Private Equity – Blessing or Curse?
The Case of IPOs

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August 2010

Abstract

This paper compares the profitability of companies with and without Private Equity investment at and surrounding the time of these companies' IPOs. Using a uniquely hand-collected and expansive dataset of IPOs in Germany over the period 2000 to 2007, we analyze the IPO companies' balance sheet performance as represented by returns and cash flows and the companies' stock performance immediately following the IPO. Next to comparing PE and non-PE-backed companies, we further differentiate between buyout and venture deals and determine to which degree the proficiency of the Private Equity firms and the stakes they hold in their IPO'd portfolio companies influence the observed performance measures. In addition to comparing the companies at the time of the IPO, we furthermore observe the groups' performances over time, specifically over the period from two years before to two years after the IPO. We thereby expand the existing literature by three major factors: (1) covering the New Economy Bubble and its aftermath, (2) delivering reliable results by using sophisticated statistical methods to overcome the self-selection bias mainly overlooked in prior studies comparing PE and non-PE-backed companies and (3) observing a large variety of factors to distinguish between many different kinds of PE investments. Our results show that PE-backed IPO firms, especially firms with Venture Capital investments, tend to be less profitable than non-PE-backed IPO companies. We further show that the IPO companies' profitability further declines if the PE firms hold larger stakes in the companies and if the PE firms are more well-known and proficient. However, in spite of this inferior performance at the time of the IPO, PE-backed companies tend to increase the overall profitability over the five year period surrounding the IPO stronger than non-PE-backed companies.

JEL Classification: G11, G32, G34,

Key Words: Private Equity, IPO, Venture, Buyout, Investment Profitability

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1 Introduction

Private Equity (PE) firms exert a tremendous amount of influence on their portfolio companies. They perform a wide range of activities such as strategic guidance, financing expertise or the restructuring of the companies' operating business. In doing so, they aim at creating profits for their investors by increasing the value of the portfolio companies. This value creation can only be realized at the "exit", i.e. the event at which the Private Equity firm sells off its stake in the respective portfolio company. One of the most profitable and consequently desired exits is taking the portfolio firm public through an Initial Public Offering (IPO). Selling the shares of an IPO company into the primary stock market usually results in large profits for the initial shareholders as IPO shares can be sold into the market at a premium over their pre-IPO value. A general rule of thumb thereby suggests that the more profitable the IPO company and the more promising the company's financial present and future according to its equity story, the higher is the price at which the shares can be sold into the market. For Private Equity investors an IPO's purpose is therefore to raise as much equity capital and thereby generate high returns on their investments. Thus, the ultimate goal must be to get the IPO company into the most profitable shape possible for its going public.

However, although the interests of the Private Equity investors and the IPO companies' management seem to be aligned – increasing profitability and generating equity – the Private Equity investor might have additional goals, which can be detrimental to achieving highest possible profitability and generating equity capital. For one, Private Equity investors usually strive to exit their investments at around five years after making the investment. This "deadline" must often be met to generate payouts for the PE funds' investors, disregarding possible future value increases in the portfolio companies. Second, a PE firm can benefit from stripping a potential IPO company off certain assets before the IPO to generate pre-IPO returns for its investors, e.g. through extraordinary dividend payments. Disclosure requirements and shareholder or analyst pressure of a public company only allow for these kinds of transactions to be made before the IPO. A PE-backed IPO company might hence be deprived of a best possible performance at the time of the IPO due to these transactions. And third, Private Equity investors are often accused of only being interested in short-term value boosts at the expense of economically healthy long-term value growth. Following this idea, PE investors might take their portfolio companies public prematurely, based only on short-term artificial growth, e.g. through the sale of valuable assets or one-off balance sheet transactions. These three allegations against PE investors stand in contrast to the initial

remark – and empirical fact – that PE firms do create value for their portfolio companies and consequently also for the companies' other investors. Based on these arguments, the goal of this paper is to compare the financial performance of IPO companies with and without Private Equity investors at the time of the IPO. We analyze a total of 247 IPOs in Germany over the period 2000 to 2007, of which 110 have a PE-backing at the time of the going-public. Observing four balance sheet performance indicators (Return on Assets, Return on Sales, Cash Flow on Assets, Cash Flow on Sales) and two stock performance indicators (Stock Volatility and Abnormal Return), we try and determine to which degree PE-backed firms differ in their performance at the time of the IPO, two years before the IPO and in the five year period surrounding the IPO, as compared to companies without PE-backing.

Although there is a large body of literature on this subject, we believe we can strongly contribute to the findings or these prior papers. First, we combine several different analyses in one paper which have been tackled in separate papers in the past, leading to ambiguous results. By testing different analyses with the same dataset over the same period of time, we hope to deliver thorough and reliable results. Second, most of the prior studies comparing PE- and non-PE backed companies neglect the selection-bias issue that arises in this topic. This bias describes the fact that PE firms choose only a certain kind of portfolio company, e.g. in terms of profitability or operating business. Possible differences between PE- and non-PE-backed companies might thus be caused by the PE firms' choice for portfolio companies, not by their management influence following the investment. By using sophisticated statistical methods, we try to overcome this problem in order to deliver unbiased results. Third, there is to the best of our awareness only one paper (Wang, Wang and Lu, 2003) which includes the New Economy Bubble in this kind of analysis. However, it is crucial to look at this period, in which more than 50 percent of all IPO deals had a PE- (mostly venture capital-) backing. Our paper does that by including the year 2000 in the analysis and comparing it to the following seven years.

Our paper includes one main test and four additional analyses and robustness checks. In the main test, we use a propensity matching analysis as well as a multivariate OLS regression model to compare the two groups (PE- and non-PE-backed IPOs) at the time of the IPO and two years before. We thereby especially account for the stake the PE firm has in each respective IPO company and the PE managements' proficiency exemplified by a ranking of all observed PE firms in our sample. In the additional tests, we (1) look at the stock performance of the two groups' stocks immediately following the IPO, (2) include the

corporate governance of the IPO companies as this can also have a strong influence on financial and stock performance, (3) distinguish the PE-backed deals by buyout and venture deals and (4) analyze the financial performance of the two groups in the five year period surrounding the IPO date by testing a dynamic panel regression model. Our results show that PE-backed companies tend to be less profitable at the time of the IPO. However, in contrast to non PE-backed companies, Private Equity investors manage to improve the financial performance of their targets over time, while the performance of non-PE backed companies tends to have a negative trend.

The paper is structured as follows: we proceed by discussing the relevant theoretical background to provide the reader with necessary information on PE behavior and prior subject-related studies. In the third part we introduce the methodology of the main analysis' two parts, the propensity score matching and the multivariate OLS regression model. The fourth part contains and discusses the results of the main analysis. In the four sections of the fifth part we introduce the methodology and results of our additional analyses. The sixth part concludes the paper by summarizing and interpreting the results.

2 Theoretical Background

This leads us to one of the main preliminary considerations: What is the role of Private Equity companies and in which way to they try to create added value? Therefore, we consider the two main functions of Private Equity companies as financial intermediaries discussed in the related literature.

The first hypothesis is the one of certification stating that Private Equity investors mitigate the asymmetry of information between the owners of the company and external investors and thus reduce potential frictions in the IPO market. They gain a better insight into the portfolio company than most auditors due to their equity stake and the exercise of their influence via the participation in the supervisory board, a monitoring instrument which most of the Private Equity investors have access to. Having acquired internal information, Private Equity investors have two major incentives to signal the high quality of their portfolio companies. First, they are incentivized to only invest in potentially successful companies, since they do invest their own money. Private Equity companies usually receive a fixed management fee plus a profit sharing. Thus, the more lucrative their funds are, the higher the earnings of the investment company. Second, exiting Private Equity investments via the IPO channel has

shown to be the most profitable. Keeping in mind the informational asymmetries, a high reputation of the Private Equity company reduces the issuing yield and hence increases the investment company's earnings. Betraying the external investor's trust by issuing a low performing target may lead to higher issuing yields and, as a consequence, to decreasing earnings in the future implying a lower fund performance. Megginson/Weiss (1991) hypothesize certification based on a sample of 320 Venture Capital backed and 320 non-Private Equity backed companies of the same industry and a similar size, which were publicly listed in the US between 1983 and 1987. They show, that Venture Capital backed companies have an issuing yield of 7.1% which is significantly lower than the issuing yield of 11.9% of non-Private Equity backed companies. Furthermore, Venture Capital backed companies are significantly younger (8.6 years) at the time of the IPO than their non Private Equity backed counterparts (12.2 years). The authors thus conclude that Private Equity companies enable their targets to accomplish an IPO earlier and with reduced costs by means of their reputation.

The second hypothesis deals with the Private Equity company's function of monitoring their target. As stated above the internal investors directly participate in the target company's profit. Thus, the Private Equity stake holders provide management know-how as well as support their target in managing its operational business in order to trying to achieve a positive performance. By this means, Moral Hazard problems caused by an opportunistic management can be reduced. Conventional instruments for implementing monitoring are among others staged financing, participation in the supervisory board, and certain types of contracts. Staged financing allows the Private Equity corporations to evaluate their investments on a regular basis and to write them off if necessary. Regarding seats in the supervisory board, Barry et al. (1990) show that Private Equity investors have a median share of one third of the supervisory board at the time of the IPO, which allows them to directly monitor the management's actions. Kaplan/Strömberg (2001) point out, that by certain types of contracts Cash-Flow-, voting, and liquidation rights are allocated depending on the target's performance among the company owners and the Private Equity investors. By this means, mechanism are implemented which incentivize the management to perform as well as possible in order to prohibit a liquidation of their company by the Private Equity investor, which would lead to a loss of the manager's wealth as well as of his reputation.

While both, the certification and the monitoring hypothesis, imply a better performance of Private Equity backed companies, the grandstanding theory developed in 1996 by Gompers would explain a worse performance of PE backed companies at the time of the IPO away.

This hypothesis amounts that especially young Private Equity firms take their target companies public at a premature state in order to signal their skills to the capital market. Although this early stage going public leads to a loss in profit related to this specific IPO, it tends to have a positive impact of future actions, i.e. especially access to funds by external investors due to a longer performance history, which is de facto the sole criterion investors base their decision of investing on.

Empirical studies regarding the question, of whether or not Private Equity investors create added value are sparse to find. While there are several papers comparing the performance of initially publicly offered companies – regardless of being PE backed or not – to those of the peers in their related sector[5], only a few studies analyze the difference of pre- and post-IPO performance of PE-backed companies versus their non PE-backed counterparts. Jain/Kini (1995) examine the impact of Venture Capital financing based on a data set of 136 VC-backed and 136 non-VC-backed companies in the US which were taken public between 1977 and 1988. They find, that VC-backed companies have a significantly lower RoA and CFoA in the year prior to the IPO than non-VC backed companies. Jain and Kini stress that this reflects the fact, that Venture Capital are able to offer their targets to the capital markets at an earlier stage due to their certification function.

Wang/Wang/Lu (2003) come tendentially to the same result as Jain/Kini analyzing their data set of 82 VC-backed and 82 non-VC-backed companies which went public between 1987 and 2001 in Singapore, but the differences are in their case statistically insignificant.

Degeorge/Zeckhauser (1993) analyze a data set covering 62 IPOs in the US between 1983 and 1987. Using a matched sample approach, they find that PE-backed companies have a better development in terms of their RoA the year prior to the IPO and a worse the year after the IPO compared to non PE-backed companies.

These few studies clarify the necessity of a thorough analysis to shed light on this crucial question, of whether and how Private Equity companies create value. We therefore base our analysis on sophisticated and appropriate statistical methods in order to overcome potential biases and conduct various robustness checks, which our data set enables us to perform. This unique and extensive data set is presented in the following paragraph.

[5] See Kaplan (1989), Smith (1990), Jain/Kini (1994), Holthausen/Larcker (1996), Murray/Niu/Harris (2006) Mikkelson/Partch/Shah (1997), Cai/Wie (1997), Kim/Kitsabunnarat/Nofsinger (2004), Khurshed/Paleari/Vismara (2005),

3 Data and Methodology

3.1 Data

There exists, to the best of our knowledge, no thorough IPO dataset worldwide comprising the necessary information for the analyses set forth in this paper. We therefore use a unique hand-collected dataset of 247 IPOs in Germany over the period 2000 to 2007. For each IPO therein we collect a large number of different variables, such as information on the IPO itself, the IPO company, its shareholders before the IPO, its corporate governance structure as well as all financials from two years before to two years after the IPO. A list of the variables used for the analyses in the paper can be found in Table 2 of the Appendix. The information on the IPO as well as the company structure prior to the going public was taken from the companies' IPO prospectuses. This prospectus is a legal document which has to be filed mandatorily under German securities regulation.[6] The data and information given therein are therefore most reliable as companies can be held liable for false information provided in the prospectus. The financial information after the IPO was taken from the Thomson Datastream database. The dataset ends in the year 2007 because the used panel dataset needed two years of information following the IPO to be balanced. In 2008 no IPOs took place in Germany. We begin the dataset in 2000 to catch the effects of the dotcom-bubble in Germany, in which a lot of deals saw a Private Equity or Venture Capital involvement. The dataset is comprised of 110 IPOs with and 137 deals without Private Equity involvement.

3.2 Methodology

The goal of our analysis is to answer the question: do PE-backed companies have a better financial performance than non-PE-backed companies at the time of an IPO? To answer the question, we first have to define how we measure financial performance. We use a total of six proxy variables to represent performance, of which four are balance sheet-based and two stock-based. The balance sheet variables we use are Return on Assets (RoA), Return on Sales (RoS), Cash Flow on Assets (CFoA) and Cash Flow on Sales (CFoS). The stock indicators are Stock Volatility and Abnormal Return. The choice for using this set of proxy variables is based on a number of reasons. First, the balance sheet indicators are well suited for showing the profitability of a company. RoA and RoS show how profitable a company operates each dollar (or Euro) of assets (RoA) and revenues (RoS). By standardizing the absolute amount of

[6] WpHG/WpPG kurz erklären

net income with the assets and revenues, RoA and RoS are comparable across different companies. Another advantage of using both asset and revenue profitability is that we can capture profitability effects of companies with large asset volume and companies with only little asset volume but potentially strong revenues. This is especially important in the case of venture-financed companies which tend to be younger startup companies without a large balance sheet but a possibly strong customer base resulting in high revenues. Both figures are thus well suited to proxy for the strength and efficiency of different companies relative to their business models. We further use the cash flow variables relative to assets and sales to measure the pure cash the companies generate from their business. It is important to analyze the cash generating power of a company: companies can generate a positive P&L-income, yet might run into trouble if they cannot generate any cash to "pay the bills". Analyzing cash is especially important in companies with Private Equity investment. The business model of Private Equity firms involves deal financing with large amounts of debt. To pay off the debt and thereby to increase the value of the used equity, Private Equity firms either invest in companies with strong cash flows or restructure companies in order to generate large cash flows. These cash flows are then used to cover the interest payments on debt and to pay off the debt. It is thus crucial to take cash flows into account when comparing PE-backed companies with PE-backed companies. All ratios are calculated as follows:

$$(1)\ RoA = \frac{Net\ Income}{Total\ Assets}$$

$$(2)\ RoS = \frac{Net\ Income}{Total\ Revenues}$$

$$(3)\ CFoA = \frac{(Net\ Income + Depreciations - Investments)}{Total\ Assets}$$

$$(4)\ CFoS = \frac{(Net\ Income + Depreciations - Investments)}{Total\ Revenues}$$

Our analysis consists of a simple and clear-cut four-step procedure. In a first step we analyze the difference between PE-backed and non-PE-backed IPOs descriptively, as displayed in Table 3 of the Appendix. This comparison is very preliminary, however it allows us to detect whether or not there are any differences between the two IPO groups at all. To detect these differences, we measure the four main proxies for financial performance – Return on Assets (RoA), Return on Sales (RoS), Cash Flow on Assets (CFoA) and Cash Flow on Sales (CFoS) – over the five-year period surrounding the IPO date. We display both mean and median

values as well as the absolute and relative changes in these numbers over the period for PE- and non-PE-backed IPOs. We further show the differences in Venture and Buyout deals by performing the same analysis for these two groups of IPOs. To detect the differences we use simple difference-in-means tests (t-Tests) to determine whether or not the observed differences between the groups are statistically significant or merely random.

The second step of our analysis consists of two analyses: a difference-in-means test using a propensity score matching technique and a multivariate OLS regression model. When comparing companies with and without Private Equity investors, the major obstacle in yielding valid and unbiased results lies in the self-selection bias of having a PE investment. As has been shown in the literature[7], Private Equity firms tend to target potential portfolio companies with very specific characteristics. Finding differences in the performance of the two groups at the time of the IPO might thus be rooted in the fact that these differences already existed at the time the PE firm made the investment. To overcome this endogeneity issue we perform a propensity score matching methodology of PE to non-PE-backed IPO companies in order to determine these differences. The underlying notion of this methodology is that the investment decision of a Private Equity firm can be captured by certain variables. These variables then allow for a matching of PE and non-PE backed companies with the same characteristics before the IPO and to subsequently compare the companies two years later, at the time of the IPO. The first analysis therefore consists of a propensity score matching, as displayed in the Tables 5 and 6 of the Appendix. To do so, we determine two groups of companies: companies with a PE investment and companies without. We use this 0/1-dummy variable as the dependent variable in a probit model determining the probability of having a PE investment. Our model takes the following form:

$$(5)\ PE_{Dummy} = \alpha + \beta_1 A_i + \beta_2 B_i + \beta_3 C_i + \varepsilon_i$$

In this model, β_1 is a set of variables indicating the financial performance two years before the IPO. In this case, the variables are RoA, RoS, CFoA and CFoS. β_2 is a set of additional company specific financials and/or numbers two years before the IPO. Included are the number of employees, company age, the number of shareholders before the IPO, whether or not the Board has an audit committee, the number of outside Board members, the number of other institutional investors before the IPO excluding PE firms and whether or not the directors possess shares of the company or have a stock option program. Finally, β_3 is a set of further company financials to capture the full performance of the company. Included are the

[7] See Berger/Udell (1998)

total revenues, depreciations, operating income, total assets, interest expenses on debt, capital expenditures and the operating cash flow. A detailed description of all variables can be found in Table 2 of the Appendix. The results of the probit model as provided in Table 5 show which variables determine the probability of having a PE investment two years before the IPO. We chose two years before the IPO as our matching point for one crucial reason: two years before the IPO, a Private Equity firm will not have "prepared" a portfolio company for its IPO. The companies with and without Private Equity investments should hence still be similar at this point in time, a matching can therefore expected to be unbiased.

Once the propensity scores are calculated for each IPO company, the matching of the two groups (Treatment Group $T_i = 1$ and Control Group $T_i = 0$) is performed. We match the companies using the following form:

$$(6)\ P(x_i) = Prob(T_i = 1|x_i), with\ (0 < P(x_i) < 1)$$

$P(x_i)$ or a linear function of it are subsequently used to find the matches. We perform the matching using the nearest-neighbor-matching methodology, in which one or several members of the control group are matched with one member of the treatment group with the closest propensity score. We perform two nearest-neighbor matchings using the five and ten closest neighbors to support the robustness of our results. Once the matching is performed, the differences between the groups can be observed, again using a difference-in-means approach between the matched pairs. In our case, we observe the differences in the four main performance proxies, RoA, RoS, CFoA and CFoS. These differences between the groups are calculated for each nearest neighbor group (five and ten nearest neighbors, respectively) at two different points in time. First, we measure the differences two years before the IPO to determine whether or not the matched companies are actually similar. Second, the comparison is made at the time of the IPO. The latter analysis is crucial for answer our research question: it will yield the results which show whether or not there are differences between PE and non-PE backed companies at the time of the IPO.

In addition to using the propensity score matching technique to determine differences between the groups we furthermore use a multivariate OLS regression model with robust standard errors. This model serves two purposes. First, we will be able to confirm the results of the propensity score matching analysis, adding further weight to our findings. Second, we are able to shed more light on the actual determinants of possible differences between the groups. Next to the sheer existence of a Private Equity investment itself it is interesting to see which

other factors might have an influence on the differences between PE and non-PE companies. To detect these influence factors we test three specifications of the same OLS model with each of our four main performance proxies RoA, RoS, CFoA and CFoS as dependent variables. The model takes the form:

$$(7)\ Y_i = \alpha + \beta_1 A_i + \beta_2 B_i + \beta_3 C_i + \varepsilon_i$$

Y_i takes the form of the four main performance proxies RoA, RoS, CFoA and CFoS at the time of the IPO for each company. β_i is the set of our main independent variables. We include the PE-dummy variable as our main explanatory variable to determine whether or not Private Equity has an influence on the differences between the groups. In a second specification of the model we additionally include the ownership stake the Private Equity firm has in the respective IPO company as well as the ranking of the PE firm. The ownership stake will serve as a proxy for the amount of influence the PE firm has on the IPO company. Should a PE firm be responsible for a significant difference in the performance measures, we would expect a larger ownership stake also to result in higher differences between the groups as the PE firm has stronger influence on the management decisions of the IPO company. We include the actual ownership percentage as a variable in the regression. The PE-ranking variable is a proxy of the proficiency and experience of the PE firm. As presented in Table 14 of the Appendix, we calculated a ranking of all Private Equity firms included in our dataset. The firms are ranked according to the numbers of IPOs they take part in our dataset, their age and the average ownership stake they had in each deal. This proxy will show whether or not a more experienced or skillful PE firm (i.e. with a higher ranking) has better performing portfolio companies than others. We include the actual ranking position as a variable in the performance. If there are multiple PE firms in the IPO, we include the average ranking position of all involved firms. In a third specification of the model, we additionally include two further dummies which serve as proxies for the experience and/or proficiency of the involved PE firm. The first dummy "Tech Venture" is 1 for all deals in which the IPO company was active in the IT/Technology sector and the PE firm was a venture investment and 0 for all other PE deals. It can be strongly conjectured that Venture Capital firms will be more skilled in the investments in small and technology-driven companies since this is their "core" business. They should thus be able to stronger increase operating performances than other PE firms in different sectors. The second dummy we add is the "Bubble Venture" dummy. We thereby account both for deals having taken place during the year 2000 in the dotcom-bubble. During this period, many IPO companies were taken public prematurely,

often simply based on future expectations than on actual historical performance results. These deals should thus be responsible for rather negative operating performance. We account for this specific effect by including this dummy variable.

We test each specification of the model using a large variety of control variables. The specifications of the models can be seen in Tables 7 and 8 of the Appendix, a description of the variables is given in Table 2.

4 Results

In the first step of the main analysis, we perform a difference in mean tests for the whole sample as shown in Table 3. Regarding the impact of a Private Equity backing, we find two crucial facts: First, the performance of PE-backed companies is worse than that of non PE backed companies at the time of the IPO. Therewith, we give further evidence to the certification hypothesis stating that Private Equity investors are able to take their targets public at an earlier stage due to signaling to the capital market the high quality of the issued company certified by the PE company's reputation. Furthermore, this finding also supports the window dressing theory hypothesizing that non-PE backed companies rather use their financial scope in order to make their balance appear more appealing to external investors, whereas Private Equity investors make their target report as objective as possible to prevent a loss in their reputation by certifying erroneously a high quality of an actually low performing company. Second, we find that Private Equity investors manage to improve the performance of their targets. Moreover, the development of their non-PE backed counterparts is not just smaller, but also negative which severely underlines the magnitude of this finding.

However, this discrepancy may be due to structural differences between the groups of PE- and non-PE-backed companies caused by Private Equity investors which just choose a certain type of companies as their targets and not due to management skills contributed by the PE company. Therefore, we use Propensity Score Matching (PSM) to overcome a potential selection bias. While Table 5 shows the probit model on which the PSM is based, Table 6 presents the results derived with this method: It can be inferred that the results basically remain unchanged compared to the results yielded with the difference in means approach, which further gives rise to the supposition, that Private Equity investors actively create added value.

The main analysis thus shows that there are substantial differences between PE- and non-PE backed companies in terms of their financial performance. Furthermore, we have ruled out a potential selection bias as a source for this difference. We now check, whether this statistically significant variation may be induced by corporate governance structures, the dotcom bubble and its aftermath, if they can be attributed to either Venture Capital or Buyout investment or if they are really caused by a Private Equity investment itself.

5 Additional Analyses and Robustness Tests

5.1 Initial stock performance of PE- and non-PE-backed IPOs

Next to the main analysis we perform a number of additional tests both to validate the main results and to add further insight into the differences between PE and non-PE-backed IPOs. First, we analyze the two groups' short-term stock performance following the IPO. The main analysis focuses on balance sheet performance; however it will also be interesting to determine whether or not Private Equity investors also have a signaling effect on the stock market. The question is here whether or not PE-backed IPOs have a superior stock performance in the first days after the IPO than non-PE backed stocks. The underlying notion of the question is based on the same theoretical ideas than the main analysis: Private Equity firms may contribute management skills or choose better performing companies, which should lead to a better performance, and they may reduce uncertainty of the capital market investors which should reduce volatility.

To find an answer to this question we analyze the short-term stock performance in terms of abnormal and period returns as well as the stocks' volatility within the first five and 20 trading days after the IPO, respectively. We calculate the abnormal return by:

$$(8)\ AR_{i,t} = R_{i,t} - [R_{f,t} + (R_{m,t} - R_{f,t})\beta_{i,t}]$$

with $R_{i,t}$ being the return on stock i at day t, $R_{m,t}$ being the return of the market portfolio at day t and $R_{f,t}$ being the risk-free rate. As we cannot calculate a Beta for the stock based on historic variances/covariances, a Beta of 1 is usually assumed for IPO stocks.[8] For the market return we use the German DAX stock index as a proxy. The return of the market portfolio at time t is thus given by the return of the DAX at that day. The return of stock i is given by

[8] See Boergmann (2001)

$$(9)\ R_{i,t} = (P_{i,t} - P_{i,t-1})/P_{i,t-1}$$

with $P_{i,t}$ being the price of the stock at time t and $P_{i,t-1}$ being the stock price at time t-1. We finally calculate the cumulative abnormal return by

$$(10)\ CAR_{i,T} = \left\{\prod_{t=1}^{T}(1 + AR_{i,T})\right\} - 1$$

The second performance proxy, the period return, is given by

$$(11)\ PR_{i,T} = (P_{i,T} - P_{i,1})/P_{i,1}$$

with $P_{i,1}$ being the end-of-day stock price of stock i at the first trading day. For our calculation, we use the fifth and twentieth day, respectively. We define the volatility as the standard deviation of the stock returns over the first five and twenty trading days. We observe the calculated three measures - abnormal return, period return and volatility – in the same way we treat the main balance sheet proxies. In a first step, we measure the difference between the PE and non-PE groups descriptively, as shown in Table 4 of the Appendix. We report the figures for the whole sample as well as divided by PE and non-PE group as well as buyout and venture deals. In a second step, we use the five day abnormal return and the twenty day stock volatility as dependent variables for the multivariate OLS regression model we already use for our main analysis. The results are displayed in Table 11 and Table 12 of the Appendix. Theses tables show that a Private Equity involvement as well as all Private Equity specific control variables do not have an impact on returns and volatility. It can be concluded that these results support the efficient market theory, since the market participants correctly and immediately anticipate structural differences and adopt their trading.

5.2 Performance and Corporate Governance

The second additional analysis we perform is the inclusion of a further set of control variables in our main regression model. We expand our regression model

$$(12)\ Y_i = \alpha + \beta_1 A_i + \beta_2 B_i + \beta_3 C_i + \beta_4 D_i + \varepsilon_i$$

with the term β_4 which represents a set of corporate governance indicators of the IPO firms. The way a company is run in terms of internal control mechanisms can be crucial in determining its success. A special focus is thereby laid on the mitigation of principal agency conflicts. The more mechanisms a company has in place aligning the interests of shareholders and management the higher is the probability that the company will achieve long-term success for its shareholders. Private Equity investors will therefore either look out for possible target companies with these structures in place or implement these structures after the initial investment. To control for these factors is thus crucial when analyzing the determinants of performance. To do so, we include four specific control variables aimed at catching the most important corporate governance mechanisms which mitigate principal agency conflicts. We include (1) a dummy variable indicating whether or not the company has an audit committee, (2) the number of outside directors, (3) the number of institutional investors before the IPO and (4) a dummy variable indicating whether or not the company's officers have stock ownership of the company or possess stock option plans. The first two variables capture the strength of a company's internal control mechanisms. An audit committee is usually as a sign that a company files correct annual reports. Outside directors monitor the work of a company's officers; a higher number of these directors can thus be regarded as a stronger monitoring mechanism. The third and fourth indicator serve as proxies for the interest alignment between shareholders and management. We keep the other main explanatory and control variables unchanged. The results of the models are displayed in Table 7 to Table 10 of the Appendix for model specifications (3) – (5). We find, that the number of external investors has a negative, whereas the variable "Directors as Shareholders + Stock Program for Directors" has a positive impact on the financial performance. Three things can be learned from these regression results: First, the negative causality of the number of external investors prior to the IPO and the results yielded so far are in line. More investors accumulate more reputation and thus amplify the signal to the capital market. Furthermore, in case of a lemon company, every Private Equity investor would loose his valuable reputation – so certification is stronger, the more participants certify the target's quality. Second, "Directors as Shareholders + Stock Program for Directors" reflect a direct involvement of the management in the company's success. Due to positive incentives and mitigation of moral hazard, this variable should have a positive impact of the company's financial performance, which we prove it to have. Third, although the two above given variables influence the performance at a statistically significant level, they do not capture the whole "PE effect". The PE dummy still remains highly significant.

5.3 Buyout- vs. venture-backed IPOs

To differentiate between Private Equity and non-Private Equity backed IPOs is important, yet the pure "PE vs. non-PE" comparison neglects the stark differences between different kinds of Private Equity investments. To account for that, we perform the paper's main analysis separately for buyout- and venture capital-backed IPOs. Many PE firms specialize in either of the two segments: buyout firms focus on more mature and bigger companies, acquiring large stakes in these companies and typically aim at increasing corporate value by restructuring the financing of the company, selling off unprofitable assets and/or increasing the efficiency of the most valuable assets of the companies to increase their profitability. The acquisitions are usually financed using large amounts of debt; the portfolio companies' cash flows are thus subsequently used to pay off this debt in order to increase the equity value for the PE investor. The main contribution of the PE firm to the value increase is consequently rooted in the PE firms' management skills. Venture deals on the other hand focus on young startup companies with little or no profits and only minimal revenues. The financing is supposed to get the companies "off the ground", i.e. to allow the companies to invest in their ideas and/or expand their business. Venture firms hence do not help the portfolio companies with debt restructuring and/or the sale of unprofitable assets. If at all, venture firms' investment managers help the startup founders in managing the company and leave the operating business to the founders or owners of the companies. These differences explain why we have to differentiate between buyout and venture deals to determine which kind of PE financing has the biggest influence on IPO companies' performance. To do so, we apply the same OLS regression model as in our main analysis, only exchanging the private equity dummy variable with a venture dummy variable, indicating whether the company has a venture (1) or buyout (0) financing. The model takes the form of:

$$(13)\ Y_i = \alpha + \beta_1 A_i + \beta_2 B_i + \beta_3 C_i + \varepsilon_i$$

Again we use the four main performance proxies RoA, RoS, CFOA and CFOS as dependent variables. In a second specification, we also test the model using the two stock indicators Volatility and Abnormal Return as dependent variables. It will be especially interesting to see the differences in the stock performance of the two groups. As explained above, the typical portfolio companies of the two PE segments strongly differ in their business models and key financial figures. Taking into account these differences, we will be able to determine whether

or not one of the two segments is able to offer more stable and profitable stocks to the market. The control variable set remains the same, corporate governance variables are included as well in all specifications. The results are reported in Table 15 of the Appendix. It can be learned from this robustness check, that the results remain unchanged if the Private Equity investment is split into Venture Capital and Buyout deals. This fact justifies that we differentiate between Private Equity in general and non-PE backed companies: a structural difference cannot just be attributed to one of these two distinct investment philosophies.

5.4 PE- and non-PE-backed companies over time

In a fourth step of the additional analyses we test the development of the IPO companies' performance over time. We specifically analyze the period of two years before the IPO to two years after the IPO. The idea behind the analysis is to detect whether or not Private Equity firms prepare their portfolio firms in a different way than companies without Private Equity firms would prepare for their IPO. We can also determine whether or not PE-backed companies perform better around the IPO date as compared to non-PE-firms.

We therefore test a dynamic panel regression model of the form

$$(14)\ \Delta(\mathrm{Y})_{\mathrm{n,t}} = \alpha_{\mathrm{n}} + \sum_{\mathrm{l}=1}^{\mathrm{L}} \beta_1 \Delta(\mathrm{PE})_{\mathrm{n,t-l}} + + \sum_{\mathrm{l}=1}^{\mathrm{L}} \beta_2 \Delta(\mathrm{CON})_{\mathrm{n,t-l}} \sum_{\mathrm{l}=1}^{\mathrm{L}} \beta_3 \Delta(\mathrm{DIFF})_{\mathrm{n,t-l}} + \mathrm{d_t} + \varepsilon_{\mathrm{n,t}}$$

in which the dependent variables $\Delta(\mathrm{Y})_{\mathrm{n,t}}$ are the annual changes of the four main performance variables RoA, RoS, CFOA and CFOS. To add further insight into the changes over time and especially surrounding the IPO date, we test the model in two different specifications. In both specifications we include the same set of main explanatory and control variables we also use in the OLS regression of our main analysis. These are the private equity dummy, the ranking of the private equity firms and the ownership stake ($\sum_{\mathrm{l}=1}^{\mathrm{L}} \beta_1 \Delta(\mathrm{PE})_{\mathrm{n,t-l}}$) and the main set of control variables ($\sum_{\mathrm{l}=1}^{\mathrm{L}} \beta_2 \Delta(\mathrm{CON})_{\mathrm{n,t-l}}$). In the second specification we additionally use the set of corporate governance variables introduced in part 5 of the paper. A further expansion of the model includes a difference-in-difference indicator. The purpose of a difference-in-difference analysis is to determine specific differences between two groups and over time, especially surrounding a so called "treatment" event. At this event one of the groups is supposed to undergo a certain "treatment" or experience an external effect the other group does not experience. The underlying notion is that the groups are similar prior to the event and one of

the groups changes as a consequence of the event whereas the other group does not change. The goal of the analysis is to subsequently determine to which degree the "treatment"-group changes as compared to the "non-treatment" (called "Control")-group before the event. The difference-in-difference indicator in a multivariate setting consists of three explanatory variables: (1) the main dummy variable specifying the group, (2) a dummy variable specifying the point of time, before the treatment event and afterwards and (3) the interaction term of both dummy variables. In our model specification, the first variable is the Private Equity dummy indicating whether or not an IPO company has a PE-investment at the time of the IPO. The second variable is a dummy indicating whether or not the time period is before or after the IPO date. The third variable is the interaction term of both, thereby indicating whether or not a company has successfully completed the public offering and has a PE investment. This variable will thus tell to which degree these companies differ in their performance after the IPO as compared to non-PE-companies before the IPO. Economically, the interpretation is straightforward: the variable shows to which degree – holding all other influence factors equal – a PE-backed company has performed from the period before to after the IPO in comparison to non-PE backed companies.

We test the model both for PE- and non-PE-backed companies. The results are presented in Tables 14 of the Appendix.

These findings strongly support the our main findings given above. Additionally, we check for Private Equity specific variables like the ranking of the PE investor and its stake in the target company. It can be learned from the Table, that the better the reputation and the higher the stake, the lower the performance of the target at the time of the IPO and vice versa. These results are in line with our prior findings stressing that Private Equity investors are able to take their targets public at an earlier point in time.

6 Conclusion

Private Equity – Blessing or Curse? After we have performed several analyses and conducted various robustness test, we have established a solid fundament to base our answer on. The key findings are as follows: On the IPO date, PE-backed companies have a lower financial performance than non PE-backed companies. For each of the performance measures, the

mean of the non-PE variable is higher than its PE-backed counterpart. This difference is statistically significant for three of the four profitability measures.

Averaged over the entire observation period of five years (where the IPO date is always right in the middle), PE-backed firms also trail non PE-backed firms in terms of performance.

However, when looking at the change in performance over the five-year period (measured as difference between year 5 and year 1 in the third row) we find that PE-backed companies increase profitability whereas average profitability of non-PE-backed companies actually declines.

They results are robust if we check for corporate governance variables, Private Equity specific variables, the dotcom bubble and its aftermath as well as potential difference in different kinds of PE backing, i.e. Buy Out deals and Venture Capital investments.

We thus conclude that Private Equity companies create value by selecting firms with below-average performance and by improving their performance substantially until and also beyond IPO date. Furthermore, we give support to the certification hypothesis which suggests that Private Equity companies ensure a high quality of their targets so that they can tap primary capital markets at an early point in time.

Moreover, our results are consistent with the window dressing theory, which posits that PE-backed companies have fewer incentives to whitewash the financial statement of their portfolio companies. The major reason is that PE companies would risk their reputation if window-dressing was detected, which would significantly reduce the income from any future IPO.

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Table 1: The Dataset – IPOs in Germany

The presented table provides a descriptive overview over the sample of 247 IPOs in Germany over the period 2000-2007 which is being used for the analyses in this paper. We report the IPOs split by sector, year, PE/non-PE and Buyout/Venture, for each categorization reporting the number (total and in percent), the average age, the average placement volume, the average underpricing and the number of Private Equity deals in each category.

Sector	No.	%	Age	Issue Volume	Average Underpricing	# PE IPOs	PE Length
Construction	2	0.81	125	94	.07	1	10
Chemicals	4	1.62	62.3	731	2.51	2	3.5
Energy/Commodities	2	0.81	14.5	149	1.65	0	0.5
Financial Services	29	11.74	38.1	388	2.01	6	4.5
Commerce/Trade	9	3.64	18	152	14.6	4	4.3
Industrials	51	20.65	27.9	136	4.56	24	2
Consumer Goods	7	2.83	24.4	55	1.02	1	2
Media	21	8.50	11.3	253	5.82	8	0.6
Pharma/Healthcare	28	11.34	11.9	60	9.29	22	2.7
Software	60	24.22	10.5	96	14.4	31	1.4
Technology	18	7.29	18.8	1,260	9.48	6	2.3
Telecommunications	7	2.83	3.7	1,100	6.15	3	1.5
Transport/Logistics	9	3.64	39.8	1,880	3.31	2	1.5
Total/Average	**247**	**100**	**31.3**	**489**	**5.75**	**110**	
Year							
2007	19	7.69	36.6	236	1.47	7	2.8
2006	34	13.77	36.8	204	.88	18	3.4
2005	14	5.67	15	282	4.48	9	3.5
2004	4	1.62	35.6	492	.22	2	5
2003	0	-	-	-	-	-	
2002	6	2.43	16.3	37	.97	1	1
2001	20	8.10	46.7	159	1.67	6	1.7
2000	150	60.73	14.24	181	11.9	67	1.7
PE/Non-PE							
Private Equity	110	44.5	20.9	132	7.37	-	
Non-Private Equity	137	55.5	23.5	243	8.13	-	
Buyout/Venture							
Buyout	21	19.1	54	357	0.54	-	2.7
Venture	89	80.9	13.1	81	8.98	-	2.2

Table 2: Variable Description

The presented table gives an overview over the used variables in this paper's analyses. We report the name of the variables as well as the unit it is used in, together with a description of how the variable is calculated and/or what it contains.

Variable Name	Unit	Description
Return on Assets (RoA)	%	The ratio of return to total assets, as calculated by net income divided by total assets
Return on Sales (RoS)	%	The ratio of return to sales, as calculated by net income divided by total revenues
Cash Flow on Assets (CFoA)	%	The ratio of operating cash flow to assets. Operating cash flow is calculated as (net income + depreciations - investments)
Cash Flow on Sales (CFoS)	%	The ratio of operating cash flow to revenues. Operating cash flow is calculated as (net income + depreciations - investments)
Stock Volatility	SD	The standard deviation of a company's stock return in the first five (twenty) trading days following the IPO
Abnormal Return	%	A stock's return above DAX
PE Dummy	0/1	Dummy variable indicating whether or not a company had a Private Equity investor or not
Private Equity Firm Ranking	Rank	The ranking of Private Equity firms in our sample as displayed on Table 14 of the Appendix
Percent Private Equity Stake	%	The ownership percentage a Private Equity firm holds in its portfolio company
Tech Venture Dummy	0/1	A dummy variable indicating if a company is active in the technology sector and obtains a venture financing
Bubble Venture Dummy	0/1	A dummy variable indication if a company went public during the New Economy Bubbly and had venture financing
Number of Outside Board Members	Number	The number of outside (independent) board members a company has. In Germany, this counts the number of "Aufsichtsratmitglieder"
Audit Committee	0/1	Dummy variable indicating if a company has an audit committee
Number of Inst. Investors Pre-IPO	Number	The number of institutional shareholders a company had prior to its IPO
Directors as Shareholders + Stock Program	0/1	Dummy variable indicating if a company has a stock option plan for its officers or if the officers are stockholders of the company
Buyout Dummy	0/1	Dummy variable indicating if a PE-backed company had either a buyout or a Venture Capital investment
Pre-IPO-Dummy	0/1	Dummy variable indicating whether or not the panel-data time period was before or after the IPO year
Interaction Term	0/1	Dummy variable which is the interaction term of the private equity and pre-IPO-dummy

Underwriter Ranking	Rank	The ranking of underwriting banks involved in the IPOs as displayed in Table 15 of the Appendix
Placement Volume (log)	mn. EUR	The placement volume of an IPO as calculated by (number of shares issued x offer price)
Bookbuilding Dummy	0/1	Dummy variable indicating if bookbuilding was used for the respective IPO
Bookbuilding Price Span	EUR	The difference between the upper and lower bound of the bookbuilding price span
Number of Underwriters	Number	The number of underwriting banks in each respective IPO
IPO Company Age $_{\text{IPO Date}}$	Number	The age of the IPO company at the IPO date
# Shareholders pre-IPO	Number	The total number of shareholders before the IPO
Total Revenues $_{\text{IPO Date}}$ (log)	mn. EUR	Total revenues of each IPO company
Interest Exp. Debt $_{\text{IPO Date}}$	mn. EUR	Interest payments for debt of each IPO company
Cash Holdings $_{\text{IPO Date}}$	mn. EUR	Cash holdings of each IPO company
CAPEX $_{\text{IPO Date}}$	mn. EUR	Capital Expenditures of each IPO company
# of Employees $_{\text{IPO Date}}$	Number	Number of employees of each IPO company
GDP Germany	bn. EUR	Gross Domestic Product (GDP) of Germany at IPO date of each IPO company
DAX End-of-Day	Index	German Stock Index (DAX) listing end-of-day price at the date of each IPO
New Economy Dummy	0/1	Dummy variable indicating if the deal took place during the New Economy Bubble (year 2000)

Table 3: Operating Performance of Private Equity-backed and non-Private Equity-backed IPOs – Unmatched Sample Comparison

The presented table gives a descriptive overview over the four main balance sheet performance measures - RoA, RoS, CFOA and CFOS - used as dependent variables in this paper's analyses. We report the numbers for the whole sample over the total period as well as without the year 2000. We also report the PE/non-PE and Buyout/Venture deals. For each time period and variable we report the mean at the IPO date, the mean over whole five year period surrounding the IPO and the absolute change over the five year period. The differences between the groups are given by t-tests.

		Return on Assets			**Return on Sales**			**Cash Flow on Assets**			**Cash Flow on Sales**		
		All Deals			All Deals			All Deals			All Deals		
Total Sample	Mean $_{\text{IPO Date}}$	-.0663			-1.475			-.0660			-.4987		
	Mean $_{\text{Whole Period}}$	-.2107			-.9051			-.0543			-.3928		
	Δ Absolute	.1005			.6711			-.0211			.3132		
Without New Economy (2001-2007)	Mean $_{\text{IPO Date}}$	.0552			.0199			.0121			-.1497		
	Mean $_{\text{Whole Period}}$	-.3853			-1.59			-.0989			-.5759		
	Δ Absolute	.2488			1.17			-.0277			.4436		
		PE	Non-PE	Diff.	PE	Non-PE	Diff.	PE	Non-PE	Diff.	PE	Non-PE	Diff.
Total Sample	Mean $_{\text{IPO Date}}$	-.0856	-.0508	.0347	-2.96	-.2770	2.69***	-.0977	-.0406	.0571***	-.9171	-.1624	.7552***
	Mean $_{\text{Whole Period}}$	-.2597	-.1719	.0877**	-1.94	-.0795	1.86***	-.0970	-.0204	.0766***	-.6476	-.1910	.4560***
	Δ Absolute	.4118	-.1462	-.5581***	2.08	-.4524	-2.54***	.0441	-.0728	-.1169***	.2377	.3730	.1353
Without New Economy (2001-2007)	Mean $_{\text{IPO Date}}$	.0548	.0558	-.0010	.1058	-.1772	.2830***	-.0171	-.0058	-.0113***	-.1157	-.1922	.0764***
	Mean $_{\text{Whole Period}}$	-.0017	.0825	.0842**	-.3221	.4068	.7290***	-.0140	.0352	.0492	-.28566	1.012	1.298***
	Δ Absolute	-.0187	-.1941	-.1754***	.3568	-.4096	-.7665***	.0029	-.0272	-.0301***	.2218	-2.16	-2.38***
		Buyout	Venture	Diff.	Buyout	Venture	Diff.	Buyout	Venture	Diff.	Buyout	Venture	Diff.
Total Sample	Mean $_{\text{IPO Date}}$	.0990	-.1292	.2282***	.0776	-3.68	3.76***	.0700	-.1373	.2073***	.0779	-1.15	1.23***
	Mean $_{\text{Whole Period}}$	.0898	-.3451	-.4349***	.1451	-2.45	-2.60***	.0675	-.1373	-.2049***	.0560	-.8194	-.8754***
	Δ Absolute	-.1183	.5413	.6597***	.0527	2.58	2.53*	-.0507	.0672	.1180***	.0601	.2810	.2209
Without New Economy (2001-2007)	Mean $_{\text{IPO Date}}$	.0981	.0205	.0776	.0745	-.3869	.4615***	.0668	-.0663	.1331***	.0737	-.4138	.4875***
	Mean $_{\text{Whole Period}}$	.0894	.0338	.0555	.1461	.0668	.0792***	.0635	.0005	.0629***	.0493	.5333	-.4840
	Δ Absolute	-.1245	-.1140	-.0105	.0536	-.1000	.1537	-.0532	-.0038	-.0494	.0610	-1.39	1.45

Table 4: Operating Performance of Private Equity-backed and non-Private Equity-backed IPOs – Matched Sample Comparison

The presented table gives a descriptive overview over the three main stock performance measures – Stock volatility, period return and abnormal return - used as dependent variables in this paper's analyses. We report the numbers for the whole sample over the total period as well as without the year 2000. We also report the PE/non-PE and Buyout/Venture deals. For each time period we report the numbers for the first five and twenty trading days after the IPO. Differences between the groups are given by t-tests.

		Stock Volatility			**Period Return**			**Abnormal Return**		
		All Deals			All Deals			All Deals		
Total Sample	First 5 days	.1301803			.2982949			.2977819		
	First 20 days	.0753346			.277701			.2807403		
New Economy	First 5 days	.1799592			.4686822			.4684137		
	First 20 days	.1008308			.4566432			.4651007		
		PE	Non-PE	Diff.	PE	Non-PE	Diff.	PE	Non-PE	Diff.
Total Sample	First 5 days	.131664	.1290037	-.0026611	.3460687	.2595101	-.08655**	.3468125	.2598402	-.086972**
	First 20 days	.076593	.0743365	-.0022573	.3779311	.2037075	-.1742***	.3751416	.2004703	-.17467***
New Economy	First 5 days	.185208	.1758765	-.0093321	.5332393	.4179938	-.11524**	.5334461	.4183103	-.115135**
	First 20 days	.104014	.0983548	-.0056595	.6162078	.3475729	-.2686***	.6127004	.3352654	-.27743***
		Buyout	Venture	Diff.	Buyout	Venture	Diff.	Buyout	Venture	Diff.
Total Sample	First 5 days	.043082	.1384565	.095374***	.0416649	.3221188	.28045***	.0479355	.3220847	.274149***
	First 20 days	.026627	.0799628	.053335***	.019462	.3055676	.28610***	.0335217	.3009036	.267381***
New Economy	First 5 days	.061211	.1807897	.1195786	.3597001	.4691739	.1094739	.3526316	.4694938	.1168622
	First 20 days	.049993	.1011863	.0511925	.3147948	.4661518	.1513569	.3289474	.4575362	.1285889

Table 5: Probit Model of having a Private Equity investment

The presented table shows the results of our probit model estimation to determine the firms' propensity scores. We report for each used variable the coefficient, z and p Score. At the bottom of the table we additionally report the characteristics of the calculated propensity scores. We display the properties of the distribution, both by percentiles and groups.

Variable Name	Coefficient	z Score	p Score
Return on Assets $_{\text{PE Inv. Date}}$	-0.003401***	-4.01	0.000
Return on Sales $_{\text{PE Inv. Date}}$	-0.634562***	-3.69	0.000
Cash Flow on Assets $_{\text{PE Inv. Date}}$	-0.026532**	-2.16	0.042
Cash Flow on Sales $_{\text{PE Inv. Date}}$	-0.009535**	-2.23	0.000
Revenues $_{\text{PE Inv. Date}}$	-1.91E-06*	-1.88	0.060
Depreciations $_{\text{PE Inv. Date}}$	5.93E-06	0.60	0.853
Operating Income $_{\text{PE Inv. Date}}$	0.0000049	0.74	0.842
Interest Expense Debt $_{\text{PE Inv. Date}}$	0.0010433***	3.11	0.002
Cash $_{\text{PE Inv. Date}}$	-5.81E-06	-1.1	0.532
Total Assets $_{\text{PE Inv. Date}}$	-8.99E-07**	-1.96	0.050
Shareholder Equity $_{\text{PE Inv. Date}}$	-6.38E-06	-1.49	0.135
Operating Cash Flow $_{\text{PE Inv. Date}}$	-0.0000124**	-2.49	0.013
Capital Expenditure $_{\text{PE Inv. Date}}$	1.44E-06	0.41	0.843
Number of Employees $_{\text{PE Inv. Date}}$	-0.0002652**	-2.12	0.045
Company Age $_{\text{PE Inv. Date}}$	-0.0036564***	-4.31	0.000
Tech Dummy $_{\text{PE Inv. Date}}$	0.0452001*	1.78	0.075
Number of Shareholders $_{\text{PE Inv. Date}}$	-0.0299043*	-1.95	0.055
Number of Outside Board Members $_{\text{PE Inv. Date}}$	-0.0286122	-0.57	0.550
Audit Committee $_{\text{PE Inv. Date}}$	0.40654140	0.42	0.758
Number Institutional Shareholders $_{\text{PE Inv. Date}}$	0.4099524***	5.7	0.000
Share Ownership Directors $_{\text{PE Inv. Date}}$	1.246246***	3.95	0.000

Estimated Propensity Score

1%	2.40e-87	Observation	247	p Score	Non-PE	PE	Total
5%	.0001104						
10%	.0268993	Mean	.4510844	0	59	7	66
25%	.1994726	Std. Dev.	.3225616	.2	52	12	64
50%	.3931636	Variance	.104046	.4	17	21	38
75%	.6955374	Skewness	.3885965	.6	6	26	32
90%	.9968849	Kurtosis	1.935826	.8	3	44	47
99%	1			Total	137	110	247

Table 6: Sample Matching

The presented table shows the results of our propensity score matching analysis based on the probit model in Table 5. We apply nearest neighbor matching, both with the five and ten nearest neighbors. For each pair of neighbors we calculate bootstrapped standard errors with 100 and 1000 repetitions. For each specification we report the coefficient, standard error and p Score.

Procedure/Variable		Bootstrap	Coefficient	Standard Error	p Score
Return on Assets$_5$	$t_{\text{PE Inv. Date}}$	100	-.0541862	.0385078	0.159
		1000	-.0541862	.0395359	0.171
	$t_{\text{IPO Date}}$	100	-3.03734	1.01418	0.217
		1000	-3.03734	1.61855	0.266
	$t_{\text{End Lock-Up}}$	100			
		1000			
Return on Assets$_{10}$	$t_{\text{PE Inv. Date}}$	100	-.0475595	.0374635	0.204
		1000	-.0475595	.0372353	0.202
	$t_{\text{IPO Date}}$	100	-2.40328	3.19646	0.326
		1000	-2.40328	4.47642	0.436
	$t_{\text{End Lock-Up}}$	100			
Return on Sales$_5$	$t_{\text{PE Inv. Date}}$	100	-2.868431	2.106732	0.173
		1000	-2.868431	2.06682	0.165
	$t_{\text{IPO Date}}$	100	-3.938751	1.344552	0.003***
		1000	-3.938751	1.417406	0.005***
	$t_{\text{End Lock-Up}}$	100			
		1000			
Return on Sales$_{10}$	$t_{\text{PE Inv. Date}}$	100	-2.882295	2.475426	0.244
		1000	-2.882295	2.075171	0.165
	$t_{\text{IPO Date}}$	100	-3.909694	1.331315	0.003***
		1000	-3.909694	1.380001	0.005***
	$t_{\text{End Lock-Up}}$	100			
		1000			

Table 6: Sample Matching (continued)

Procedure/Variable		Bootstrap	Coefficient	Standard Error	p Score
Cash Flow on $Assets_5$	$t_{PE\ Inv.\ Date}$	100	-2.745245	2.298476	0.232
		1000	-2.745245	2.622401	0.295
	$t_{IPO\ Date}$	100	-.0705755	.0347258	0.002***
		1000	-.0705755	.0409623	0.005***
	$t_{End\ Lock\text{-}Up}$	100			
		1000			
Cash Flow on $Assets_{10}$	$t_{PE\ Inv.\ Date}$	100	-1.89531	1.57023	0.227
		1000	-1.89531	1.944579	0.330
	$t_{IPO\ Date}$	100	-.0677864	.0434548	0.000***
		1000	-.0677864	.0395292	0.000***
	$t_{End\ Lock\text{-}Up}$	100			
		1000			
Cash Flow on $Sales_5$	$t_{PE\ Inv.\ Date}$	100	-.1504215	1.028788	0.884
		1000	-.1504215	.9599323	0.875
	$t_{IPO\ Date}$	100	-.8489151	.4442972	0.056*
		1000	-.8489151	.396547	0.032**
	$t_{End\ Lock\text{-}Up}$	100			
		1000			
Cash Flow on $Sales_{10}$	$t_{PE\ Inv.\ Date}$	100	-.7467798	.8753995	0.394
		1000	-.7467798	.8410332	0.375
	$t_{IPO\ Date}$	100	-.8381224	.4261226	0.049**
		1000	-.8381224	.4113514	0.042**
	$t_{End\ Lock\text{-}Up}$	100			
		1000			

Table 7: OLS Regression Results – Return on Assets

The presented table displays the results of the multivariate OLS regression analysis with the RoA as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Return on Assets				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	-0.01548**	-0.0829648**	-0.1473453*	-0.0103093**	-0.2003797
	[0.035]	[0.013]	[0.053]	[0.024]	[0.103]
Private Equity Firm Ranking		-0.0002692**	-0.0008007*	-0.0010545**	-0.0007226*
		[0.028]	[0.100]	[0.020]	[0.084]
Percent Private Equity Stake		-0.2607635**	-0.2331414**	-0.1206377*	-0.2933331***
		[0.050]	[0.042]	[0.063]	[0.008]
Length of PE Investm. $_{\text{IPO Date}}$		0.0000221*	4.51E-06*	-2.25E-06**	0.0000191**
		[0.082]	[0.054]	[0.013]	[0.042]
Tech Venture Dummy		-0.0884752***	-0.0686176***	-0.0665594***	-0.0626052***
		[0.000]	[0.000]	[0.000]	[0.000]
Bubble Venture Dummy		-0.1170497***	-0.1802762***	-0.0240567***	-0.0796006***
		[0.000]	[0.000]	[0.000]	[0.000]
Number of Outside Board Members			-0.0290903	-0.0082859	-0.031575
			[0.439]	[0.380]	[0.912]
Audit Committee			-0.0354133	0.0268305	-0.0501472
			[0.104]	[0.424]	[0.836]
Number of Inst. Investors Pre-IPO			-0.0007409***	-0.0054433***	-0.0072179***
			[0.000]	[0.000]	[0.000]
Directors as Shareholders + Stock Program for Directors			0.088286***	0.1602471***	0.0693166***
			[0.000]	[0.000]	[0.000]
Underwriter Ranking	0.299181**	1.354233***	1.44272**	1.122129**	1.649212***
	[0.038]	[0.000]	[0.014]	[0.043]	[0.000]
Placement Volume (log)	-0.02967***	-0.0343752***	-0.0307705***	-0.0656872***	-0.0398724***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Bookbuilding Price Span	0.0000337	-0.0094062	-0.0110174	-0.0046747	-0.0099971
	[0.984]	[0.952]	[0.952]	[0.843]	[0.833]
Number of Underwriters	0.0091823*	0.0086701**	0.0242958**	0.0111577*	0.0114355**
	[0.061]	[0.050]	[0.043]	[0.088]	[0.033]
IPO Company Age $_{\text{IPO Date}}$	-0.000041	-0.0010433	-0.0001985	-0.0003066	-0.0000206
	[0.153]	[0.243]	[0.275]	[0.200]	[0.154]
Total Revenues $_{\text{IPO Date}}$ (log)	0.048364	0.0566302	0.0570088	0.0796766	0.0589933
	[0.453]	[0.176]	[0.634]	[0.654]	[0.400]
Interest Exp. Debt $_{\text{IPO Date}}$	-4.78E-0***	-2.54E-06***	-2.81E-06***	-2.99E-06***	-3.49E-06***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CAPEX $_{\text{IPO Date}}$	-1.58E-0***	-3.55E-07***	-2.17E-07***	-4.14E-07***	-4.98E-07***
	[0.001]	[0.000]	[0.000]	[0.000]	[0.000]
# of Employees $_{\text{IPO Date}}$	-4.89E-07	9.40E-07	7.59E-07	3.02E-07	6.50E-07
	[0.398]	[0.102]	[0.242]	[0.249]	[0.103]
GDP Germany	0.0007429	0.002492	0.0021165	0.0016871	0.0002264
	[0.149]	[0.324]	[0.298]	[0.477]	[0.404]
DAX End-of-Day	0.000010***	0.0000459	0.0000351	0.0000157	0.0000288
	[0.005]	[0.520]	[0.134]	[0.109]	[0.384]
New Economy Dummy	-0.13682**	-0.054778**	-0.1097691*	-0.1312571*	-0.1763238**
	[0.014]	[0.043]	[0.080]	[0.077]	[0.043]
Number of Observations	247	247	247	247	247
R-Squared (Adjusted)	0.280	0.407	0.442	0.494	0.450

Table 8: OLS Regression Results – Return on Sales

The presented table displays the results of the multivariate OLS regression analysis with the RoS as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Return on Sales				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	-0.50690***	-3.689582***	-7.04292***	-3.523743***	-11.8236***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Private Equity Firm Ranking		-0.0159529**	-0.0843374***	-0.1034273***	-0.04439***
		[0.010]	[0.001]	[0.002]	[0.008]
Percent Private Equity Stake		-6.75788***	-5.621896***	-6.401204***	-0.24884***
		[0.000]	[0.000]	[0.000]	[0.002]
Length of PE Investm. $_{\text{IPO Date}}$		0.0025371***	0.00288***	0.0025413***	0.002698***
		[0.000]	[0.000]	[0.000]	[0.000]
Tech Venture Dummy		-3.616661**	-3.748509**	-2.353577***	-3.73702***
		[0.026]	[0.040]	[0.005]	[0.001]
Bubble Venture Dummy		-4.013685***	-0.178553***	-2.335549***	-8.98430***
		[0.000]	[0.000]	[0.000]	[0.000]
Number of Outside Board Members			-1.519124	-1.020085	-0.8603396
			[0.841]	[0.500]	[0.914]
Audit Committee			9.507002	5.882058	6.013671
			[0.543]	[0.134]	[0.879]
Number of Inst. Investors Pre-IPO			-0.4401595***	-0.3443376***	-0.38736***
			[0.000]	[0.000]	[0.000]
Directors as Shareholders + Stock Program for Directors			4.851815***	3.609579***	2.907952***
			[0.000]	[0.000]	[0.000]
Underwriter Ranking	0.948519**	45.40537***	51.16875***	50.51627**	32.04733**
	[0.040]	[0.008]	[0.000]	[0.013]	[0.042]
Placement Volume (log)	-0.80228***	-5.087967***	-7.575885***	-5.863614**	-5.21673***
	[0.000]	[0.000]	[0.000]	[0.032]	[0.003]
Bookbuilding Price Span	-0.1579698	-2.249492	-1.632195	-1.648117	-2.158863
	[0.364]	[0.543]	[0.600]	[0.435]	[0.465]
Number of Underwriters	0.0069678*	0.5436023*	1.166583**	1.21349*	1.446351**
	[0.081]	[0.054]	[0.032]	[0.079]	[0.030]
IPO Company Age $_{\text{IPO Date}}$	0.065006	-0.0641809	-0.0281205	-0.0329065	-0.0491993
	[0.210]	[0.153]	[0.421]	[0.142]	[0.145]
Total Revenues $_{\text{IPO Date}}$ (log)	-0.00008	6.552615	6.869897	5.710492	6.662378
	[0.523]	[0.845]	[0.432]	[0.943]	[0.928]
Interest Exp. Debt $_{\text{IPO Date}}$	-0.779555***	-0.0002091***	-0.0001272***	-0.0001609***	-0.00011***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CAPEX $_{\text{IPO Date}}$	-2.70E-06***	-7.79E-06***	-6.41E-06***	-0.0000175***	-0.00002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
# of Employees $_{\text{IPO Date}}$	-9.71E-07	-0.000096	-0.0001496	-0.0001287	-0.0001115
	[0.110]	[0.152]	[0.194]	[0.163]	[0.432]
GDP Germany	1.79E-08	-0.0257672	-0.0628629	0.0251251	0.07894
	[0.452]	[0.543]	[0.233]	[0.704]	[0.653]
DAX End-of-Day	0.0000355	0.0034875	0.004739	0.0026471	0.0044522
	[0.211]	[0.323]	[0.245]	[0.200]	[0.153]
New Economy Dummy	-0.0009823*	-12.78832**	-11.90861*	-5.716035*	2.19365*
	[0.088]	[0.043]	[0.053]	[0.084]	[0.090]
Number of Observations	247	247	247	247	247
R-Squared (Adjusted)	0.301	0.437	0.453	0.373	0.463

Table 9: OLS Regression Results – Cash Flow on Assets

The presented table displays the results of the multivariate OLS regression analysis with the CFOA as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Cash Flow on Assets				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	-0.04472***	-0.2086398***	-0.2324909***	-741.5072***	-0.08371***
	[0.006]	[0.000]	[0.000]	[0.000]	[0.000]
Private Equity Firm Ranking		-0.0000355***	-0.0001202***	-10.01221***	-0.00004***
		[0.000]	[0.000]	[0.000]	[0.000]
Percent Private Equity Stake		-0.1401092***	-0.144787***	-195.6874***	-0.15982***
		[0.000]	[0.008]	[0.010]	[0.003]
Length of PE Investm. $_{\text{IPO Date}}$		8.69E-07***	9.63E-06***	0.0290944***	0.000016***
		[0.000]	[0.000]	[0.000]	[0.000]
Tech Venture Dummy		-0.0802726***	-0.0738295***	-463.9456***	-0.07096***
		[0.000]	[0.000]	[0.000]	[0.000]
Bubble Venture Dummy		-0.2203772***	-0.2525678***	-539.6167***	-0.05457***
		[0.000]	[0.000]	[0.000]	[0.000]
Number of Outside Board Members			-0.0093032	62.00904	-0.0087106
			[0.129]	[0.423]	[0.800]
Audit Committee			-0.0407634	-392.0647	-0.0614287
			[0.520]	[0.123]	[0.103]
Number of Inst. Investors Pre-IPO			-0.000884***	-12.70487***	-0.00255***
			[0.000]	[0.000]	[0.000]
Directors as Shareholders + Stock Program for Directors			0.0962995***	241.583***	0.083502***
			[0.000]	[0.000]	[0.000]
Underwriter Ranking	0.14741**	0.5745128***	0.6434021***	909.5307**	0.728805**
	[0.021]	[0.008]	[0.000]	[0.013]	[0.042]
Placement Volume (log)	-0.00308***	-0.0061334***	-0.0141402***	-192.0658**	-0.01229***
	[0.000]	[0.000]	[0.000]	[0.032]	[0.003]
Bookbuilding Price Span	-0.02480	-0.000484	-0.0026682	-94.95372	-0.0032412
	[0.600]	[0.712]	[0.234]	[0.224]	[0.524]
Number of Underwriters	0.0031578*	0.0085415*	0.0151698**	78.14242**	0.0092288*
	[0.068]	[0.053]	[0.034]	[0.040]	[0.080]
IPO Company Age $_{\text{IPO Date}}$	0.009187	-0.000579	-0.0003475	-5.264823	-0.000258
	[0.110]	[0.349]	[0.134]	[0.323]	[0.510]
Total Revenues $_{\text{IPO Date}}$ (log)	8.57E-07	0.0079897	0.0063431	193.1521	0.0086899
	[0.340]	[0.521]	[0.842]	[0.900]	[0.459]
Interest Exp. Debt $_{\text{IPO Date}}$	-0.01744***	-4.43E-07***	-1.19E-06***	-0.0103671***	-1.64E-0***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CAPEX $_{\text{IPO Date}}$	-3.04E-0***	-2.03E-07***	-1.55E-07***	-0.0040806***	-3.12E-0***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
# of Employees $_{\text{IPO Date}}$	8.35E-09	8.63E-08	2.06E-07	0.006499	2.05E-07
	[0.451]	[0.424]	[0.200]	[0.411]	[0.412]
GDP Germany	3.18E-08	0.0021379	0.0021135	15.5887	0.0016365
	[0.106]	[0.523]	[0.103]	[0.259]	[0.184]
DAX End-of-Day	-7.78E-07	0.0000347	0.0000221	-0.1784711	0.0000127
	[0.450]	[0.203]	[0.159]	[0.189]	[0.329]
New Economy Dummy	-0.00148***	-0.2139544*	-0.2579767**	-558.1705*	-0.080012*
	[0.005]	[0.053]	[0.042]	[0.082]	[0.060]
Number of Observations	247	247	247	247	247
R-Squared (Adjusted)	0.103	0.356	0.382	0.390	0.373

Table 10: OLS Regression Results – Cash Flow on Sales

The presented table displays the results of the multivariate OLS regression analysis with the CFOS as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Cash Flow on Sales				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	-0.2849794***	-0.1694605***	-1.233411***	-4.21645***	-2.045798***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Private Equity Firm Ranking		-0.0110997***	-0.0178284***	-0.0545515***	-0.0179945***
		[0.000]	[0.000]	[0.000]	[0.000]
Percent Private Equity Stake		-1.986557***	-1.266855***	-3.485734***	-0.490333***
		[0.000]	[0.000]	[0.000]	[0.000]
Length of PE Investm. $_{\text{IPO Date}}$		0.0007091***	0.0005559***	0.0018469***	0.0006978***
		[0.000]	[0.000]	[0.000]	[0.000]
Tech Venture Dummy		0.5534761***	0.678471***	2.476963***	0.6226589***
		[0.000]	[0.000]	[0.000]	[0.000]
Bubble Venture Dummy		0.4659099***	-0.2335863***	-0.1104723***	-1.454613***
		[0.000]	[0.000]	[0.000]	[0.000]
Number of Outside Board Members			-0.3264232	-0.8538807	-0.2749374
			[0.923]	[0.200]	[0.853]
Audit Committee			1.786457	5.45239	1.70449*
			[0.205]	[0.420]	[0.106]
Number of Inst. Investors Pre-IPO			-0.0311596***	-0.3753779***	-0.0232062***
			[0.000]	[0.000]	[0.000]
Directors as Shareholders + Stock Program for Directors			1.07689***	2.529058***	0.9612536***
			[0.000]	[0.000]	[0.000]
Underwriter Ranking	0.7754768***	10.79735**	10.73895***	31.96017**	8.616857**
	[0.002]	[0.021]	[0.000]	[0.042]	[0.043]
Placement Volume (log)	-0.2768152***	-1.313212**	-1.53853**	-4.075528***	-1.414322**
	[0.000]	[0.032]	[0.042]	[0.000]	[0.038]
Bookbuilding Price Span	-0.1548528	-0.3096803	-0.2416257	-1.023774	-0.2680476
	[0.130]	[0.154]	[0.532]	[0.412]	[0.124]
Number of Underwriters	0.0091515**	0.1259965	0.1590583**	0.7415758**	0.2812594**
	[0.022]	[0.102]	[0.012]	[0.040]	[0.023]
IPO Company Age $_{\text{IPO Date}}$	0.0203443	-0.0125582	-0.0051978	-0.0197412	-0.0067709
	[0.135]	[0.499]	[0.143]	[0.332]	[0.513]
Total Revenues $_{\text{IPO Date}}$ (log)	-4.64E-07*	1.52354	1.592314	3.918227	1.59636
	[0.086]	[0.850]	[0.535]	[0.923]	[0.500]
Interest Exp. Debt $_{\text{IPO Date}}$	-0.3628909***	-0.0000433	-0.0000238	-0.00009	-0.0000194
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
CAPEX $_{\text{IPO Date}}$	-8.92E-07***	-5.54E-06***	-6.48E-06***	-1.09E-06***	-8.73E-06***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
# of Employees $_{\text{IPO Date}}$	2.19E-08	-0.00002	-0.0000265	-0.0000925	-0.0000247
	[0.741]	[0.313]	[0.101]	[0.243]	[0.324]
GDP Germany	-1.85E-07	-0.0110339	-0.017428	-0.0223971	0.0068791
	[0.282]	[0.233]	[0.410]	[0.213]	[0.143]
DAX End-of-Day	-3.05E-06	0.0007684	0.0010593	0.0026559	0.0010147
	[0.273]	[0.432]	[0.371]	[0.140]	[0.399]
New Economy Dummy	-0.0041897**	-2.857329**	-2.409937**	-5.775727*	-0.4249861**
	[0.026]	[0.012]	[0.041]	[0.068]	[0.032]
Number of Observations	247	247	247	247	247
R-Squared (Adjusted)	0.276	0.450	0.474	0.364	0.479

Table 11: OLS Regression Results – Stock Volatility

The presented table displays the results of the multivariate OLS regression analysis with the Stock Volatility as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Stock Volatility				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	0.013467	-0.0103265	-0.0395014		-0.0146197
	[0.437]	[0.700]	[0.436]		[0.609]
Private Equity Firm Ranking		0.0003521	0.0001709		0.0001768
		[0.285]	[0.622]		[0.608]
Percent Private Equity Stake		-0.0113775	-0.024554		-0.0319189
		[0.773]	[0.337]		[0.274]
Length of PE Investm. $_{\text{IPO Date}}$		-2.23E-06	-0.0000108		-9.87E-06
		[0.764]	[0.298]		[0.375]
Tech Venture Dummy		0.0098461	0.0053157		0.0056521
		[0.552]	[0.754]		[0.739]
Bubble Venture Dummy		0.0126626	0.0231233		0.0157954
		[0.470]	[0.521]		[0.705]
Number of Outside Board Members			0.0052796		0.004619
			[0.207]		[0.274]
Audit Committee			-0.0019367		0.001254
			[0.925]		[0.951]
Number of Inst. Investors Pre-IPO			0.0028141		0.0030708
			[0.176]		[0.156]
Directors as Shareholders + Stock Program for Directors			0.0023457		0.0022974
			[0.861]		[0.866]
Underwriter Ranking	0.1146197	0.0920989	0.0916306		0.1069513
	[0.420]	[0.203]	[0.196]		[0.143]
Placement Volume (log)	-0.0072676	-0.0047795	-0.0028337		-0.004072
	[0.582]	[0.678]	[0.780]		[0.690]
Bookbuilding Price Span	-0.086389*	-0.0024495	-0.0021344		-0.0017662
	[0.090]	[0.340]	[0.442]		[0.539]
Number of Underwriters	0.0022024	-0.0004563	-0.0035117		-0.004283
	[0.238]	[0.974]	[0.416]		[0.398]
IPO Company Age $_{\text{IPO Date}}$	0.0001554	1.71E-06	-0.0001431		-0.0001345
	[0.974]	[0.479]	[0.381]		[0.438]
Total Revenues $_{\text{IPO Date}}$ (log)	-9.57E-0***	-0.0023447	-0.0006962		-0.0009975
	[0.000]	[0.711]	[0.895]		[0.849]
Interest Exp. Debt $_{\text{IPO Date}}$	-0.0003652	4.44E-08	-3.94E-08		-4.05E-08
	[0.961]	[0.807]	[0.903]		[0.890]
CAPEX $_{\text{IPO Date}}$	7.41E-08	-1.85E-07	-1.50E-07		-1.41E-07
	[0.298]	[0.143]	[0.295]		[0.324]
# of Employees $_{\text{IPO Date}}$	3.05E-10	-1.03E-06***	-8.94E-07***		-9.16E-07***
	[0.987]	[0.002]	[0.008]		[0.007]
GDP Germany	5.81E-08	-0.0024079**	-0.0021263**		-0.0023562**
	[0.177]	[0.019]	[0.042]		[0.037]
DAX End-of-Day	-6.79E-07	0.0000367***	0.0000364***		0.000038***
	[0.350]	[0.004]	[0.010]		[0.005]
New Economy Dummy	-0.00279***	-0.1542195*	-0.1470724		-0.1507664
	[0.009]	[0.081]	[0.111]		[0.156]
Number of Observations	247	247	247		247
R-Squared (Adjusted)	0.247	0.366	0.379		0.377

Table 12: OLS Regression Results – Abnormal Stock Returns

The presented table displays the results of the multivariate OLS regression analysis with the Abnormal Returns as dependent variable. We test six specifications, all using the same control variables: (1) with PE Dummy only, (2) additionally including the average PE ranking and stake held in the company as well as the duration of the investment (years before IPO the PE investment was made), (3) including a dummy for tech-venture and bubble-venture deals, (4) including additional corporate governance control variables, (4) testing the RoA at the end of the PE's share lock-up periods and (5) observing only PE deals, replacing the Private Equity Dummy with a dummy variable indicating whether or not the PE deal was a venture or buyout deal

	Abnormal Returns				
Model Specifications	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
Private Equity Dummy	0.205674*	-0.0973994	-0.3636957		-0.1136288
	[0.058]	[0.749]	[0.395]		[0.736]
Private Equity Firm Ranking		0.0030103	0.0010888		0.0011477
		[0.422]	[0.760]		[0.746]
Percent Private Equity Stake		-0.0367386	-0.136505		-0.1971009
		[0.839]	[0.595]		[0.503]
Length of PE Investm. $_{\text{IPO Date}}$		-0.0000158	-0.000107		-0.0000998
		[0.893]	[0.395]		[0.461]
Tech Venture Dummy		0.0383972	-0.0186099		-0.0161107
		[0.840]	[0.922]		[0.932]
Bubble Venture Dummy		0.1545834	0.2339074		0.1473025
		[0.752]	[0.315]		[0.749]
Number of Outside Board Members			0.0465921		0.0409163
			[0.408]		[0.474]
Audit Committee			0.0783735		0.1079833
			[0.699]		[0.593]
Number of Inst. Investors Pre-IPO			0.0233322		0.0250836
			[0.240]		[0.187]
Directors as Shareholders + Stock Program for Directors			0.0653968		0.0634058
			[0.689]		[0.712]
Underwriter Ranking	0.2993679	0.9756464	0.9455795		1.064945
	[0.466]	[0.266]	[0.277]		[0.220]
Placement Volume (log)	-0.0554148	-0.1344683	-0.1129004		-0.123172
	[0.355]	[0.170]	[0.225]		[0.203]
Bookbuilding Price Span	-0.0408164	-0.0085991	-0.0019899		0.0012033
	[0.748]	[0.757]	[0.948]		[0.970]
Number of Underwriters	0.0064886	0.0292248	-0.0070431		-0.0128496
	[0.378]	[0.562]	[0.864]		[0.805]
IPO Company Age $_{\text{IPO Date}}$	0.0134316	0.0006567	-0.0008096		-0.0007485
	[0.504]	[0.610]	[0.662]		[0.689]
Total Revenues $_{\text{IPO Date}}$ (log)	-0.00001***	-0.0106698	0.0055747		0.0027291
	[0.000]	[0.839]	[0.909]		[0.956]
Interest Exp. Debt $_{\text{IPO Date}}$	0.0229797	1.88E-06	1.39E-06		1.44E-06
	[0.546]	[0.392]	[0.661]		[0.610]
CAPEX $_{\text{IPO Date}}$	1.64E-07	-2.32E-06*	-1.96E-06		-1.90E-06
	[0.599]	[0.076]	[0.144]		[0.167]
# of Employees $_{\text{IPO Date}}$	3.47E-08	-7.83E-06*	-6.23E-06		-6.41E-06
	[0.772]	[0.060]	[0.142]		[0.132]
GDP Germany	6.83E-08	-0.0290288***	-0.0257886***		-0.0276787***
	[0.654]	[0.007]	[0.013]		[0.016]
DAX End-of-Day	-2.45E-06	0.0004774***	0.0004801***		0.0004943***
	[0.626]	[0.000]	[0.000]		[0.000]
New Economy Dummy	-0.01665***	-2.226226**	-2.089753**		-2.099087*
	[0.000]	[0.028]	[0.023]		[0.058]
Number of Observations	247	247	247		247
R-Squared (Adjusted)	0.150	0.239	0.245		0.243

Table 13: OLS Regression Results – New Economy (year 2000) only

The presented table displays the results of multivariate OLS regression analyses for a subsample consisting only of IPOs in the year 2000. We test the full set of variables, including all major explanatory and control variables. As dependent variables, we use the four balance sheet performance indicators as well as the two stock performance indicators. All dependent variables here are taken from the year after the IPO date: during the New Economy Bubble, German law ruled for a mandatory lock-up period of 6 months after the IPO for all shareholders before the IPO.

			Models	
Model Specifications	**RoA**	**RoS**	**CFOA**	**CFOS**
Private Equity Dummy	-0.242289**	-26.03521***	-0.0748377***	-4.732448***
	[0.011]	[0.003]	[0.009]	[0.000]
Private Equity Firm Ranking	-0.00058***	-0.2894895***	-0.0004666***	-0.055603***
	[0.000]	[0.000]	[0.000]	[0.000]
Percent Private Equity Stake	-0.32747***	-34.94357***	-0.0014389***	-7.396615***
	[0.000]	[0.000]	[0.000]	[0.000]
Length of PE Investm. $_{\text{IPO Date}}$	0.000023***	0.0011705***	0.000039***	0.0000849***
	[0.000]	[0.000]	[0.000]	[0.000]
Tech Venture Dummy	-0.075114**	5.000051***	-0.1038437***	0.7100729***
	[0.019]	[0.000]	[0.000]	[0.001]
Number of Outside Board Members	0.0038933	-3.77314	-0.0014673	-0.6829708
	[0.860]	[0.273]	[0.936]	[0.264]
Audit Committee	0.05325	0.030421	0.1045234	0.094324
	[0.624]	[0.428]	[0.890]	[0.593]
Number of Inst. Investors Pre-IPO	-0.007773**	0.1123758***	-0.0069857*	0.2015576*
	[0.042]	[0.002]	[0.067]	[0.096]
Directors as Shareholders + Stock Program for Directors	0.537788***	40.65503***	0.3338988***	7.599948*
	[0.000]	[0.003]	[0.003]	[0.074]
Underwriter Ranking	-2.401467*	257.9026	-0.1754987	43.63256
	[0.060]	[0.177]	[0.821]	[0.206]
Placement Volume (log)	-0.0446553	-10.94667	-0.0115648	-2.379079
	[0.249]	[0.104]	[0.778]	[0.052]
Bookbuilding Price Span	-0.011594	-3.206434	0.005919	-0.3895656
	[0.600]	[0.284]	[0.808]	[0.424]
Number of Underwriters	-0.0283266	5.01157	-0.0198258	0.5932626
	[0.440]	[0.269]	[0.450]	[0.450]
IPO Company Age $_{\text{IPO Date}}$	-0.00324***	-0.334502**	-0.0001172***	-0.0736103**
	[0.006]	[0.036]	[0.000]	[0.022]
Total Revenues $_{\text{IPO Date}}$ (log)	0.0520268	9.82561*	0.0006541	2.247308**
	[0.018]	[0.055]	[0.977]	[0.012]
Interest Exp. Debt $_{\text{IPO Date}}$	0.0000168	-0.0011534	0.0000149	-0.0001322
	[0.133]	[0.308]	[0.106]	[0.510]
CAPEX $_{\text{IPO Date}}$	1.33E-06**	-0.0000391	8.65E-07**	-8.71E-06
	[0.019]	[0.438]	[0.039]	[0.408]
# of Employees $_{\text{IPO Date}}$	6.61E-07	-0.0003823	3.99E-07	-0.0000682
	[0.600]	[0.110]	[0.770]	[0.102]
GDP Germany	-0.0141654	2.861857	-0.0089663	0.5969642
	[0.409]	[0.239]	[0.659]	[0.173]
DAX End-of-Day	-0.000242*	0.0275881	-0.0001213	-0.0056246*
	[0.052]	[0.153]	[0.278]	[0.097]
Number of Observations	58	58	58	58
R-Squared (Adjusted)	0.604	0.572	0.343	0.633

Table 14: Difference-in-Difference Regression Results

The presented table displays the dynamic panel regression model using GMM estimators and including a difference-in-difference term. We test each of the four main balance sheet performance indicators as dependent variables. For each variable, we use two specifications regarding the included variables. The control variables are the same as in the main OLS regression model displayed in Tables 7-11. We include time dummies and report the Sargan-Hansen Test. Values in parentheses are p values.

	Return on Assets		**Return on Sales**		**Cash Flow on Assets**		**Cash Flow on Sales**	
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
Diffs-in-Diffs Indicators								
Private Equity Dummy	-.7924161***	-.5696981	-4.642084**	-5.893121**	-.1406228***	-.0446935***	-1.21419**	-1.458843**
	[0.006]	[0.090]	[0.035]	[0.019]	[0.007]	[0.003]	[0.041]	[0.046]
Post-IPO Dummy	-.1449821	.1295266	-.2488609	-.9813799	-.0341964	.0567287	-.1546898	-.2648096
	[0.564]	[0.703]	[0.742]	[0.331]	[0.606]	[0.500]	[0.453]	[0.392]
Interaction Term	-.6619237***	.3920864	-2.961613***	-3.730702**	-.0056938**	-.0853635**	-.4215892***	-.537751**
	[0.002]	[0.361]	[0.006]	[0.024]	[0.041]	[0.033]	[0.002]	[0.023]
Private Equity Control Factors								
Private Equity Ranking	.0014817	.0011102	-.0191049***	-.0205173***	-.0002205***	-.0000978***	-.0024999***	-.00268***
	[0.601]	[0.700]	[0.002]	[0.004]	[0.000]	[0.001]	[0.006]	[0.001]
Percent Private Equity Stake	.4466342	.3903777	4.201104***	-4.673161***	-.1358617***	-.1335379***	-1.228558***	-1.403661**
	[0.020]	[0.106]	[0.005]	[0.002]	[0.000]	[0.006]	[0.004]	[0.019]
Length PE Investment								
Corporate Governance Control Factors								
Number of Outside Board Members	-	.0026223	-	.1196623	-	.0043603	-	.0302986
		[0.860]		[0.196]		[0.507]		[0.398]
Audit Committee	-	.1667796	-	-1.000665	-	-.0246092	-	-.2574656
		[0.157]		[0.394]		[0.818]		[0.515]
Number of Inst. Investors Pre-IPO	-	-.0475775**	-	-.1236467***	-	-.0206041**	-	-.0674586**
		[0.011]		[0.002]		[0.012]		[0.016]
Directors as Shareholders + Stock Program for Directors	-	.0608319***	-	1.228128**	-	.0334393***	-	.356394***
		[0.002]		[0.025]		[0.005]		[0.003]
Control Variables								
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPO/Company Specific Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	1235	1235	1235	1235	1235	1235	1235	1235
Sargan-Hansen Test	0.845	1.000	0.445	0.632	0.900	0.985	0.400	0.543

Table 15: Difference-in-Difference Regression Results – Buyout vs. Venture Deals

The presented table displays the dynamic panel regression model using GMM estimators and including a difference-in-difference term. We use the venture dummy as main explanatory variable, testing the differences between buyout and venture deals over time. control variables are the same as in the main OLS regression model displayed in Tables 7-11. We include time dummies and report the Sargan-Hansen Test. Values in parentheses are p values.

	Return on Assets		**Return on Sales**		**Cash Flow on Assets**		**Cash Flow on Sales**	
	(1)	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**	**(1)**	**(2)**
Diffs-in-Diffs Indicators								
Venture Dummy	-.3912612***	-.8647335***	-1.732428***	-.9058998***	-.2460781***	-.109634***	-.6458767**	-.8229465**
	[0.000]	[0.003]	[0.006]	[0.008]	[0.000]	[0.005]	[0.016]	[0.012]
Post-IPO Dummy	.3804415	3.643852	2.25331*	2.592614	-.0077619	-.0130451	.240793	.3631641
	[0.160]	[0.420]	[0.057]	[0.101]	[0.806]	[0.608]	[0.424]	[0.353]
Interaction Term	-.453462***	-.542135***	-3.032452***	-2.95422***	-.0145332***	-.1035232***	-.543262***	-.762432***
	[0.000]	[0.001]	[0.003]	[0.004]	[0.000]	[0.000]	[0.003]	[0.009]
Private Equity Control Factors								
Private Equity Ranking	-.0000404	-.0059419	-.0281017	-.0333834	-.0008779	.0001589	-.0054774	-.0069191
	[0.989]	[0.303]	[0.407]	[0.305]	[0.513]	[0.860]	[0.344]	[0.453]
Percent Private Equity Stake	.1080396	-.9743352	2.674071	1.787135	-.0796122	.1134378	.662416	.7160797
	[0.680]	[0.327]	[0.345]	[0.372]	[0.123]	[0.187]	[0.349]	[0.218]
Length PE Investment								
Corporate Governance Control Factors								
Number of Outside Board Members	-	-.0689331*	-	-.021236	-	.0020803	-	-.0040858
		[0.057]		[0.846]		[0.729]		[0.905]
Audit Committee	-	-.0613426	-	-1.363045	-	-.0416133	-	-.3777543
		[0.716]		[0.249]		[0.681]		[0.305]
Number of Inst. Investors Pre-IPO	-	-.0641313**	-	-.0631349**	-	-.0166302**	-	-.0483938*
		[0.045]		[0.040]		[0.034]		[0.052]
Directors as Shareholders + Stock Program for Directors	-	0.905432***	-	1.52435***	-	0.034523***	-	0.424652***
		[0.000]		[0.000]		[0.000]		[0.000]
Control Variables								
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
IPO/Company Specific Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Observations	550	550	550	550	550	550	550	550
Sargan-Hansen Test	0.424	0.632	0.532	0.914	1.000	0.945	0.500	0.854

Table 16: Private Equity Ranking

The presented table displays the ranking of Private Equity firms included in the deals of our dataset. We rank the firms by number of IPOs, the average ownership stake the companies took in the portfolio companies and the firms' age. All three indicators serve as proxies for the proficiency of the companies: the oldest PE firm which took part in the most number of IPOs in Germany and acquired the largest shares in these companies is therefore regarded as the highest ranked firm according to our ranking methodology. We display each firms' age, number of IPOs and the average stake the firms took in the portfolio companies (average and percentile).

Rank	Private Equity Firm	Age	Number of IPOs	Average Stake in IPO'd companies in %	Controlling Stake in Portfolio Company in %
1	3i Group plc	65	20	21.19	10<x<25
2	Gold-Zack AG	14	6	14.75	10<x<25
3	DEWB AG	13	5	33.16	30<x<50
4	TVM Capital GmbH	27	5	14.23	10<x<25
5	Kohlberg Kravis Roberts Co. L.P.	34	3	78.39	>50
6	Earlybird Venture Capital GmbH & Co. KG	13	3	27.02	30<x<50
7	BdW GmbH & Co. KG	41	3	18.98	10<x<25
8	Apax Partners, L.P.	41	3	15.50	10<x<25
9	Bayerische Beteiligungsgesellschaft mbH	38	3	18.65	10<x<25
10	KDV AG	26	3	8.30	<10
11	Deutsche Beteiligungs AG	45	2	50.49	>50
12	Ventizz Capital Partners Advisory AG	10	2	79.72	>50
13	Glasauer Wagniskapital KGaA	16	2	32.79	30<x<50
14	DG Private Equity GmbH	11	2	26.71	30<x<50
15	Technostart GmbH	19	2	11.70	10<x<25
16	TFG Capital AG	16	2	20.43	10<x<25
17	MPM L.P.	14	2	22.03	10<x<25
18	VCG Venture Capital Gesellschaft mbH	12	2	16.50	10<x<25
19	IKB Beteiligungsgesellschaft mbH	23	2	4.50	<10
20	BW-Kapitalbeteiligung GmbH	20	2	3.23	<10
21	NORD Holding Unternehmensbet. GmbH	17	2	4.45	<10
22	Bmp AG	15	2	2.48	<10
23	IBB Beteiligungsgesellschaft mbH	13	2	3.33	<10
24	Warburg Pincus LLC.	44	1	58.43	>50
25	General Atlantic LLC	30	1	50.46	>50
26	Quadriga Capital Beteiligungsberatung GmbH	25	1	69.30	>50
27	Permira Beteiligungsberatung GmbH	25	1	54.70	>50
28	BC Partners Limited	24	1	51.00	>50
29	Halder Beteiligungsberatung GmbH	22	1	55.20	>50
30	EQT Funds Management Limited	16	1	52.04	>50
31	Lindsay Goldberg & Bessemer L.P.	9	1	100	>50
32	Arques Industries AG	8	1	100	>50
33	Baker Capital	15	1	46.30	30<x<50
34	Advanced European Technologies N.V.	15	1	28.30	30<x<50
35	T-Telematik Venture Holding GmbH	13	1	39.15	30<x<50
36	IVC Venture Capital AG	12	1	33.67	30<x<50
37	1&1 Beteiligungen GmbH & Co. KG	12	1	27.58	30<x<50
38	Patrio Plus AG	11	1	38.91	30<x<50
39	HVB Beteiligungsgesellschaft mbH	5	1	30.22	30<x<50
40	WestKB-Kapitalbeteiligungsgesellschaft mbH	41	1	13.00	10<x<25
41	Süd-Kapital-Beteiligungsgesellschaft mbH	41	1	22.35	10<x<25
42	Wellington Partners GmbH	19	1	18.44	10<x<25
43	VCM Capital Management GmbH	19	1	10.34	10<x<25
44	SAM Sustainable Asset Management AG	15	1	14.30	10<x<25
45	Trangan Beteiligungs GmbH	13	1	23.47	10<x<25

Table 17: Underwriter Ranking

The presented table displays the ranking of all underwriting banks included in our sample. We ranked the banks according to their market share they hold in the German IPO market. The market share is calculated by the total EUR-denominated volume of IPOs (in terms of placement volume) in the German market over the period 2000-2007. We thus regard the bank with the highest market share as the most proficient underwriting bank. We display the number of IPOs as well as the total IPO volume plus the resulting market share for each bank.

Rank	Underwriting Bank	Number of IPOs	Total Volumes of IPOs in EUR	Market Share of IPO Market in Germany in %
1	Deutsche Bank	25	17,609,237,196	40.79%
2	Dresdner Kleinwort	18	5,581,233,200	12.93%
3	Morgan Stanley	10	3,881,409,395	8.99%
4	Commerzbank	20	2,173,074,937	5.03%
5	UBS	9	2,166,057,553	5.02%
6	Goldman Sachs	5	1,325,327,139	3.07%
7	DZ Bank	23	1,207,022,276	2.80%
8	Credit Suisse	7	1,080,191,545	2.50%
9	Bayerische Hypo- und Vereinsbank	14	904,515,827	2.10%
10	Westdeutsche Landesbank	7	672,724,400	1.56%
11	Sal. Oppenheim	12	598,773,222	1.39%
12	UniCredit	5	510,526,530	1.18%
13	JP Morgan	4	463,288,333	1.07%
14	BNP Paribas	4	438,027,357	1.01%
15	Lehman Brothers	4	388,242,363	0.90%
16	Robertson Stephens Intern ational	3	329,417,500	0.76%
17	Baden-Württembergische Bank	7	314,513,819	0.73%
18	HSBC	7	305,142,880	0.71%
19	Landesbank Baden-Wuerttemberg	7	295,090,594	0.68%
20	Cazenove	3	251,143,227	0.58%
21	Merrill Lynch	1	242,250,000	0.56%
22	ABN Amro	2	228,850,000	0.53%
23	Bank Vontobel	2	223,134,868	0.52%
24	Schroders	3	212,624,236	0.49%
25	Gontard & Metallbank	9	208,967,573	0.48%
26	Salomon Smith Barney	2	183,698,868	0.43%
27	Concord	5	174,722,105	0.40%
28	Citigroup	1	156,621,978	0.36%
29	BHF Bank	5	137,740,000	0.32%
30	Vereins- und Westbank	1	98,600,000	0.23%
31	M.M. Warburg	3	96,094,240	0.22%
32	VEM AG	7	93,125,000	0.22%
33	Equinet	2	90,100,450	0.21%
34	Norddeutsche Landesbank	3	69,491,952	0.16%
35	Hamburgische Landesbank	1	62,700,000	0.15%
36	Viscardi	1	55,020,250	0.13%
37	Berliner Effektenbank	3	43,090,000	0.10%
38	WGZ Bank	3	38,675,000	0.09%
39	Trogon	1	36,500,000	0.08%
40	Quirin Bank	1	34,000,000	0.08%
41	Merck Finck	1	33,637,500	0.08%
42	Bayerische Landesbank	1	24,000,000	0.06%
43	Consors	2	23,730,000	0.05%
44	Baader Bank	1	22,475,000	0.05%
45	Kling Jelko Wertpapierhandelsbank	2	22,005,000	0.05%