and year dummy	yes	yes
Observations (IPO allocations)	1,251	1,064
-of which are laddering investors	209	200
Adjusted R -squared	34.2%	31.6%
Investors sell within months of listing	all 6m.	all 6m.

Table 9
IPO Allocations and After-listing Purchases -Robustness 2

This table reports the coefficients and heteroscedastic consistent t -statistics (errors adjusted for clustering across firms Rogers, 1993) in parentheses for the regressions with (allocated shares/issued shares) % as the dependent variable. This is a standard OLS model. Only the 23 IPOs with exact allocations in the sample period are included. All variables are as described in Table 2 and Table 3. All IPO specific control variables are removed.

	(Allocated shares/shares issued) %			
	Reg 1	Reg 2	Reg 3	Reg 4
Intercept	-0.3023	0.3133	0.2943	-0.2871
	(-2.2)	(1.5)	(4.2)	(-1.4)
(After-listing shares/shares issued) %	0.054	0.0486	0.0587	0.0587
	(1.4)	(1.2)	(1.4)	(1.4)
(After-listing shares/shares issued) %* D1	0.1306			
	(1.7)			
(After-listing shares/shares issued) %* D1 *D2			0.286	
			(4.2)	
(After-listing shares/shares issued) %* D1 *D3		0.2698		
		(4.9)		
(After-listing shares/shares issued) %* D1*D2 *D3				0.286
				(4.2)
D1 -Investors sell shares within 6m. a. listing	-0.0283	-0.0384	-0.0249	-0.0249
	(-1.3)	(-1.4)	(-1.2)	(-1.2)
D2 - Positive drift in share price after the listing			-0.6103	0.5593
			(-6.4)	(24.9)
D3 - Underpriced IPO		-0.6049		-0.5883
		(-9.0)		(-8.9)
Log (commission)	0.0096	0.0083	0.0085	0.0085
	(2.2)	(1.8)	(1.8)	(1.8)
Log (portfolio value)	0.0018	0.0024	0.0023	0.0023
	(0.9)	(1.2)	(1.2)	(1.2)
Previous IPOs of possible	0.2085	0.1996	0.2351	0.2351
	(0.7)	(0.6)	(0.8)	(0.8)
Previous buy-and-hold of possible	-0.0046	-0.002	-0.0072	-0.0072
	(-0.2)	(-0.1)	(-0.3)	(-0.3)
Previous flipping of possible	-0.0207	-0.0172	-0.0167	-0.0167
	(-0.6)	(-0.5)	(-0.5)	(-0.5)
Financial institution dummy	0.0743	0.0703	0.0641	0.0641
	(1.1)	(1.1)	(0.9)	(0.9)
Observations (IPO allocations)	1,016	1,016	1,016	1,016
-of which are laddering investors	427	357	195	195
Adjusted R -squared	35.2%	38.3%	37.0%	37.0%

Table 10
Aggregate IPO Laddering and Allocations

This table reports the aggregate allocation and laddering at the IPO level. Panel A includes the 11 high laddering IPOs. Panel B includes also the 12 low laddering IPOs.

Panel A					
Group	Investors	Allocation	Laddering	Total	IPOs
D1	363	3.6%	6.2%	9.8%	11
D1, D3	317	3.5%	6.3%	9.8%	9
D1, D2	174	4.5%	8.7%	13.2%	4
Panel B					
D1	427	2.5%	3.5%	6.0%	20
D1, D3	357	2.5%	4.5%	7.0%	14
D1, D2	195	5.9%	3.2%	9.1%	6

Figure 1
The Factors that Create the Incentives to Engage in IPO Laddering

Laddering investors are allocated some shares in the IPO and then they buy more shares after the listing before they sell all shares. Commission investors are investors that generate high levels of brokerage commission to the investment bank through trading in other shares. Investment bank is the lead manager in the IPO. Hot and cold IPOs are high and low oversubscribed IPOs. Hot and cold IPOs are proxied for by positive and non-positive first day return.

	Hot IPOs	
Laddering investors	Agree to buy more shares after the listing to increase current hot IPO allocations	Pulliam and Smith (2000) and the SEC litigation releases
Commission investors	Pay increased brokerage commissions to the investment bank, through trades in other shares, to increase current and future hot IPO allocations	Reuter (2006) and Nimalendran, Ritter and Zhang (2006)
Investment banks	1) Increase received commissions by allocating IPO shares to laddering investors and commission investors	Hao (2007)
	2) Ensure a successful IPO by allocating shares to laddering investors that increase prices after the listing	Hao (2007)
	Cold IPOs	
Laddering investors	Agree to buy more shares after the listing to increase future hot IPO allocations	Griffin et al. (2007)
Investment banks	1) Ensure a more successful IPO by allocating shares to laddering investors that increase prices after the listing	Griffin et al. (2007) and Hao (2007)
	2) Reduces after-listing price uncertainty by allocating shares to laddering investors	Griffin et al. (2007)
	3) Reduces the risk of damaged reputation from IPOs that fall in price by allocating shares to laddering investors	Griffin et al. (2007)

Figure 2
Theoretical Predictions By Hao (2007) and Aggarwal et al. (2006)

Predictions made by Hao (2007)*

Laddering will increase the following variables: (Tested in Table 8)

1) Laddering results in a higher offer price if the investors are not expected to sell shares in the immediate after-listing (six m.)

2) Laddering is positively related to money left on the table. Investors must have a monetary incentive to buy the shares.

3) Laddering in itself does not necessarily increase underpricing. Both offer and the closing price are positively related to laddering.

4) Laddering contributes to long-run underperformance.

The following variables will increase laddering: (Tested in Table 7)

5) More expected underpricing (without laddering) leads to more laddering

6) When there are information momentum effects where positive initial returns induce more information there is more laddering.

7) When underwriters shares in on the profits from underpriced IPOs, the incentives to engage in laddering are increased.

Predictions made by Aggarwal et al (2006)*

Laddering will increase the following variables: (Tested in Table 8)

1) Returns should be higher for IPOs with laddering than for IPOs with no laddering over the six months after the listing

2) The long-run return should be lower for IPOs with laddering than for IPOs with no laddering

3) The number of sentiment investors increases IPO underpricing for IPOs with laddering.

4) Turnover and volume (shares traded) are greater for IPOs with laddering than for IPOs with no laddering

The following variables will increase laddering: (Tested in Table 7)

5) Underpricing is higher for IPOs with laddering than for IPOs with no laddering

6) When there are more sentiment investors there is a bigger likelihood of laddering

Major Differences

1) Hao (2007) predict intentional underpricing, and Aggarwal et al. (2006) predict price run ups that are corrected in the long-run

2) Hao (2007) and Aggarwal et al. (2006) predicts that laddering increases offer and closing prices and underpricing respectively

Figure 3
Timeline of the IPO Allocations for the Different Groups

Listing in database is when the company list ownership records in the ownership database. This is when the ownership records are observed in the data the first time. IPO allocation is when the companies distribute the allocated shares in the ownership database. Listing is when the company is listed publicly. After-listing purchases is when the laddering trades are calculated. Group 1 to 3 is the ordering of the group of detail in the allocations. Group 1 is 100% accurate IPO allocations. Group 2 IPO allocations includes one to 30 days of after-listing trading. Group 3 IPO allocations includes existing owners who have not sold all of their shares in the IPO. There are 23, 143 and 5 companies in group 1, 2 and 3 respectively.

Timeline of the listing	Six months before the listing	One month before the listing	Listing month	One month after the listing
Group 1	Listing in database	IPO allocation	Listing	After-listing purchases
Group 2	Listing in database		IPO allocation Listing	After-listing purchases
Group 3	Listing in database IPO allocation		Listing	After-listing purchases

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