

Initial returns and long-run performance of private equity-backed initial public offerings on the Amsterdam Stock Exchange

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Abstract

This paper investigates the initial returns and long run performance of initial public offerings (IPO) using a sample of 38 private equity-backed IPOs and 68 non-private equity-backed IPOs in the period 1985-1998 on the Amsterdam Stock Exchange. We find that private equity-backed firms outperform non-private equity-backed firms. In tests using several comparable benchmarks, private equity-backed firms show less underpricing than non-private equity-backed firms, however the difference is not significant. The evidence suggests that private equity-backed IPOs do not significantly underperform over a three-year period, while non-private equity-backed IPOs do. This paper also provides initial evidence on the sources of underpricing and underperformance. Evidence is presented that the reputation of the lead manager and the age of the firm have a negative effect on the level of underpricing and that the sales growth rate has a significant positive effect on the long-run performance of IPOs.

Key words : Going public, Private equity-backed issues, Investment banking

JEL Classification: G12, G14 and G32

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1. Introduction

This paper investigates the initial returns and long run performance of initial public offerings (IPO) using a sample of 38 private equity-backed IPOs and 68 non-private equity-backed IPOs in the period 1985-1998 on the Amsterdam Stock Exchange.

Private equity is defined as risk-carrying capital invested in privately held companies. The investment mainly takes place through participation in the shareholders' capital of the firm. Private equity contains both venture and non-venture capital. Private equity has its origins in the United States and was developed in Europe around the second half of the eighties. Low interest rates, a great faith in

the economy, ongoing professionalization of the capital market and the establishment of new stock markets in Europe resulted to a considerable growth of the European private equity market over the last decade.

The process of private equity investment starts with the selection of investment opportunities. After the private equity fund has optimized and managed the firm's growth during its investment horizon, participation is eventually divested. The private equity fund benefits from an increase in firm's share capital at the moment of divestment.

There are several possible exit-routes, such as reselling to the firm or the management, reselling to a financial or a strategic party, and taking the firm to the stock market. The performance of companies divested by means of an IPO is analyzed in this article. The article is organized into the following sections. In Section 2 the theoretical and empirical background on the performance of IPOs are discussed. The sample data and methodology are presented in Section 3. Section 4 provides empirical findings concerning the short-run and long run performance of PEO and non-PEO initial public offerings, as well as initial evidence on the sources of underpricing and underperformance. Section IV outlines concluding remarks.

2. Theoretical and empirical background on the performance of IPOs

2.1. Underpricing

Underpricing is the positive return that a shareholder can achieve when a newly public share is bought at its offering price and sold at its first closing day-price. Almost all theories of underpricing assume

an ex-ante uncertainty for shareholders concerning the quality of IPO firms (Rock, 1986). Because of existing asymmetric-information, it is more difficult for an investor to get a reliable impression of the real value of the share price at introduction. To interest investors for the offering share, the share will have to show a positive return in the first days after its initial offering.

Almost all explanations of the influence of private equity funds on the performance of the IPO firm in the short run are derived from the certification hypothesis. This hypothesis states that the involvement of a private equity fund at a stock introduction has a certification effect concerning the quality of the introduction fund. Certification has economic value only if there is a discrepancy between the perceptions on the value of the company of insiders and outsiders. We consider insiders to be management and other parties that have a profound understanding of the company, and outsiders as the (potential) investors. Insiders are likely to conceal information that may be harmful to the reputation of the company. Negative information will cause investors to adjust their perception of value downward. The total proceeds of the IPO are likely to be higher when negative information is successfully suppressed.

Rational investors realize the possibility to hide negative publicity and will discount the presence of hidden information in their valuations. Therefore, investors are unwilling to pay high average prices for IPO shares. This can be avoided by assuring investors that all relevant information is disclosed. Investors are more likely to believe that all information is disclosed when a third party that has no direct stake in maximizing the proceeds of the IPO, is involved in the IPO. This certifying function will reduce the information asymmetry between insiders and outsiders of the firm. Reduced information asymmetry will lead to less underpricing.

There are three conditions that have to be met in order for the third party to be able to perform a certifying role successfully. The first is that the certifying party has to have its reputation at stake when an IPO is overpriced. Secondly, the loss of a good reputation has to outweigh any possible monetary reward of a false certification. The third condition is that a firm hiring a third party to certify should incur considerable costs doing so. Moreover, third party services cannot be easily replicated.

Private equity funds tend to meet these conditions. The well-established private equity funds are frequently involved with IPOs, and profit from good and long-term investor relations. Successful private equity funds have access to a large investor market, and are attractive investors to companies that aspire to go public in the future. Private equity funds are unlikely to be willing to jeopardize their relationships for a onetime monetary benefit of a false certification. Moreover, they require return on investments for services rendered. These services may include providing the invested amount of money, management and technical expertise, improved access to capital markets and the certifying role when going public.

Barry *et al.* (1990) and Megginson and Weiss (1991) examined the certification hypothesis for the American market. They found that the involvement of a private equity fund at the IPOs leads to less underpricing. Munsters and Tourani Rad (1994) have been unable to determine this certification effect for IPOs in the Netherlands.

The described certification hypothesis can also be applied to the role of the lead manager. Carter *et al.* (1998) find evidence that IPOs which have been introduced by lead managers having a good reputation show less underpricing.

Stoughton and Zechner (1998) suggest that underpricing is the result of moral hazard, which means that underpricing is compensation for the monitor activities conducted by (larger) professional shareholders. Schultz and Zaman (1993) indicate that the amount of underpricing results from the difficult balance between maximization of revenue from the introduction for the issuer of the shares and a positive return for investors. Eijgenhuijsen (1989), Van Hoeijen and Van der Sar (1999), and Loughran and Ritter (1994) show that the offering method of the IPO has an effect on the level of underpricing.

2.2. *Underperformance*

Underperformance is where the difference between the long-run return of the new public company has a lower performance than the benchmark. Numerous studies in numerous countries have confirmed underperformance after one (Aggarwal and Rivoli, 1990), three (Ritter, 1991 and Loughran *et al.*, 1994) and five years (Loughran and Ritter, 1995).

Brav and Gompers (1997) investigated the long-run return for private equity-backed (PEO) and non-PEO initial public offerings. They showed that the PEO public firms perform better than the non-PEO ones. Evidence is presented that the book-to-market ratio at offering-date has a significant influence on the aftermarket performance. Munsters and Tourani Rad (1994) have examined the performances of PEO and non-PEO initial public offerings. Contrary to the above-mentioned research, they find that this does not hold for the Netherlands, as in the Netherlands PEO initial public offerings underperform non-PEO initial public offerings.

Carter *et al.* (1998) not only examined the lead managers' short-run influence, but also studied the long-run influence. IPOs by 'better' lead manager's show less underperformance.

Aggarwal and Rivoli (1990) attribute underperformance to a temporary overvaluation of the IPO firm at the offering date, the so-called 'fads' theory. After a while the over optimism disappears and the value of the new share will be downwardly adjusted. Ritter (1991) has further advanced the fads theory and showed that IPO firms with a high risk profile (*i.e.* younger, smaller and active in certain sectors) are sooner subject to shareholder sentiment; the so called fads of the stock market.

Loughran and Ritter (1995) find evidence that underperformance is the result of the utilization of 'windows of opportunity' by the issuer and the lead manager. Companies go public at the moment of relative overvaluation *i.e.* a high market-to-book ratio. If, after a while those firms do not live up to their expectations, the value will be adjusted downwards. Teoh *et al.* (1998) suggest that companies who are guilty of window dressing, just before going public, show more underperformance in the aftermarket. Based on the provided information investors initially overvalue the issue. If the company is not able to fulfill the expectations after going public, investors will revalue their positions, which will cause the stock price to fall.

In this article, an attempt is made to provide clarity about the above-mentioned contradiction between the short-run and long run performances of private equity-backed IPOs on the American and Dutch stock markets.

3. Data and methodology

3.1. Sample selection

We investigate the performance of initial public offerings on the Amsterdam Stock Exchange using a sample of 38 private equity-backed and 68 non-private equity-backed IPOs during the period 1985-1998. Several criteria are used to select our sample firms. IPOs of investment funds are excluded from the sample because their unique characteristics make them incomparable with other IPOs. IPOs that are the result of a 'reverse takeover' are excluded. Inclusion is also reserved to those IPOs of which a issue prospectus was available (information involving possible private equity backing is traceable through this source). A sample of 106 market introductions remained used to calculate the short-run return. Based on information gathered from the issue prospectuses, 38 initial public offerings were private equity-backed and 68 were not. Table I reports several characteristics of the PEO and non-PEO initial public offerings in the sample.

*** Insert Table 1 about here ***

From the data in table 1 above, it can be concluded that PEO IPOs are generally related to smaller introductions of younger and smaller companies (with regards to market value) with a lower book-to-market than non-PEO initial public offerings.

3.2. Short-run return

To determine the level of underpricing for 106 IPOs from 1985-1998, the initial (abnormal) return is calculated.

The equation for calculating the abnormal return from IPO firm i over a period t is as follows:

$$ar_{i,t} = r_{i,t} - r_{m,t} \tag{1}$$

In equation (1) $r_{i,t}$, the return of a firm i on day t is calculated by the difference between the offering price $ip_{i,0}$ and the first closing price $p_{i,t}$ as a percentage of the offering price, that is:

$$r_{i,t} = \frac{p_{i,t} - ip_{i,0}}{ip_{i,0}} \quad (2)$$

The market return for the same period t is signified with $r_{m,t}$. To calculate the market return the Central Bureau of Statistics (CBS) share price index and the Amsterdam Exchange Midcap (AMX) share price index is used as a benchmark.

3.3. Long-run return

Underperformance is determined by calculating cumulative abnormal returns and the wealth relative factor (Ritter, 1991). For this purpose 75 initial public offerings in the period of 1985 till 1995 were used. Of these 75 companies, 28 received private equity backing and 47 did not. To incorporate the effect of market tendencies the CBS all shares index, the CBS all shares index minus Royal Dutch Petroleum and the AMX index were used as benchmarks.

The cumulative abnormal return (CAR) of a portfolio with n IPOs is determined by changes in total return of the portfolio over a period of s months. For each initial public offering the monthly abnormal return was calculated using equation (1) and (2). For this purpose $ip_{i,0}$ was replaced by $p_{i,t-1}$. The average abnormal return of n initial public offerings in month t is equal to:

$$AR_t = \frac{1}{n} \sum_{i=1}^n ar_{i,t} \quad (3)$$

The average cumulative abnormal return over a period s is as follows:

$$CAR_{t,s} = \sum_{t=1}^s AR_t \quad (4)$$

If a share is delisted, the portfolios return for the following months are equally divided among the remaining funds. During the investigated period five funds were delisted. A CAR-value of -12 percent signifies that the portfolio with n initial public offerings over a period of s month had a return of 12 percent below the benchmark.

In addition to CAR, the wealth relative ratio was used to evaluate the aftermarket performance, (Ritter,1991). The return of initial public offering i is calculated for a buy-and-hold investment strategy. This investment strategy presumes that an initial public offering is received at the first closing price and is kept in the portfolio over a period of s months. The buy-and-hold total return for firm i over a period of s months, is calculated as follows:

$$R_{i,s} = \prod_{t=1}^s (1 + r_{i,t}) - 1 \quad (5)$$

The average return of the portfolio with n initial public offerings over a period s months then equals:

$$R_s = \frac{1}{n} \sum_{i=1}^n R_{i,s} \quad (6)$$

The average return of the portfolio R_s , with n initial public offerings against an average market return R_m is calculated with the wealth relative ratio:

$$WR = \frac{1 + R_s}{1 + R_m} \quad (7)$$

The average return R_m of the benchmark is determined in the same way as the average return of portfolio R_s . A WR -ratio larger than 1 implies that the IPO firms have on average a better performance than the benchmark, while a WR -ratio smaller than 1 indicates underperformance in comparison to the benchmark.

4. Empirical findings

4.1. Underpricing

Table 2 presents the short-run returns for the full sample, non-PEO and PEO IPOs. The average initial return on day 1 for the full sample is 16 percent. Adjusting the initial return for market movements does not result in a different figure. From the data in table 2, it can be concluded that the PEO introductions are less under-priced than the non-PEO initial public offerings. Even though all three calculations of the return show less underpricing for the PEO initial public offerings, this difference is not significant. Therefore, contrary to the study done by Megginson and Weiss (1991) on the American market, the certification hypothesis of private equity funds for the Dutch stock market, must be rejected.

*** Insert Table 2 about here ***

The influence of different variables on the level of the initial return is investigated by means of linear regression. The following explanatory variables are included in the regression models: *PEO* is a dummy variable which takes the value 1 when an initial public offering was private equity backed and takes the value 0 when the initial public offering was not backed by private equity. Based on the theoretical model of Rock (1986) and the empirical research done by Carter *et al.* (1998) one can assume that the reputation of the lead manager influences the level of underpricing. Initial public offerings, which are accompanied by the most prestigious lead managers, cause the least ex-ante uncertainty for shareholders and show the lowest level of underpricing. To analyze the relation between lead manager and the amount of underpricing for the Dutch market, it is assumed that each initial public offering has just one lead manager. The (investment) banks, syndicate leader, global coordinator or bookrunner mentioned first in the issue prospectus is chosen to be the lead manager. The market share was chosen as a proxy for the reputation class. It is assumed that the bigger the market share the better the reputation. The ABN AMRO (Rothchild) Bank has by far the biggest market share. The *LM* variable corresponds with the lead manager. All introductions accompanied by ABN AMRO received value 1 and all the other introductions have value 0.

METH takes on value 0 when there was a fixed offering method and value 1 if a more flexible method was used. Prior research by Eijgehuijsen (1989) shows that IPOs which use the method of a fixed subscription-offering price show more underpricing compared than the (more flexible) claim-, tender-, and bookbuilding method. A possible explanation for this difference is that the offering price is determined at a very early stage when using fixed subscription offering price method. Therefore no adjustments can be made in a later stage when there is a lack of or a great demand. To make sure

that there will be sufficient demand, the offering price will more likely be too low than too high, *i.e.* more underpricing.

AGE refers to the age of the IPO. Table 3 presents the estimated parameters of the regression model and test results. It is assumed that older more established companies cause less ex-ante uncertainty for the shareholder and therefore show less underpricing.

*** Insert Table 3 about here ***

With the exception of the influence of the variable IPO method (*METH*) on raw initial return, the signals of the line of regression correspond with the predicted influences. However, of the four variables, only lead manager (*LM*) and age (*AGE*) are found to be of significant influence. The variable *METH* is not significant in this model. More or less the same holds for the regression (2) and (3) based on abnormal returns. The explanatory power (R^2) of the estimated functions is approximately 9%.

4.2. Underperformance

Figure 1 plots the average cumulative abnormal return for 36 months after introduction excluding the return of the first trading day.

*** Insert Figure 1 about here ***

The IPO portfolio achieved an average (not benchmark adjusted) cumulative total return (CR) of 36 percent after 36 months. After adjusting the CR, the aftermarket performance appears to be declining. Dividing the sample into PEO and non-PEO initial public offerings provides different results.

Figures 2 and 3 show the difference in performance. Based on the AMX index there is significant underperformance during eleven of the 36 months of the non-PEO initial public offerings compared to the PEO offerings.

*** Insert Figure 2 about here ***

*** Insert Figure 3 about here ***

Table 4 shows the wealth relative ratios of the non-PEO and PEO initial public offerings. Again a difference between the two sub-samples is found: the PEO initial public offerings outperformed the benchmark, while the non-PEO initial public offerings showed underperformance. The difference between the two sub-samples is statistically significant at a 10% level.

*** Insert Table 4 about here ***

Based on prior studies of the performance of initial public offerings a number of variables were tested with a regression analysis of the buy-and-hold return of the initial public offerings. The variables were derived from the certification hypothesis, the ‘fads’ theory and the ‘windows of opportunity’ theory. Besides this ‘traditional’ set of variables, a number of new variables were introduced: offering motive and average sales growth rate prior to the IPO.

4.2.1. Certification hypothesis

PEO: private equity backing. A dummy variable is used to measure the variable *PEO* where an IPO takes the value 1 when it refers to a PEO initial public offering and 0 when it refers to a non-PEO

initial public offering. The involvement and the facilitating role of private equity funds is expected to have a positive effect on the aftermarket performance of IPOs, (Brav and Gompers, 1997)

LM: reputation of the lead manager. A dummy variable is used to measure the variable *LM* where an IPO takes the value 1 if it was backed by ABN AMRO Bank and 0 if it was backed by another lead manager. The reputation of the lead manager is expected to have a positive effect on the aftermarket performance of IPOs. This corresponds with the certification hypothesis (Carter *et al*, 1998).

4.2.2. Fads theory

LNIPO: the natural logarithm of the IPO size (in 100 million Euro). The IPO size is the amount of shares of the initial public offering multiplied by the offering price. The ‘fads’ theory of Aggarwal and Rivoli (1990) assumes that the size of the IPO affects the aftermarket performance. Small IPOs are associated with young small companies and are therefore influenced more by hypes in the stock market. In general, younger and smaller companies have a larger up-side potential than larger more established companies. Large IPOs are linked with larger more established companies who are less sensitive to movements on the market or shareholder’s sentiments. Besides this, the volatility of the introduction shares declines as more shares are issued. The IPO size is therefore expected to have a negative effect on the aftermarket performance of IPOs.

LNTURN: the natural logarithm of the turnover size (in 100 million Euro) of the initial public offering. The variable *LNTURN* is also a measure of the risk profile of an initial public offering. The higher the turnover the lower the risk profiles of an IPO. The turnover size is expected to have a positive effect on the aftermarket performance of IPOs.

AGE: age of the initial public offering. The variable *AGE* is a measure of the risk profile of an initial public offering. *AGE* is therefore also a proxy for the ‘fads’ theory. Older companies have proven their capabilities and are less prone to market tendencies and shareholder sentiment. The age of the firm is expected to have a positive effect on the aftermarket performance of IPOs.

ICT: A dummy variable is used to measure the variable information and communication technology (*ICT*) industry, where an IPO takes the value 1 when it refers to a ICT initial public offering and 0 when it refers to a non-ICT initial public offering. This variable is included because ICT funds have been popular in the period of analysis. The variable *ICT* is expected to have a positive effect on the aftermarket performance of IPOs.

4.2.3. Windows of opportunity

BTOM: book-to-market ratio. The variable *BTOM* is the book-to-market value ratio of an IPO and is a possible indicator of a relative over-valuation of an IPO. The book value is based on the intrinsic value per share. The market value is the first closing price of the initial public offering. A low value of this ratio indicates an over-valuation of the initial public offering and the usage of ‘windows of opportunity’ as described by Loughran and Ritter (1995). If a company wants a maximization of its revenue from the initial public offering, then the company will go public at a time of relative over-valuation. If a company does not meet the (high) expectations over time a (sharp) fall in prices might be the result. The book-to-market ratio is therefore expected to have a positive effect on the aftermarket performance of IPOs.

4.2.4. Initial return

IR: initial return. The variable *IR* measure the return during the first offering day. It is presumed that initial public offerings with a high average initial return are very much wanted by investors and will show a better aftermarket performance. The initial return is therefore expected to have a positive effect on the aftermarket performance of IPOs.

METH : offering method. A dummy variable is used to measure the variable *METH* where an IPO takes the value 1 if a flexible offering method was used and 0 if a fixed offering price was used.

Based on the above mentioned analyses of the level of underpricing the following reasoning is used: initial public offerings via a fixed offering price have the highest initial return, initial public offerings with the highest initial return have the ‘best’ aftermarket performance. The offering method is therefore expected to have a negative effect on the aftermarket performance of IPOs.

4.2.5. Sales growth and offering motive

SGROW: sales growth: This variable measure the average sales growth rate over a period of two years before an IPO. Based on information gathered from the issue prospectuses the financial data with regards to the average sales growth period of two years before the company going public has been calculated. The assumption is that companies, which realize a substantial sales growth in the years prior to public offering, will continue to do so in the aftermarket. *SGROW* is considered as an indicator of the potential of the IPO firm to realize sales growth in the aftermarket. The average sales growth is therefore expected to have a positive effect on the aftermarket performance.

MOT: offering motive. The variable *MOT* is the ratio of the amount of issued shares to the total amount of shares of the initial public offering. If the ratio is 0 then the IPO is fully used for re-issuing and this indicates the cashing in of shares by ‘old’ shareholders. If the value of the ratio is 1 then the

IPO is only used to issue new shares and indicates the receiving of funds to finance further expansion of the company. Younger and growing (promising) companies who use an IPO for expansion will have most likely, more an up-side potential. The offering motive is therefore expected to have a positive effect on the aftermarket performance of IPOs.

*** Insert Table 5 about here ***

Table 5 shows that the explanatory power of the estimated regression (R^2) lies around 30 percent. The signs of the proxy variables *LM*, *AGE*, *ICT* and *MOT* on the aftermarket performance of the IPOs, do not correspond with expectations. Certification by means of private equity backing can not be confirmed. Noteworthy is that the expected sign of *ICT* does not correspond with the regression results. The effect of *ICT* variable significant at a level of 10 percent. Of the newly introduced variables the average sales growth (*SGROW*) had a positive effect on the aftermarket performance.

The variable IPO size (*LNIPO*) appeared to be strongly correlated with the variable turnover size (*LNTURN*) and is therefore not included in the estimated functions. The estimated functions have been checked for multi collinearity by means of the VIF-statistics. The correlation coefficient between the explanatory variables was small with a VIF-statistics of about 1.

5. Conclusion

The average initial return on day 1 for the full sample of 106 initial public offerings is 16 percent. The 38 private equity-backed IPOs show an average level of underpricing of 13 percent, the 68 non-private equity-backed IPOs 17 percent. Despite the fact that the PEO sample showed less

underpricing than the non-PEO sample and the certification hypotheses seems to be confirmed, the difference between the two is, however, not significant.

The certification hypothesis of the lead manager could be accepted. Initial public offerings that were accompanied by prestigious lead managers show less underpricing. In the Netherlands the ABN AMRO Bank, based on its market share, is regarded as the most prestigious lead manager. The 42 initial public offerings backed by ABN AMRO had an average level of underpricing of 9 percent, compared to an average of 24 percent for the six initial public offerings backed by the less prestigious lead manager, RABO Bank.

Initial public offerings via a fixed offering price show more underpricing than the flexible methods of offering. Flexible methods of offering enable the issuer to adjust the price according to the expectations of the shareholder and to decrease the 'discount' on the offering share *i.e.* the level of underpricing.

Older initial public offerings show lower levels of underpricing. Companies with a higher age are apparently raise more confident amongst the shareholders. The necessity for them to give a discount for ex-ante uncertainty is less relevant. On the other hand a lower initial return can also be explained as a result of negative perceptions of the shareholders about possible up-side potential of the IPO.

After three years, 75 IPOs have an average underperformance. If the sample is divided into two, it appears that the underperformance is caused by the non-PEO initial public offerings. The PEO initial public offerings perform better on a structural basis. This holds true for the three-year return calculations, based on the cumulative average abnormal return and the average wealth relative ratio excluding the initial returns, using several comparable benchmarks.

A possible explanation for the outperformance of private equity-backed IPOs compared to that of non-private equity-backed IPOs is the phenomenon of ‘double selection’. Double selection refers to the investment and exit opportunity used by private equity funds. Private equity funds will in general only invest in companies if there is enough potential to realize the return objectives. In other words, the company will have to meet the return objectives through the payment of dividends and/or with an increased share price at the time of exit.

Apart from this, a private equity fund will only take the most successful companies public. If a private equity fund frequently takes companies to the stock market, a certain perception will be created with the shareholders with regard to the quality of these initial public offerings. To make sure that there is enough interest (*i.e.* demand with the shareholders), a private equity fund will only want to be identified with successful initial public offerings. Thus the phenomenon of double selection increases the chances of PEO initial public offerings to do better in the aftermarket than initial public offerings that were not backed in this way.

With the above mentioned research results, contrary to the research by Munsters and Tourani Rad (1994) and in agreement with research by Brav and Gompers (1997) in America, it is shown that in the Netherlands private equity backing has a positive link with the aftermarket performance of initial public offerings.

To determine the effect of the variables on the aftermarket performance a regression analysis was performed. This analysis shows that ‘traditional’ variables from previous research provide no long-term explanations of the aftermarket performance of IPOs. The ‘new’ variables: private equity

backing, average sales growth and the ICT industry show significant correlation with the aftermarket performance.

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Table 1
Description of the sample firms

Table 1 shows the descriptive details of the sample of 106 IPOs in the period 1985-1998 on the Amsterdam Stock Exchange. Non-PEO refers to initial public offerings, which had no private equity backing. PEO IPOs are those with private equity backing. The IPO methods are categorized into whether an introduction had a fixed offering price or was brought to the market through a flexible method. The flexible method includes claim, tender, and bookbuilding. Market value is the total amount of fully paid for shares from the introduction multiplied by the first closing price. The offering value is the total amount of issued and reinvested shares multiplied by the offering price. Book to market signifies the ratio between the intrinsic value of the private equity and the market value of the private equity on the basis of the first closing price. The *t*-value is the statistics for the difference between the non-PEO and PEO initial public offerings in the sample.

Characteristic	Total	Non-PEO	PEO	T-value
<i>N</i>	106	68	38	
<i>IPO method</i>				
Fixed	68	40	28	
Flexible	38	28	10	
<i>Lead manager</i>				
ABN AMRO Bank	42	27	15	
MeesPierson	23	13	10	
ING Bank	6	5	1	
RABO Bank	6	3	3	
Kempen & Co.	5	5	0	
<i>Average Age</i>	45	47	41	0.746
<i>Average Market value (Euro)</i>	305,812,073	415,267,074	109,945,228	1.889 ^a
<i>Average offering value (Euro)</i>	90,001,046	115,078,494	45,125,614	1.386
<i>Book-to-market ratio</i>	0.38	0.42	0.33	1.253

^a Significant at a 10% level

Table 2
Initial and abnormal returns

Table 2 shows the initial and abnormal returns for the sample of 106 IPOs in the period 1985-1998 on the Amsterdam Stock Exchange. The average initial return (IR) is the uncorrected return during the first day of trading. The abnormal return 1 (AR1) is the initial return corrected for the return on the CBS market index. The abnormal return 2 (AR2) is the initial return corrected for the return on the AMX market index. A t-test was done with the null hypothesis that the average of IR, AR1 and AR2 is zero. The results of this test are shown with the averages. A t-test was also done with the null hypothesis that the averages of IR, AR1 and AR2 are the same for PEO and non-PEO initial public offerings. The t-value is displayed in the fifth column.

Short-run return	Total	non-PEO	PEO	T-value
<i>N</i>	106	68	38	
<i>initial Return (IR)</i>	0.16	0.17	0.13	0.921 ^a
<i>Abnormal Return 1 (AR1)</i>	0.16	0.17	0.13	0.938 ^a
<i>Abnormal Return 2 (AR2)</i>	0.16	0.18	0.13	0.946 ^a

^a Significant on a 10% level.

Table 3
Regression analyses of the short-run return

Table 3 shows the regression result of the short-run return of the sample of 106 IPOs in the period 1985-1998 on the Amsterdam Stock Exchange. *METH* corresponds to the method of offering used, *LM* with the lead manager, and *AGE* with the age of the IPO. Regression 1 shows the regression results of initial returns, regression 2 of the abnormal return corrected for the return on the CBS market index, and regression 3 of the abnormal return corrected for the return of the AMX market index.

Proxies	Expected sign	Regression 1 (IR)	Regression 2 (AR1)	Regression 3 (AR2)
<i>(intercept)</i>		0.269 ^a	0.271 ^a	0.270 ^a
<i>PEO</i>	-	-0.053	-0.055	-0.055
<i>METH</i>	-	0.0001	-0.0004	-0.0026
<i>LM</i>	-	-0.106 ^b	-0.105 ^b	-0.109 ^b
<i>AGE</i>	-	-0.001 ^b	-0.001 ^b	0.001 ^b
R ²		8.7%	8.6%	8.7%
F		2.391 ^c	2.390 ^c	2.398 ^c
N		106	106	106

^a Significantly different from zero at a 1% level based on a t-test (one-tailed)

^b Significantly different from zero at a 5 % level based on a t-test (one-tailed)

^c Significantly different from zero at a 10 % level based on a t-test (one-tailed)

Table 4

Wealth relative ratio of PEO and non-PEO initial public offerings excluding initial return

WR1 gives the wealth relative ratio with the CBS all shares index as the benchmark, WR2 gives the wealth relative ratio with the total return buy-and-hold CBS minus Royal Dutch Petroleum (Shell) index as the benchmark and WR3 gives the wealth relative ratio with the AMX index as the benchmark. Return is defined as index and dividend return.

	N	WR1	WR2	WR3
Non-PEO	47	0.93	0.97	0.95
PEO	28	1.28	1.35	1.32
T-value		1.600 ^a	1.620 ^a	1.643 ^a

^b Significant at the 10% level.

Table 5
Regression analyses and long-run return

Regressions 1, 2 and 3 are related to the three-year return on shares (including dividend yield; see equation 5). To correct the buy-and-hold total returns for market movement the CBS all shares index (CBS), the CBS total return buy-and-hold CBS without Shell index (CBS excl. Shell) and the AMX total return buy-and-hold index (AMX) were chosen as benchmarks (analogous to equation 5).

Proxies	Expected sign	Regression 1	Regression 2	Regression 3
<i>(intercept)</i>		-0,596	-0,494	-0,362
<i>CBS</i>	+	1,387 ^a		
<i>CBS excl. Shell</i>	+		1,260 ^a	
<i>AMX</i>	+			0,866 ^a
<i>PEO</i>	+	0,656 ^c	0,638 ^c	0,635 ^c
<i>LM</i>	+	-0,412	-0,419	-0,379
<i>IR</i>	+	0,280	0,355	0,413
<i>METH</i>	-	0,003	0,019	0,019
<i>MOT</i>	+	-0,118	-0,092	-0,092
<i>SGROW</i>	+	0,958 ^c	1,059	1,156 ^c
<i>BTOM</i>	+	0,426	0,473	0,399
<i>AGE</i>	+	-0,003	-0,003	-0,003
<i>LNTURN</i>	+	0,087	0,068	0,083
<i>ICT</i>	+	0,936 ^c	0,904	0,892
R ²		29,3%	30,2%	30,1%
F-value		2,374 ^b	2,475 ^b	2,461 ^b
N		75	75	75

^a Significantly different from zero at a 1% level based on a t-test (one-tailed)

^b Significantly different from zero at a 5 % level based on a t-test (one-tailed)

^c Significantly different from zero at a 10 % level based on a t-test (one-tailed)

Figure 1

Figure 1 shows the aftermarket performance of 75 IPO in the 36 months after the initial offering date. The returns do not include the initial return. CR represents the cumulative average raw return. CAR1 uses the market weighed CBS index as a benchmark to determine the aftermarket return. CAR2 is calculated as CAR1 with the exclusion of Royal Dutch Petroleum from the CBS index. CAR3 uses the market weighed AMX index as a benchmark to calculate the aftermarket return.

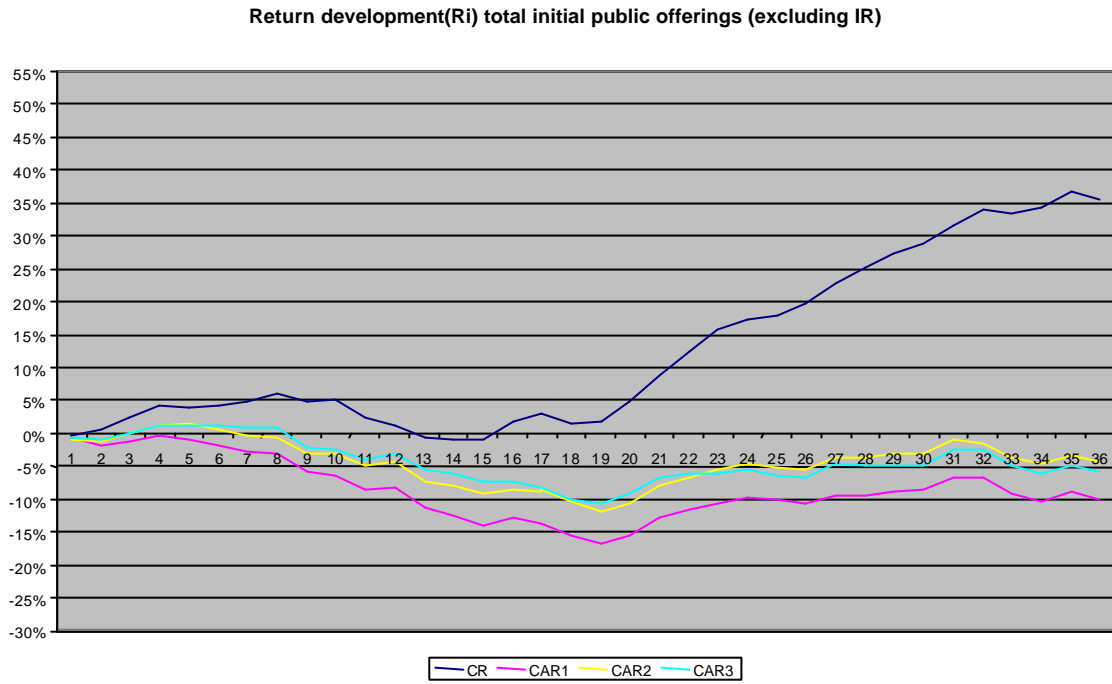


Figure 2

Figure 2 presents the aftermarket performance (excluding the initial return) of 68 IPOs not backed by private equity for 36 months after the IPO date.

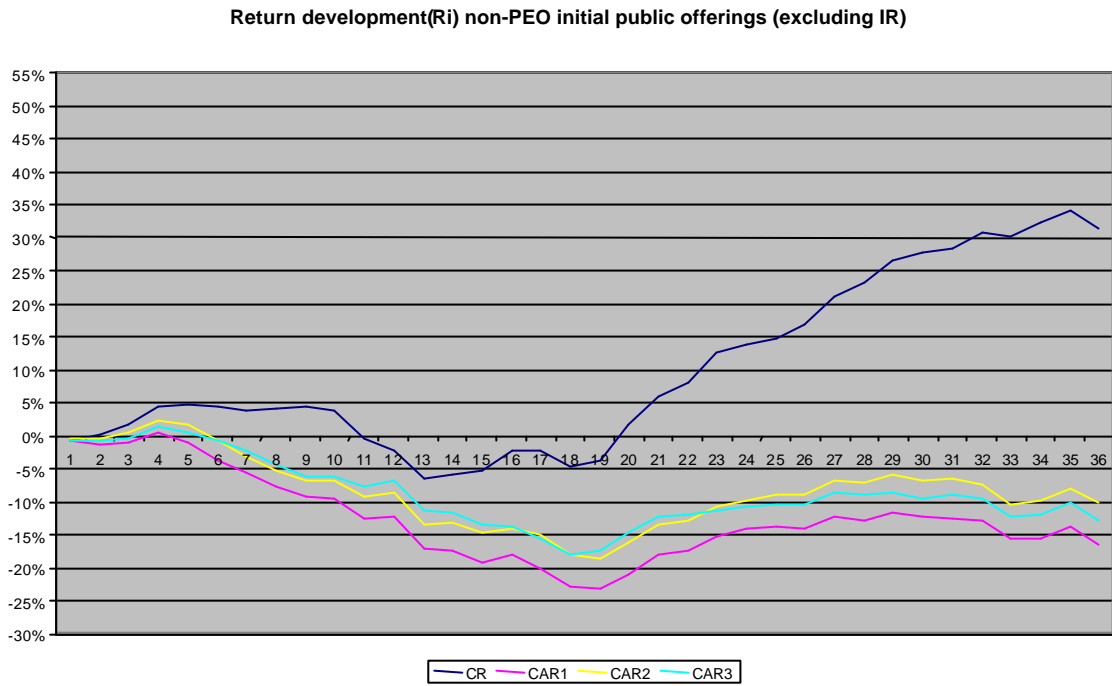


Figure 3

Figure 3 shows the aftermarket performance (excluding the initial return) of 38 IPOs backed by private equity for 36 months after the IPO date.

