

Does Stabilisation by Means of Initial Short Covering Help IPOs to Perform Well During the First Days of Trading?*

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Abstract

The greenshoe option has become very popular in the German IPO market since its introduction in 1995 and is nowadays an important tool in issuing additional shares and for the underwriter to cover the short position arising from initial overallotment. We provide evidence that prize stabilisation due to secondary market purchases seems not to be very effective in propping up secondary market prices. Additionally, investors seem to decide quite early which firms are ‘losers’ and which are ‘winners’ in terms of stock market performance.

JEL Classification: G10, G12, G24, G32

Key Words: Initial Public Offerings (IPO), Price Support, Overallotment Option, Greenshoe Option

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1 Introduction and Literature Review

The analysis of initial public offerings (IPO, hereafter) has been a major stream of research in corporate finance for over 30 years. Most research focuses on the explanation of underpricing, hot-issue-markets or long-run underperformance (for an overview see Ljungqvist, 2004). Recently, researchers have discovered another field, which has received little attention due to lack of data and lack of transparency. This is the issue of underwriters supporting or stabilizing IPOs in the secondary market and thereby influencing IPO price performance in circumstances where the market price would decline without intervention (Aggarwal, 2000; Schultz and Zaman, 1994). This argument is in line with the cascade theory discussed by Welch (1992). In the presence of negative price signals, potential buyers could change their mind about purchase in the absence of potential price support and thereby start a negative cascade resulting in further price declines.

Regulators like the Securities Exchange Commission (SEC), the United Kingdom Financial Services Authority (FSA), or the German Federal Financial Supervisory Authority have an interest to allow price support during the first days of trading. One reason frequently stated for their admission is that stabilisation might also be of benefit for individual investors as it prevents further price declines.

Aggarwal (2000) points out that a popular way of supporting IPOs during the first trading days is a combination of initially selling an excess of shares (e.g. 115%) and covering this short position using an overallotment option. This overallotment option, allows the underwriter to buy additional shares (e.g. the 15% supplementary sold) from the issuer at the issue price in order to meet excess demand. If demand is low on the other side and the stock price drops below the offer price the underwriter can, instead of using the greenshoe option,

buy the stock in the secondary market and therefore support the performance of the IPO by increasing demand.¹

Up to now there exists little research on the price support of IPOs due to limits in data availability. One exception is the work by Aggarwal (2000). She analyses 114 IPOs between May to July 1997 given information on each short market transaction, whether penalty bids are part of the contracts and if they have been assessed. This was the first comprehensive analysis of underwriter activities in the secondary market due to this unique dataset. Aggarwal (2000) discusses and analyses 'pure' stabilization, aftermarket short covering and penalty bids and finds that the first type is never performed by the intermediary. This is because SEC regulations require that these transactions are specifically identified. Instead, aftermarket short covering is the primary method of supporting newly issued stocks if they perform worse than expected. Moreover, Ellis et al. (2000) as well as Lewellen (2006) document that underwriter accumulate large inventories of IPO with zero or negative initial return during the first trading day.

Unlike these researchers, due to a lack of data, most authors have had to estimate which IPOs are supported in the aftermarket or use indirect measures to identify stabilizing activities. Ruud (1993) bases her findings on the skewed distribution of the initial returns following the public offer and argues that relatively few IPOs fall below the offer price during the first day of trading due to underwriters stabilizing IPOs during the first 4 weeks of trading. Schulz and Zaman (1994) split their sample of 72 issues in 1992 into 'hot' (i.e. trading above the offer price) and 'cold' (i.e. trading below the offer price) IPOs. They document that underwriters spend 86.1 % of the time at the inside bid² for 'cold' issues but only 63.1 % of the time for 'hot' issues.³ They conclude that without this the bid-ask-spread would widen

¹ The overallotment option is also known as the greenshoe option, named after the Greenshoe Manufacturing Company which was the first firm to go public using this type of a call option.

² The inside bid is referred to the highest bid any trader will pay for the stock.

³ A test for a difference in proportions between 'hot' and 'cold' IPOs yields a t-statistic of 3.64.

considerably in weak offerings. Additionally, underwriters repurchase a surprising 20 % of their underwritten shares during the first three days of trading.

But who benefits from price support in the secondary market? Aggarwal (2000) points out that price support can reduce sales pressure created by flipping activities (i.e. investors who sell the stocks after a very short holding period) and is therefore beneficial for initial investors. As noted by Jenkinson and Jones (2005) it might also be possible to direct stabilisation bid to certain clients like institutional investors. This is possible where the counterparty identity is disclosed or where anonymous orders, by their size, are likely to come from certain types of investors. Benveniste et. al. (1998) point out that underwriter benefit from price support either directly by achieving profit or indirectly by gaining a good reputation (see also Aggarwal, 2000; Smith, 1986). Nanda and Yun (1995) are able to document while analysing 1,331 offerings for the period 1988 and 1991 that for IPOs with an initial return of minus 5 % the lead underwriter's stock experienced a negative price return of minus 0.92 %. Finally, Tinic (1988) argues that aftermarket support minimizes legal liability. This is due to the possibility of legal liabilities on underwriters if an IPO results in initial or continuing negative returns.

Therefore, there appear to be a number of reasons for underwriters to support an IPO in the secondary market. Furthermore, Franzke and Schlag (2002) stress that the greenshoe option has become very popular in Germany and is nowadays included in nearly all initial offerings. As this tool for supporting IPOs dominates not only the German New Issue Market it is interesting to analyse its effect on the short run performance of IPOs during the first weeks of trading. This is especially interesting as underwriters are not supporting IPOs free of charge.

In order to provide evidence on the stock price impact of price support using the greenshoe-option we analyse the behaviour of buy-and-hold returns of IPOs with initial returns during the first trading day below five percent. We break these IPOs down into groups

where the greenshoe option has been used (i.e. ‘GS used’), has not been used (i.e. ‘GS not used’) or has not been announced before the IPO (i.e. ‘no GS announced’). We restrict this analysis to the first 20 trading days as European Union law limits the stabilisation period – similar to the FSA – to 30 days (EU order No. 2273/2003). Moreover, Aggarwal (2000) notes that the average duration of the greenshoe option for the US is 14 days even if the SEC does not restrict the stabilisation period.

Our results show that the greenshoe option is not very effective in propping up aftermarket prices. Additionally, the market seems to decide quite early which firms are ‘losers’ and which are ‘winners’ in terms of stock market performance. This evidence favours Welch’s (1992) informational cascade theory, as even price support does not help underperforming IPOs to do well. We use different firm characteristics and stock market information to assess first, the probability that an IPO needs to be price supported by the underwriter (i.e. regressions (1) and (2)) and second, that the price support is successful by the underwriter and the company performs well in the secondary market (i.e. regression (3)).

The remainder of this paper is organized as follows. Section 2 describes the data set and provides the empirical analysis for the effectiveness of the overallotment with regard to price support by the underwriter. This section is divided into descriptive statistics (section 2.2.1), parametric and nonparametric tests (section 2.2.2) and regression analysis (section 2.2.3). Section 3 concludes the paper.

2 Empirical Analysis

2.1 Sample Description

We analyse the period 1997-2002 and all initial listings on the Frankfurt Stock Exchange across different stock market segments. The overallotment option was used in the IPO process in Germany for the first time in 1995, but before 1997 most information on the usage of the

greenshoe was missing. We exclude companies that were traded on a different stock market before going public on the Frankfurt Stock Exchange, due to missing ex-ante uncertainty about the company's prospects. Whilst, 427 IPOs fulfilled our initial requirements, we could obtain data on the usage of the greenshoe option for 415 firms and data on the explanatory variables for 414 firms, the size of our regression sample.

As there are different but not always reliable compilations of Initial Public Offerings in Germany we use the web page and the Factbooks of the Frankfurt Stock Exchange and double check our list using the company's homepage or investor relations department, newspaper articles, the IPO database of the newspaper 'Börsenzeitung', and of OnVista AG. The information concerning the earnings of the company in the year prior to the IPO are taken from the web-page of Blättchen AG. The information on the remaining explanatory variables (see Table III for details) are taken from the IPO prospectuses, the web pages of the 'Börsenzeitung' and OnVista AG, the company's web pages, investor relations departments, ad-hoc information services. The secondary market prices and daily quotation for the Nemax-All-Share index are obtained from the KKMDB database at the University of Karlsruhe and Datastream, respectively.⁴ This is, we believe, the first comprehensive database for the usage of the greenshoe option in Germany.

2.2 Analysis of the Price Support

2.2.1 Descriptive Statistics

In order to analyse the impact of price support we are going to have a closer look at those IPOs which are commonly supposed to be price supported in the secondary market by the underwriter. The literature generally assumes that IPOs which trade below or at the offering price are supported by the underwriter. Aggarwal (2000) on the other side points out that IPOs which trade slightly above the offer price are as well supported by the underwriter who is

⁴ We thank Hermann Göppl for providing the data.

acting to reduce the risk of dropping below this important bound and therefore uses the 5 % value as cut-off point. We follow her analysis and classify IPOs which trade below 5 % during the first day of trading as potentially price supported. In order to accommodate this selection process we use the initial return, IR_t , calculated as follows:

$$IR_t = \ln \left(\frac{P_t}{P_{offer}} \right)$$

where P_t represents the stock price at time t and P_{offer} the offer price. Contrary to most other studies we use both the first day opening (i.e. IR_0) and the first day closing price (i.e. IR_1). Focusing, as is normally done, solely on the first day closing price may lead to excluding some price-supported firms. Firms which start poorly may already be supported during the first day of trading and therefore be priced above this boundary by the end of the first day. The chosen procedure is supported by the findings of Lewellen (2006) for the US stock market, as she shows that 54 % of stabilising purchases took place during the first trading day. Table I summarises the descriptive statistics of the analysed sample.

Please insert Table I around here

It can be seen from Table I that 187 IPOs exhibit an initial return below 5 % and are therefore potentially subject to price support by the underwriter. The greenshoe option has not been exercised in all IPOs during 2001 and 2002 and therefore the underwriter had to buy the additionally issued shares in the secondary market. Due to this the underwriter was supporting the stock price. Moreover, during this period, which was characterised by little IPO activity and poor long run performance, no company was brought to the market without an overallotment option. Therefore the underwriter had the possibility to support the IPO through buying stock in the secondary market after the float.

Most research on IPOs assumes that due to asymmetrically distributed information the IPO can not be sold for the true market value but only with a discount. It is further argued that this is the main reason for the observable initial return (see e.g. Ljungqvist 2004). In order to control for ex-ante uncertainty in our regressions we control for the age of the company, issue volume, earnings, bookbuilding range and bookbuilding days (see Table III for the calculation of the variables). The earnings of the companies, which following the argument of Beatty and Ritter (1986) should proxy for ex-ante uncertainty caused by informational disadvantages of the investors, were lowest during the bubble period 1998 and 1999 and increased thereafter. This shows that profitability seems to be more important for selling the issue to the public in the latter period. Moreover, a longer subscription period and higher bookbuilding range can be interpreted as higher ex-ante uncertainty about the true firm value of the company (see e.g. Jenkinson et al. 2005). Therefore, we assume that these firms are expected to be supported by the underwriter during the first days of trading.

The return of the Nemax-All-Share-Index is calculated for a 30 day window prior to the IPO and it can be observed that the average market return is lower for IPOs with an initial return above the 5 % boundary. The number of IPOs in the prior 30 days is also computed and it can be inferred from Table I that for example in 1999 and 2000 on average 17 and 16 companies went public during this time window, respectively. Moreover, Table I shows that the number of IPOs prior to the considered new issue is higher for firms which performed poorly during the first trading day. We also found that 39 % or 38 % of the companies with an initial return below 5 % belong to the new economy or went public on the stock market segment Neuer Markt, respectively. We will control for these features of the date in our final regression analysis.

Aggarwal (2000) states that most of the time underwriters use short selling in order to support IPOs during secondary market trading. As the gross margin depends on the shares distributed, the only situation in which an underwriter would not exercise the greenshoe

option is if he has to support the IPO through purchasing stocks in the open market. Therefore, the expiration and non-usage of the greenshoe option should affect return patterns. Up to now no evidence existed on the question of whether this prevents the IPO from performing poorly in the secondary market.

Please insert Figure I around here

Inspecting the return pattern of potentially price supported IPOs during the first 20 trading days it becomes apparent that IPOs where the greenshoe has been exercised perform much better than firms where it has not been used. This is quite surprising as the usage of the overallotment option leads to the conclusion that the first group of firms has not been supported by the underwriter, and therefore performs well without intervention. In cases where the underwriters have covered their short position through stock purchases in the secondary market and therefore the IPO has been supported in the secondary market show a clear decreasing trend in returns. This highlights the possible existence of a negative cascade effect as proposed in Welch (1992), as some firms, even with intervention by the underwriter, perform poorly in the secondary market. Lewellen (2006) shows in line with this findings that if a stock opens at the offer price, 6 % of the issued stocks are repurchased by the market-makers before the price is allowed to drop. On the contrary, the market makers only repurchase 2 % if the share opens below the offer price. Therefore, she concludes that underwriters defend the offer price more staunchly than at lower levels. This result is in line with the findings of Boehmer and Fishe (2004) who document that the price impact of a trade involving a stabilization bid is a fifth of that where there is no stabilization activity from the underwriter involved. It is also interesting to note that IPOs with no greenshoe announced show a rather similar return pattern when compared with the firms where the overallotment option has not been used.

2.2.2 Parametric and Non-Parametric Tests

To provide further evidence on the dissimilarity of the displayed return patterns we test if the difference between the returns series for different groups of IPOs, Δ , is significantly different from zero by using both the non-parametric Mann-Whitney U test and the parametric t-test. The latter test assumes that the underlying variables are normally distributed and therefore has good statistical power even in small samples. The non-parametric statistical tests on the other hand require less restrictive assumptions concerning the distributions of the variables and the variances of comparison groups. However, this test has two major disadvantages. First, one loses the metric and numerical values of the results, since only the ranks, not the numerical values are used. Second, when the sample size is small, one can lose considerable statistical power compared to using a parametric test. Nevertheless, the presentation of both should provide comprehensive evidence. Δ is calculated as follows:

$$\Delta = \sum_{t=1}^n IR_t^a - \sum_{t=1}^n IR_t^b$$

where IR_t represents the initial return for the first 20 trading days and the variables a and b represent the different series (i.e. ‘GS used’, ‘GS not used’ and ‘no GS announced’) to be compared with each other.

Please insert Table II around here

The results of Table II show, that all series are significantly different from each other, even at the one percent level. This again shows that IPOs which are supported by the underwriter behave differently to those which do well without being supported even if they start trading slightly above or below the offer price, too. Therefore, we have to conclude that the market decides quite early which firms are worth buying and which are not. This, as a

result casts doubt on the effectiveness of price support activities. Besides this, price support activities are expensive to the issuer, even though they do not seem to be effective.

2.2.3 Regression Analysis

To further enhance our analysis we run two sets of regressions. The first group consists of Regression (1) and (2) and analyses the effect of different firm characteristic and also the effect of the stock market and previous IPO activity on the probability that the initial return is below our boundry. Regression (3) on the other side analyse the probability of IPOs migrating from the price supported group to the group of IPOs which do well in the secondary market. Table III gives an overview of the explanatory variable as well as the expected sign given the findings in the literature (for an overview see Ljungqvist 2004; Ritter and Welch 2002). These results are robust. They do not change significantly if we use 0 % initial return as the cut-off point instead of the 5 %.

Please insert Table III around here

In order to analyse the effect of different explanatory variables on the grouping of IPOs we use a logit regression where the dependent variable takes the value one if the firm shows an initial return below 5 % and zero otherwise. The first group is, given the argument above, commonly assumed to be supported by the underwriter.

The age of the firm (*age*), has a positive effect and implies that older companies are more likely to depend on price support by the underwriter than younger companies. This is against the predictions of Beatty and Ritter (1986) that older firms show less ex-ante uncertainty due to a longer track record. The inverse of the issue size (*invsize*) has a positive and significant impact, this implies that smaller firms are more likely to perform poorly during the first trading day. Additional proxies for uncertainty bookbuilding range (*bbr*) and bookbuilding

days (*bbd*) which both have a positive effect and imply that more uncertainty about the firm's value increases the probability of the company do perform poorly during the first trading day. The prior performance of the market return (*nemax*) is highly significant with a coefficient of -5.44 and shows the important effect of the overall stock market for the short run performance of IPOs. Moreover, if many firms have gone public before the considered offering the probability increases that the IPO needs to be supported by the underwriter (*volume*). This also can be interpreted as evidence that the capacity of the market is limited. Ljungqvist and Wilhelm (2003) show, for the US stock market, that the New Economy has an important impact in explaining the initial return during the first trading day. We can neither confirm nor reject their findings as our dummy lacks significance. Whereas, the dummy *neuermarkt* is highly significant and shows a negative coefficient. Therefore, going public on this stock market segment increases the probability that at least during the short run the firm will perform well and indirectly supports the notion of Cornelli et al. (2005) that the initial return depends on the sentiment of investors.

Please insert Table IV around here

In a more dynamic setting we analyse the probability of an IPO migrating from the price supported group to the group which is not supposed to be backed up by the underwriter. To achieve this we run a logit-regression where the dependent variable takes the value one if the IPO shows an initial return of below 5 % and subsequently trades at least 17 days above this separation point.⁵ Therefore, the stock is only allowed to drop occasionally below the boundary of 5%. This should proxy for the effect that underwriter manage to successfully

⁵ If we use 15, 16, or 18 days instead of the 0 % return value as cut-off point the results do not change significantly. Moreover, the results of regression (3) do not change significantly if we use the dummy *neuermarkt* instead of the dummy *neweconomy*.

support the IPO during the first days of trading and during the duration of the Greenshoe Option.

The results from regression (3) show that the probability of performing well over time once they have started poorly decreases with number of issues rise. This is consistent with the idea that it should be *ceteris paribus* more complicated for the underwriter to support IPOs where many stocks have been issued. It would also be more expensive. Moreover, we find that the migration of the firms do not depend on the performance of the stock market and therefore on the market sentiment. Besides this, the non-usage of the Greenshoe Option does not increase the probability of performing well in the secondary market, confirming what we see in Figure I.

3 Conclusion

As the overallotment option has become very popular in Germany and is nowadays included in nearly every new issue, we analyse the effectiveness of this tool and its impact on the return pattern during the first trading days for the first time.

We find that price support, by means of the non usage of the greenshoe option, does not seem to be very effective in pushing up the stock price above the issue price. In line with Arosio et. al. (2000), we therefore have to conclude that some IPOs are immediately pointed out by investors as a not profitable investment and consequently do not benefit from price support. It seems, by analyzing the return patterns, that the market decides quite early which stocks are worth buying and which not. We also find that uncertainty about the issue increases the probability that an IPO will depend on price support by the underwriter.

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Table I
Descriptive Statistics

The sample covers the 1997 – 2002 period and 414 IPOs. The initial return (IR_t) is calculated as $\ln(P_t/P_{offer})$, where P_0 and P_1 represent the opening and closing price at the first trading day, respectively and P_{offer} is the offer price at the end of the bookbuilding period. IR below 5% refers to IPOs with an initial return (IR_0 or IR_1) below five percent. ‘GS used’ and ‘GS not used’ refers to the situation in which the greenshoe (GS) option has been exercised and not exercised, respectively. For some IPOs no overallotment option has been announced in the prospectus and given this have been labelled ‘no GS announced’. Earnings are calculated for the year prior to the IPO. Issue volume is the number of issued shares at the IPO date multiplied by the issue price. Age is calculated as the time period between the foundation of the company and its issue date. If the firm has gone through mergers or restructuring prior going public, the foundation date of the oldest predecessor has been chosen. Bookbuilding days are calculated as the difference between start and end of the subscription period. The width of the bookbuilding range represents the difference between the upper and lower bound divided by the midpoint. The return of the Nemax All Share index is calculated as holding period returns for the 30 days prior to the IPO. Average number of prior IPOs refers to the number of firms which went public during 30 days prior to respective IPO. The industry groups media, pharma&health, software, technology, and telecommunications represent the new economy. Neuer Markt represents IPOs which went public on this stock market segment.

		1997	1998	1999	2000	2001	2002	1997-2002
	Number of firms	18	63	165	149	17	2	414
	IR below 5%	5	21	81	64	14	2	187
IR_0	All IPOs	36.25%	61.34%	37.96%	41.70%	7.04%	2.16%	41.35%
	IR below 5%	1.00%	2.58%	0.25%	-0.10%	-0.82%	2.16%	0.35%
IR_1	All IPOs	35.06%	63.48%	40.89%	43.65%	5.32%	2.03%	43.42%
	IR below 5%	0.15%	1.98%	-0.40%	-0.85%	-3.42%	2.03%	-0.47%
GS used	All IPOs	12	39	101	95	6	1	254
	IR below 5%	3	11	32	21	3	1	71
GS not used	All IPOs	1	6	48	45	11	1	112
	IR below 5%	0	6	42	37	11	1	97
no GS	All IPOs	5	18	16	9	0	0	48
	IR below 5%	2	4	7	6	0	0	19
earnings (Million €)	All IPOs	14.89	3.15	3.19	6.60	11.69	3.66	5.27
	IR below 5%	3.84	5.91	6.43	15.70	9.44	3.66	9.67
age of companies (years)	All IPOs	38.21	19.96	19.55	12.18	21.10	3.72	17.76
	IR below 5%	53.91	32.95	26.73	13.38	22.56	3.72	23.03
issue volume (Million €)	All IPOs	57.64	49.41	76.02	170.57	133.49	47.00	107.42
	IR below 5%	56.59	65.25	103.75	161.53	91.86	47.00	116.44
bookbuilding range	All IPOs	17.04%	15.71%	17.21%	18.30%	22.18%	17.01%	17.57%
	IR below 5%	15.94%	17.37%	17.93%	19.95%	22.03%	17.01%	18.80%
bookbuilding days	All IPOs	6.17	4.89	5.69	6.38	7.06	12.00	5.93
	IR below 5%	4.80	5.95	6.33	6.80	6.79	12.00	6.50
return of Nemax-All-Share-Index (30 days)	All IPOs	1.03%	1.06%	1.01%	1.01%	0.88%	0.95%	1.01%
	IR below 5%	0.99%	0.99%	0.98%	0.92%	0.84%	0.95%	0.95%
average number of prior IPOs (30 days)	All IPOs	4.22	7.46	17.39	16.79	3.47	0.00	14.44
	IR below 5%	6.00	8.10	18.46	16.28	3.71	0.00	14.91
new economy	All IPOs	10	43	135	132	10	2	332
	IR below 5%	3	8	65	55	8	2	141
Neuer Markt	All IPOs	11	41	130	131	11	1	325
	IR below 5%	2	6	55	52	9	1	125

Figure I Holding period returns and the usage of the greenshoe option

The sample covers the 1997 – 2002 period and 415 IPOs. The initial return (IR_t) is calculated as $\ln(P_t/P_{offer})$, where P_t is the market price at time t , which ranges from 0 (open price at day 1) to 30 (closing price at day 30), and P_{offer} is the offer price at the end of the bookbuilding period. The return pattern of IPOs with an initial return (IR_0 or IR_1) below five percent are shown. 'GS used' and 'GS not used' refer to the situation in which the greenshoe (GS) option has been exercised and not exercised, respectively. For some IPOs no overallotment option has been announced in the prospectus and given this have been labelled 'no GS announced'.

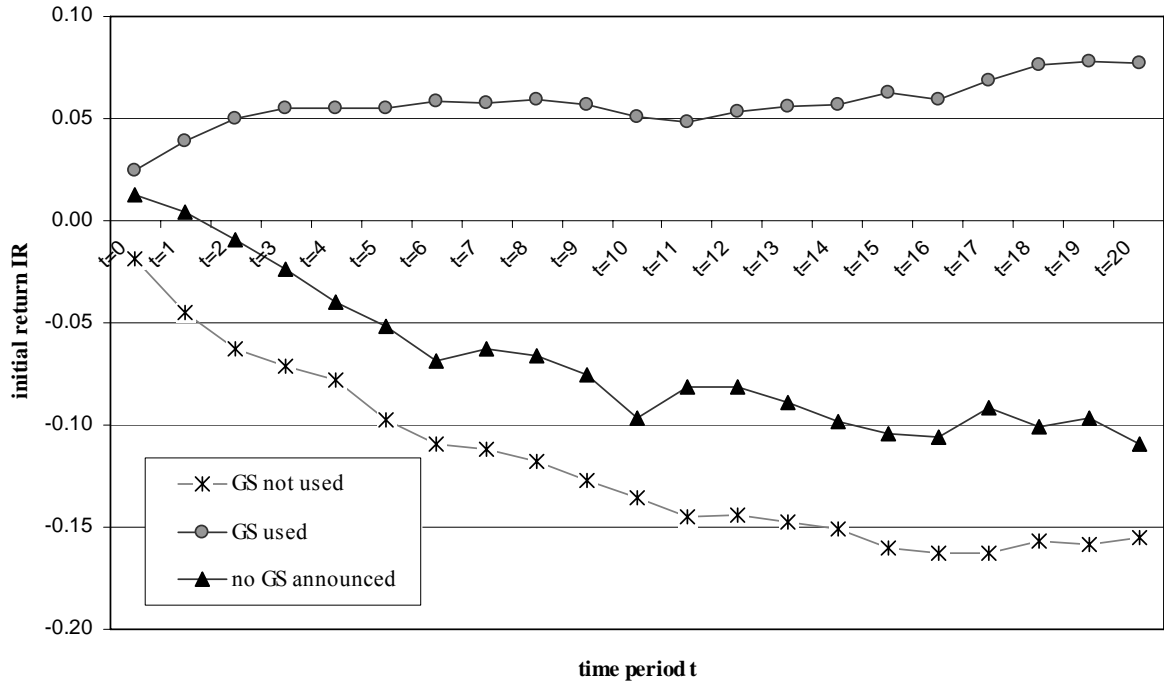


Table II**Statistical difference in holding period returns and the usage of the greenshoe option**

The sample covers the 1997 – 2002 period and 415 IPOs. The return pattern of IPOs with an initial return (IR_0 or IR_1) below five percent are analysed. ‘*GS used*’ and ‘*GS not used*’ refer to the situation in which the greenshoe (GS) option has been exercised and not exercised, respectively. For some IPOs no overallotment option has been announced in the prospectus and

given this have been labelled ‘*no GS announced*’. We test for difference between the series by using $\Delta = \sum_{t=1}^n IR_t^a - \sum_{t=1}^n IR_t^b$,

where IR_t represents the initial return for the first 30 trading days and the variables a and b represent the different series to be compared with each other. The z-value for the non-parametric Mann-Whitney U test and t-statistic for the parametric t-test are reported. ***, ** and * denotes significance at the one percent, five percent and ten percent level, respectively.

	GS not used		no GS announced	
	Mann-Whitney U Test	t-Test	Mann-Whitney U Test	t-Test
GS used	4.86 ***	19.237 ***	4.86 ***	17.3381 ***
GS not used			4.86 ***	-13.3338 ***

Table III
Summary of the explanatory variables

Variable	Definition	Expected sign	
		Reg. (1), (2)	Reg. (3)
gsnotused	Dummy variable coded one if the Greenshoe has <u>not</u> been used and zero otherwise.	Not used	+
earnings	Earnings of the company in the year prior to the IPO	-	+
age	Age (difference between the foundation of the company and the IPO date) of the company going public.	-	+
invsize	Inverse of the company's issue volume (number of issued shares multiplied by the issue price) at the IPO.	+	-
bbr	Width of the bookbuilding range (difference between the upper and lower bound divided by the midpoint).	+	-
bbd	Length of the subscription period (difference in days between the start and ending).	+	-
nemax	Buy-and-hold return of the 'Nemax-All-Share'-Index during 30 days prior to the IPO.	-	+
volume	Number of completed IPOs during 30 days prior to the offering (i.e. IPO cycles).	+	-
neuermarkt	Dummy variable coded one if the IPO went public on the stock market segment 'Neuer Markt' and zero otherwise.	+	-
neweconomy	Dummy variable coded one if the IPO belongs to the new economy and zero otherwise.	+	-

Table IV
Analysis of the difference between IPOs with an IR above and below 5 percent

The sample covers the 1997 – 2002 period and 414 IPOs. The initial return (IR_t) is calculated as $\ln(P_t/P_{offer})$, where P_0 and P_1 represent the open and closing price at the first trading day, respectively and P_{offer} is the offer price at the end of the bookbuilding period. *IR below 5%* refers to IPOs with an initial return (IR_0 or IR_1) below five percent. The dependent variable *migration* takes the value one if the initial returns is below 5 % and the IPO subsequently trades 17 days out of the analysed 20 trading days above this boundary and zero otherwise. The dummy variable *gsnotused* is assigned with the value one if the underwriter did not use the greenshoe option and therefore had to cover the short position through secondary market purchases. *Earnings* are calculated for the year prior to the IPO. *Invsiz* is calculated as the inverse of the number of issued shares multiplied by the issue price. *Age* is calculated as the time period between the foundation of the company and its issue date. If the firm has gone through mergers or restructuring prior going public, the foundation date of the oldest predecessor has been chosen. The variable *bbd* is calculated as the difference between start and end of the subscription period and *bbr* represents the difference between the upper and lower bound of the bookbuilding range divided by its midpoint. The variable *nemax* is calculated as holding period returns for the 30 days prior to the IPO and *volume* refers to the number of firms which went public during 30 days prior to respective IPO. The dummy variable *neweconomy* takes the value one if the IPO belongs to the industry group media, pharma&health, software, technology, or telecommunications and *neuermarkt* takes the value one if the company went public at the stock market segment Neuer Markt. Robust standard errors are presented in brackets. We use ***, **, and * to denote significance at the one percent, five percent and ten percent level, respectively.

No. of Regr. Dep. Variable	(1)		(2)		(3)	
	IR below 5%		IR below 5%		migration	
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.
constant	5.308 **	(2.45)	5.021	(2.52)	-9.524 *	(4.94)
gsnotused					-3.393 ***	(1.14)
earnings	0.002	(0.00)	0.005	(0.01)	0.002	(0.00)
age	0.261 *	(0.14)	0.404 ***	(0.14)	0.027	(0.28)
invsiz	0.320 **	(0.15)	0.354 **	(0.15)	-0.526 *	(0.30)
bbr	0.935 **	(0.40)	1.023 ***	(0.39)	1.298	(0.92)
bbd	0.585 **	(0.27)	0.705 ***	(0.26)	-0.286	(0.52)
nemax	-5.443 ***	(0.84)	-5.278 ***	(0.85)	0.335	(2.30)
volume	0.418 **	(0.20)	0.362 *	(0.20)	0.318	(0.57)
neweconomy			-0.382	(0.28)		
neuermarkt	-1.197 ***	(0.32)			0.852	(0.82)
pseudo R ²	0.188		0.165		0.237	
sample size	413		413		187	