Investment Rationales of Hedge Funds and Private Equity Funds in the German Stock Market

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Abstract

This paper analyzes the investment strategies of hedge funds (HF) and private equity funds (PE) in public equity markets. We provide empirical evidence for substantial differences in their investment strategies. HF are driven by the following motives: (i) they seem to aim at dividend increases and thereby address agency problems associated with free cash flow, (ii) they appear to align incentives by investing in firms whose ownership structure is not conducive to good monitoring and whose management is likely to be entrenched, (iii) they invest in firms in which the free cash flow is maneuverable due to high R&D expenditures and (iv) HF are intensely involved in mergers and acquisitions and may operate as corporate control agents or merger arbitrageurs. PE strategies are characterized as follows: (i) with stable cash flows, low growth prospects and little R&D, PE targets have low expected financial distress costs and are thus well-suited for increases in leverage; (ii) PE invest in firms which are likely to exhibit agency costs due to low managerial equity and, hence, a large degree of ownership-control separation; (iii) they seem to invest in firms with rather concentrated ownership in order to reach irrevocable commitments. Hence, our findings indicate, that HF buy minority stakes in order to implement measures which mitigate agency problems and hence create wealth in the *short run* or in order to benefit from merger arbitrage. PE buy controlling stakes in companies in order to mitigate agency problems and hence create wealth in the *long run*.

1   Introduction

Hedge funds (HF) and private equity funds (PE)[1], both belonging to the alternative investment class, increasingly receive media and academic attention in public equity markets. Anecdotal evidence suggests that they gain influence on managers and interfere with corporate policy. Prominent cases include, for example, The Childrens' Investment Fund (TCI) pressuring Deutsche Börse to cancel its planned acquisition of the London Stock Exchange and enforcing the resignation of former CEO Werner Seifert, or the well-known case of KKR investing in RJR Nabisco, one of the largest PE transactions. However, the following characteristics suggest that they follow distinct investment motives: (i) HF and PE substantially differ with respect to investment horizon: money in PE funds is locked up for an average period of 10 years (Sahlman (1990)), whereas money in HF is invested for only about 10 months (Agarwal et al. (2009)). (ii) This difference is also reflected in the incentive structures for fund managers: PE managers' compensation is based on the final cash flow generated over the term of the fund, while HF managers are compensated based on a periodical marking to market of their portfolios. (iii) PE are specialized in equity investments, whereas these investments only represent a small fraction of HF activities. Given that both investors have distinct business models but act on the same playground, it remains an empirical question whether PE and HF follow similar or different investment strategies in public equity markets.

The answer to this question matters for several interest groups. Hostile investors in the form of HF or PE have become key concerns on top managements' agendas. Because these investor types have the reputation of becoming involved in corporate decisions, managers are skeptical of HF and PE and try to prevent their entries. Furthermore, the understanding of HF and PE motives is important to other investors with exposure to (potential) target firms as this enables them to evaluate whether HF and PE have positive or negative consequences on shareholder value. Similarly, debtholders may also be affected by HF or PE because shareholder value maximization may come to be at the expense of the value of debt securities. Finally, this research problem is relevant for policy design. The political debate in Germany and in part also in Europe at large is critical of HF and PE. The debate perceives the high profit orientation and alleged short-termism of those investors to impair long-term prospects of target firms and in particular the interests of employees. An understanding of the drivers of HF and PE investment choices is crucial in order to evaluate whether their activities are socially desirable or not and whether potential policy measures should address them jointly or separately.

Previous empirical studies reveal a positive role of HF and PE by finding a link between their investment decision and the motive of agency cost reduction (e.g. for HF Clifford (2007), Brav et al. (2008), Klein and Zur (2009) and for PE e.g. Opler and Titman (1993), Halpern et al. (1999), Renneboog et al. (2007) or Weir et al. (2005b)). Agency problems arise from the ownership-control separation: in the presence of inefficient control mechanisms, managers have the discretion to pursue

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[1]We speak of PE in the narrow sense, i.e. later stage investments. The wide sense of PE includes both early stage (i.e. venture capital) and later stage investments (Kaserer et. al (2007)).

their private interests which potentially are at the shareholders' expense. HF and PE possess the abilities and face the incentives to monitor managers. Do they really create wealth or do they merely transfer wealth from other stakeholders such as debtholders and employees?

Based on a sample of 96 HF entries and 57 PE entries in German firms between 1998 and 2007, we study the HF and PE investment behavior by analyzing the characteristics of target firms using binomial logistic regressions. The purpose of the study is twofold: (i) the identification of systematic target characteristics with the intention of enhancing the understanding of potential sources of value creation and (ii) the discrimination between HF and PE investment styles. We analyze firm character-istics which are likely to be associated with the potential drivers. Our analysis focuses on monitoring and agency cost reduction as the main value drivers of interest. The analysis is restricted to the major intersection of both players, i.e. investments in publicly listed firms. Furthermore, the empirical study is limited to the ex-ante target characteristics and does not include the consequences of the involvement of financial investors such as share price developments or changes in the firms' financials or operations.

The present paper links the literature on LBOs and PE with that of HF shareholder activism. It contributes to the existing work in two primary respects: (i) the study analyzes the interplay of HF and PE investments with the distinct features of the German corporate governance system such as concentrated ownership structure, importance of family ownership and conflicts between small and large shareholders; (ii) the study directly compares the characteristics of HF and PE investments.

The study of the motives of HF and PE is particularly interesting with respect to Germany. Like many Central European countries, it exhibits a corporate governance system that differs from the Anglo-Saxon model: weaker protection of minority shareholders (la Porta et al. (1999)), reduced exposure of managers to hostile takeovers (Franks and Mayer (1998), Loderer and Peyer (2002)) and high degree of ownership concentration (Andres (2008)). The first two characteristics imply the potential for investors to pursue governance improvement strategies.[2] The third characteristic suggests that due to more concentrated ownership structures, agency conflicts might be dominated by conflicts that do not exist between shareholders and managers but between large and small shareholders. In this case, the investment might be motivated by the intention to discipline large shareholders that extract private benefits. Until the late 1990s, ownership structures in Germany were largely characterized by cross-holdings among major German firms, with banks and insurance companies in the center of the shareholding network. This system - referred to under the term "Deutschland AG" - was criticized of impairing effective corporate governance control. Before the unbundling, corporate control was mainly exerted by banks and other corporations via supervisory board representation. The start of activities of HF and PE in the German equity market followed shortly after the unbundling of Deutschland AG was initiated in the late 1990s. This observation might not be coincidental but may be explained by HF and PE aiming at the profitable exploitation of the control vacuum which was generated by the unbundling.

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[2]E.g. Croci (2007) investigates the market reaction to the entries of active investors ("corporate raiders") in Conti-nental Europe.

In terms of the empirical method employed, the present paper is closely related to Opler and Titman (1993) and Halpern et al. (1999). The authors model the likelihood of a leveraged buyout (LBO) as a function of firm characteristics that are linked to information asymmetry and agency costs. Opler and Titman (1993) find that a combination of low growth prospects and high cash flows, low expected financial distress costs as proxied by R&D and a high degree of diversification positively affect the odds of a firm to become subject to an LBO. Based on a similar approach, Halpern et al. (1999) come to the conclusion that the LBO decision is driven by greater prior acquisition interest, poor prior stock performance, little use of debt and low managerial equity. We extend their approach by introducing an additional shareholder – HF – into the analysis as well as firm characteristics which potentially discriminate among HF and PE.

There are several other studies which investigate differences among alternative investors. Dai (2007) compares the activity of HF and venture capital funds in the issuance of new shares which are privately placed by listed firms in the U.S. – so called PIPEs (private investment in public equity). He comes to the conclusion that venture capital funds source value from reducing information asymmetry, whereas the HF gains can only be attributed to arbitrage: as the new shares are offered at a discount, HF can profit from quickly reselling the shares in the market at a premium. As opposed to the U.S., the German PIPE market is very small and data availability is greatly limited.[3] Furthermore, by concentrating on growth firms, Dai's (2007) research design is suited to study the role of certification rather than monitoring.

Klein and Zur (2009) analyze confrontational investments of HF and other private investors. They find that HF acquire stakes in firms that are likely to exhibit agency costs stemming from free cash flow. Other private investors appear to effect changes in the firms' investment strategies. The "other private investor" category consists of PE, individuals, venture capital firms and asset management firms. PE only constitute a small fraction of this group and their investment strategies are likely to be fundamentally different from those of the other types. In addition, their analysis does not include LBOs. As a consequence, Klein and Zur's (2009) study is not specifically designed to analyze differences between HF and PE.

Our empirical results suggest that due to their substantially different business models, HF and PE follow distinct investment strategies when acting on the same playground. HF almost always acquire minority stakes. Their investment decisions are positively associated with the degree of ownership fragmentation. This may be either explained by liquidity considerations that are positively linked to free float or by the fact that they reduce agency costs in firms that exhibit control deficits due to high ownership fragmentation. Moreover, we find evidence that HF invest in firms in which managers are likely to be entrenched as measured by above-average CEO tenures. HF targets are likely to exhibit dividend potential which could be interpreted as HF trying to reduce agency problems associated with free cash flow. As the cash flow in R&D intensive firms is highly maneuverable, HF appear to aim at

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[3] PIPE transactions have to be filed with the SEC which strongly facilitates the analysis of PIPEs in the U.S. market.

cutting R&D investments and thereby creating shareholder value in the short run. In addition, the HF investment calculus is strongly related to M&A activties. This may indicate that they act as corporate control agents by preventing inefficient mergers or inducing value enhancing ones. Alternatively, the involvement with M&A activities could be attributed to speculative motives.

PE acquire controlling stakes in their targets. They invest in firms with a likely potential of interest alignment between managers and shareholders as indicated by low managerial equity. They often purchase stakes from large shareholders, in particular families, and hence function as an exit channel. Buying from large shareholders is likely motivated by maximizing the deal success probability and minimizing the acquisition premium. PE targets are particularly well-suited for leverage increases because they exhibit stable cash flows, low growth prospects and little R&D which indicate low expected financial distress costs. The rationale for leverage increase may be motivated by reducing agency costs associated with free cash flow, tax arbitrage or diversification considerations. Both types of investors seem to intend to profit from corporate governance improvements, but they differ in the means of reaching these goals. Due to their distinct business models HF predominantly implement measures which create value in a short period of time, whereas PE effectuate changes which potentially create wealth in the long run.

The remainder of the paper is organized as follows: section 2 characterizes the distinct business models of HF and PE and reviews previous literature. We argue that they are expected to solve agency problems as opposed to traditional financial investors. Based on these results, section 3 develops hypotheses about the typical target characteristics of HF and PE. Section 4 describes the empirical design chosen to address the research question. We explain the empirical design and briefly comment on summary statistics. Subsequently, the empirical results are presented and interpreted in section 5. Section 6 concludes.

2 Comparison of business models and previous empirical evidence

There are several commonalities between HF and PE. Both are privately organized investment firms equipped with large capital resources and employing professional fund managers to maximize investment returns. They are both part of the alternative investment class which is to be distinguished from traditional institutional investors such as asset management firms. Their direct client base - as opposed to traditional institutional investors - exclusively consists of sophisticated investors. As a consequence, they are exempt from several regulatory obligations which usually apply to investment firms. HF and PE are, for instance, allowed to strongly link up fund managers' compensation to investment performance. Typically, fund managers' shares in their own investment success amounts to 20% of the fund's annualized returns (Cliord (2007)). Moreover, due to the reduced degree of regulation, they are allowed to make heavy use of debt nancing. This can enhance returns and increase effec-

tive ownership. Previous empirical evidence indicates that traditional asset managers fail in trying to profit from agency cost reduction (e.g. Gilian and Starks (2007). The higher flexibility resulting from the characteristics in terms of incentives for fund managers and leverage might enable HF and PE to pursue investment strategies that are not open to traditional shareholders. Against this background, being an active shareholder might be a profitable strategy for HF and PE but not for traditional funds.

There are substantial dierences in the business models of HFs and PE (see Table 1 for a summary). HF engage in a variety of asset classes such as commodities, options, futures or foreign exchange of which activities related to publicly listed firms only represent one among numerous strategies; in contrast to that PE focus their investment activities on equity investments. This difference is then also reflected in the personnel pool from which both types recruit their investment professionals. While HF mainly recruit employees with financial markets expertise (e.g. from proprietary trading), PE additionally recruit personnel with substantial operational expertise, e.g. former management consultants and industrial top managers (Cressy et al. (2007)). These differences in the degree of equity specialization suggest that PE are likely to have superior abilities in understanding and evaluating the target's business and identifying potential levers to improve shareholder value.

One of the most striking differences is the time horizon of the two types of funds linked up to their organizational set-ups. After their initial investment in HF, investors have to wait for an average of ten months before they can withdraw their capital. After this lock-up period, investors have to wait for abother four months on average until they can take back their invested funds (Agarwal et al. (2009)). HF performance is evaluated on a marking to market basis. The fees are determined according to the net asset value of the fund periodically, mostly on an annual basis. This implies a relatively short investment horizon and a preference for liquid securities such that the value can easily be determined from observing market prices. Moreover HF investors cannot withdraw capital on an immediate basis like in the case of mutual funds, for instance. Instead, there are regular redemption dates at which clients can withdraw capital from the fund. As a consequence, HF prefer holding positions which can be liquidated quickly and at low cost.

In contrast to HF, which in principle have an infinite life, PE funds are set up for a finite period of on average ten years (Sahlman (1990)). During this time, the existing investors cannot withdraw their capital and the fund is closed to new investors. This condition is likely to commit PE to maximize the fund value over a long horizon. Unlike HF, the fund's value is not evaluated on a periodical basis, but at the end of the holding period, i.e. when all investments are realized. Investors cannot withdraw their capital before the final liquidation of the fund. As a consequence, PE are relatively patient investors and able and willing to hold illiquid assets.

These organizational differences are likely to be a key determinant of the investment strategies with respect to public equity. Shareholder value engineering via agency cost reduction, operational improvement and capital structure optimization are measures which require a sufficiently long investment horizon and operational expertise. These requirements are rather met by PE than HF. HF

should only be able to increase the value of their investment by incremental changes which can be implemented over a short horizon. However, more recently the redemption rules of HF have changed (Bevilacqua (2007)): with the establishment of longer lock-up periods, "side pockets" and "gates", HF have developed means to pursue strategies which involve the investment in illiquid assets.[4] It is an empirical question whether this evolution systematically applies to HF and allows them to mimic investment strategies typically pursued by PE.[5]

Previous empirical findings on HF and PE indicate that they successfully act as corporate control agents and, hence, create shareholder value. The phenomenon of shareholder activism by HF was initially observed in the U.S. in the early 1990s, and there exists a substantial body of empirical work.[6] This literature characterizes the activist strategies, their impact on stock returns in the short and long run, target characteristics and fundamental changes in the firms subsequent to HF entries (see Table 2 for an overview).

Empirical findings suggest that HF usually do not acquire controlling blocks but minority stakes (e.g. Brav et al. (2008)). This is in line with their short investment horizon as it allows them to exit their investments quickly and at low cost. In order to gain influence over targets, HF typically make use of shareholder rights such as requesting board seats or proxy fights. They also use informal ways of attaining influence by using the media and publicly articulating their demands (Bessler and Holler (2008)). These informal ways are probably gaining more relevance in the German market. Due to their small share of voting rights, HF have to rely on the cooperation or passive support of other shareholders in order to achieve their goals. Typical requests include opposing or supporting a merger, sale of assets, increasing dividends, share buybacks or replacing the CEO.[7] Several U.S. studies document large success rates (approximately 60%) of HF achieving their initially stated goals (Klein and Zur (2009), Clifford (2007)).

The market unambiguously appreciates the involvement of HF – upon the announcement of HF entries, share prices rise significantly (Brav et al. (2008), Clifford (2007), Klein and Zur (2009), Boyson and Mooradian (2007), Bessler and Holler (2008), Greenwood and Schor (2007)). But what constitutes this effect is less clear. Clifford (2007) analyzes passive and active HF investments in U.S. equity. He argues that there are two explanations for the observation of positive excess returns around

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[4] Longer lock-up periods increase the investment horizon of the fund. Cost of liquidity receives less weight as it presents a fixed cost which can then be distributed over a longer time horizon. Side pockets and gates work into the same direction: side pockets present a certain fraction of invested capital that can be invested in illiquid securities as it cannot be redeemed and is not taken into account for the determination of the net asset value. Gates present a cap for the percentage amount of capital that can be withdrawn by the clients of the fund.

[5] So far, the establishment of lock-up periods has been observed with individual HF of high reputation. It is questionable, whether this development is representative to the entire HF industry.

[6] In addition to attention by economics, also legal scholars are interested in shareholder activism by HF. They analyze the organizational features which enable them to pursue activist strategies, the legal means (proxy fights) which they employ and raise concerns regarding certain dangers, e.g. empty voting (e.g. Kahan and Rock (2007) or Partnoy and Thomas (2006).

[7] According to U.S. regulation, all investors which purchase a stake or more than 5% in a public firm, have to make a 13D filing with the SEC. In this filing, they must report whether they are passive or active investors and in the latter case the goals of activism have to be made explicit. This regulatory requirement facilitates the analysis of activist HF strategies in the U.S.. In Germany, such regulation is to come in place as part of the Risikobegrenzungsgesetz (Risk Limitation Act).

the announcement date of an HF entry: they can proxy for anticipated value increases due to agency cost reduction or reflect the fact that the market attributes superior stock picking abilities to HF. Several studies document that HF targets have sound operating profits, large cash holdings, small dividend payments and low growth opportunities (Brav et al. (2008), Klein and Zur (2009), Boyson and Mooradian (2007)).[8] Subsequent to HF entries, dividend payments and leverage are increased whereas cash holdings are reduced. The authors come to the conclusion, that the stated goals of activism concern general (payout, management change, stop acquisition, push for takeover) rather than firm-specific issues (in particular operations). Greenwood and Schor (2007) sketch a less optimistic picture of HF as corporate governance advocates and argue that they are primarily undertaking merger arbitrage. Clifford (2007) argues that if HF strategies are restricted to stock picking, then the stated goals should not matter for abnormal returns which they do according to the empirical results.

To our best knowledge, there is only one empirical paper studying HF activism for the German market. Bessler and Holler (2008) study short and long-term returns subsequent to HF entries in Germany. They find abnormal returns to be significantly larger for high reputation HF and small firms. Hence, their empirical results are consistent with both the monitoring and certification hypothesis. Empirical evidence is provided by HF targets exhibiting the same characteristics as likely takeover candidates, namely: poor prior stock performance, small size and less analyst coverage. Long-term returns are largely driven by whether the firm has been ultimately acquired or not. The authors conclude that HF have superior skills in identifying undervalued assets and speculating in mergers and acquisitions rather than being effective monitors in the long run. In summary, previous evidence in the U.S. and Germany indicates that HF follow various strategies when purchasing blocks in public equity: they invest in undervalued firms, they act as corporate control agents in mergers and acquisitions and they aim at reducing agency costs.

There are numerous studies on PE in the U.S., fewer in Continental Europe and in particular Germany. In the following, we will introduce the main findings of a selection of PE literature (see Table 3 for a short summary). Generally, three approaches are followed in order to identify sources of value creation: the cross-section of market reactions to the announcement of PE entries, the cross-section of premia paid and target characteristics. Lehn and Poulsen (1989) analyze going private transactions in the U.S. and find that the likelihood of being taken private positively depends on free cash flow, prior takeover interest and is inversely related to sales growth. The premia paid to existing shareholders are driven by large cash holdings and low managerial equity. The authors conclude that PE align incentives between managers and shareholders and reduce agency costs associated with free cash flow. Andres et al. (2007) study the market reactions to LBO announcements in Continental Europe. They find that the abnormal returns are driven by free float, managerial inefficiency and undervaluation. On a country level, their findings suggest that abnormal returns are inversely related to the protection of minority shareholders. Apparently, PE are able to resolve monitoring deficits. Opler and Titman's (1993)

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[8]In contrast to their results, Clifford (2007) does not find indications for agency costs associated with free cash flow.

LBO study finds that the combination of high cash and low growth prospects drives the takeover likelihood. High amounts of free cash seem to cause agency problems in firms which do not have attractive investment opportunities, as the danger of managers spending cash on inefficient projects is more pronounced. Under the assumption that a leverage increase represents an important instrument in order to realize the gains from the transactions, firms with high expected financial distress costs are unlikely targets. Their empirical findings are consistent with this assumptions: the expected costs of financial distress of targets are low as proxied for by R&D spending or selling expenditures. In addition, Halpern et al. (1999) find that LBO likelihood increases with poor prior stock performance. This result suggests that PE target firms are inefficiently managed or suffer from undervaluation by the market. In the former case they aim at reducing agency costs and in the latter PE intend to draw value from reducing information asymmetries and hence take over a certification function. This result is also replicated in the study of Renneboog et al. (2007) on UK transactions. The studies of Weir et al. (2005a), Weir et al. (2005b) and Weir et al. (2008) provide further evidence on UK transactions. Weir et al. (2005a) and Weir et al. (2005b) find that going private targets are more likely to suffer from undervaluation by the market and are likely to have inefficient internal governance mechanisms. Similar to Opler and Titman (1993), Weir et al. (2008) analyze the role of financial distress costs with respect to the going private decision in the UK. According to their findings, UK targets exhibit a high asset collateralization and are more diversified. Tax arbitrage is a potential further motive for the leverage increase. Increasing the firm's leverage leads to a reduction of tax payments as interest payments on debt are tax deductible (Opler and Titman (1993)). Under the tax arbitrage hypothesis, PE profits are driven by wealth transfer from the government to PE rather than by wealth creation. A further source of value creation, which falls under the "arbitrage" category, is saving the costs associated with being publicly listed. It is argued that PE take firms private in which the listing costs exceed the listing benefits (Weir et al. (2005b)).[9] Savings potential is likely to be more pronounced for mature firms that have few growth prospects and stable cash flows. For such firms, listing benefits such as enhanced access to capital market funding or reputation are less relevant (Renneboog et al. (2007)).

To our best knowledge, there is only one study analyzing PE investments in the German stock market. Achleitner et al. (2008a) perform an event study on the announcement of PE investments in German firms from 1998 − 2007. According to their findings, the market reaction is driven by undervaluation, low actual use of leverage and the size of tax payments.

Summing up, both HF and PE are flexible investment firms with high incentives for investment managers. These properties permit them to monitor their targets' managers and draw value from the reduction of agency costs. The fact that there are fundamental differences between their business models and, in particular, their investment horizons implies that the sources of value creation are also likely to differ between them.

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[9]Listing costs are for instance caused by compliance with regulatory requirements or frequent communication with the market.

3 Hypotheses

In the following section, we develop testable hypotheses about likely characteristics of HF and PE targets. The hypotheses are based on previous findings with respect to HF and PE, general theoretical and empirical work in the area of corporate governance as well as anecdotal evidence. The goal of the empirical test of the hypotheses is to discriminate between the potential sources of value creation by HF and PE. Table 4 summarizes the hypotheses, details on variables employed for testing as well as the expected signs. Definitions and sources of the variables employed are to be found in Tables 5 and 6.

3.1 Prior stock performance

Poor prior stock performance may be linked to both the monitoring and the certification hypotheses (Andres et al. (2007)). If capital markets are assumed to be semi-strong form efficient[10] and, hence, market participants correctly assess the equity value of the firm, poor prior stock performance may indicate managerial inefficiency. The management is not able to conduct profitable investment projects and, being aware of this, the market participants revise their valuation downwards which causes the share price to underperform. The anticipated value decrease may stem from managers extracting private benefits or simply from bad management quality. With respect to both cases, the existing shareholders are failing to discipline or replace managers. As hypothesized in the section above, both HF and PE are potentially able to create the required incentives for managers.

Relaxing the efficient capital markets hypothesis, poor prior stock performance can serve as a measure of undervaluation due to lack of market visibility. In this case, observing poor prior stock performance supports the certification hypothesis. Weir et al. (2005a) argue that undervaluation impairs the firm's access to funding via public markets. The entry of a financial investor makes market participants become aware of the undervaluation and, hence, they may update their beliefs about the firm's value. HF and PE usually have a powerful network in the financial community (e.g. with investment banks, mutual funds, insurance companies) which enhances their potential certification role.

H1 (performance): Both HF and PE targets exhibit poor prior stock performance.

Performance is measured as the last share price 20 days before the entry divided by the average share price in the preceding 250 trading days. In order to adjust for economy-wide influences, this measure is then divided by the equivalent measure of the CDAX index. In this way we measure whether and to which extent the stock has underperformed or overperformed in the past. This measure cannot distinguish between the certification and monitoring hypotheses. Other measures, e.g. operating profitability, may provide further hints with respect to the questions of whether the firm suffers from poor management or poor market visibility.

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[10]We refer to semi-strong form efficiency according to Fama (1970): the stock price incorporates all publicly available information about the firm's value.

3.2 Free cash flow

According to the free cash flow theory (Jensen (1986)), firms with excess cash positions are likely to exhibit agency problems. It is argued that cash richness creates opportunities for inefficient investment behavior. Managers can use readily available resources to pursue their own interests rather than that of their shareholders. Instead of piling up cash, managers should return excess resources to shareholders via share buybacks, regular or special dividends, if high liquidity is not needed for expansion investments. Agency costs stemming from free cash flow are most likely to occur in mature and stable businesses with few growth opportunities. If a mature firm needs additional liquid resources, it should address debt or equity markets which would then scrutinize the project's efficiency. HF and PE can create value by resolving excess cash positions and thereby reducing agency costs stemming from financial slack.

H2 (cash): HF and PE targets have large cash holdings.

Dividends mitigate agency costs arising from financial slack because they present a means by which cash from operations is returned to shareholders on a regular basis. With respect to the U.S., there is empirical evidence of HF appealing for dividend increases (Brav et al. (2008)). This strategy is in line with the assumed HF monitoring strategy of quickly implementable agency cost reduction.

H3 (dividend yield): HF targets have a low dividend yield.

Jensen (1986) argues that debt financing presents another instrument for committing managers not to waste cash on potentially inefficient investment projects. Taking on additional debt reduces financial slack as managers are bound to use cash from operations to redeem the debt. According to this view, debt financing is more binding than dividends, as those can be cut more easily than the cancellation of debt contracts. Thus, firms with unused debt capacity offer disciplinary potential. Margaritis and Psillaki (2007) offer empirical support for the hypothesis that leverage can serve as a disciplinary tool to mitigate agency costs of outside ownership and lead to an improvement of efficiency.

Compared to a dividend increase, an increase in leverage is more complex, requires more industry insight and a longer time horizon. As a consequence, PE are more likely to induce a financial turnaround compared to HF. Furthermore, Ivashina and Kovner (2008) find that PE negotiate more favorable loan terms for their targets which facilitates a leverage increase. They offer two explanations for this finding: (i) PE may reduce information asymmetry from the perspective of banks and (ii) banks may find it attractive to offer PE improved financing terms in order to cross-sell other fee business.

H4 (debt): PE targets feature low levels of debt.[11]

Increasing leverage may be attractive for alternative reasons: tax benefits and risk diversification.

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[11] The odds of becoming a PE target should be inversely linked to the use of the firm's leverage potential. As Halpern et al. (1999) remark, the direct measurement of debt capacity is very difficult and hence we have to rely on the *actual use* of debt as a proxy. If a firm has excess cash, the amount of total debt is a poor proxy for the use of leverage, as the cash could be used to redeem part of the outstanding liabilities. Hence, we also include a net debt measure for robustness.

Opler and Titman (1993) point out that PE face the criticism of making profits from tax arbitrage (Loewenstein (1985)). By means of increasing leverage, they reduce taxes and thereby increase shareholder value. According to Opler and Titman (1993), leverage is increased beyond the point at which taxes are fully eliminated. The authors conclude that tax arbitrage does not suffice to be the only driver of PE investment decisions. To control for the possibility of a tax-driven motivation, we include tax liabilities as a control variable. Risk diversification represents another motivation behind leverage increases. Reducing the size of the equity stake in the firm increases the number of projects that could be financed by a given amount of funding. Increasing leverage presents one way of reducing the equity stake in targets and hence enables PE to diversify the risk of their investment projects.

Jensen (1986) argues that the problems associated with free cash flows are more pronounced in firms that do not have attractive growth opportunities. Growing firms need liquid resources for investments which is why they have to turn to equity and debt markets on a regular basis. Requesting new capital entails a monitoring mechanism, as the investors will scrutinize the investment project prior to the supply of capital. As a consequence, large cash positions in growing firms are less likely to create managerial discretion. High growth opportunities are also related to information asymmetries (Clarke and Shastri (2001)). A mature firm with stable cash flows embodies less risk, as a substantial part of its profit potential has already materialized. The value of a high-growth firm largely consists of the anticipation of future profits. Hence, debt financing is more easily obtainable for stable and mature firms, as they have more collateralizable assets (Opler and Titman (1993), Weir et al. (2008)). We hypothesize that PE prefer to invest in firms with poor growth prospects. Firms with attractive growth prospects are difficult to turn around both from an operational and a financial perspective.

H5 (q): PE target firms with low Tobin's q.

In order to avoid the misclassification of high cash-high growth firms as being prone to financial slack, we include several interaction terms: (i) DEBT1 is defined as debt multiplied by q, (ii) DIV1 is defined as dividend yield divided by q.

Research and development activities (R&D) represent a potential further proxy for the debt capacity of a firm. Opler and Titman (1993) argue that R&D expenditures proxy for the uniqueness of a firm's products. In case of bankruptcy, R&D investments, e.g. laboratory equipment or product ideas, are difficult to liquidate, as these assets are often highly firm-specific or intangible. As a result, these R&D assets can usually only be sold at a large discount. Due to the high expected financial distress costs, a firm with high R&D activities will have a fairly limited debt capacity and thus presents a less likely PE target. We thus include R&D as an alternative proxy for the firm's debt capacity. R&D can also serve a different role with respect to the investment calculus. The cash flow in R&D intensive firms is highly sensitive with respect to R&D. An increase in free cash flow caused by reductions in R&D could lead to higher shareholder value.

3.3   Incentive alignment

Shareholder size and identity are the main determinants of monitoring incentives (e.g. Shleifer and Vishny (1986), Grossman and Hart (1980) or Gorton and Kahl (1999)). The lower the shareholders' incentives to monitor, the more likely will the firm exhibit agency problems. Hence, a firm with a shareholding structure that fails to create monitoring incentives exhibits a greater incentive alignment potential and is in general more likely to be involved with an active investor. Managerial ownership is recognized as an important mechanism to align the interests of owners and managers (Kennedy and Limmak (1996) or Nikoskelainen and Wright (2007)). Empirical evidence documents the success of managerial ownership in reducing agency costs (e.g. Beiner et al. (2006)). Therefore, the potential to reduce agency costs is likely to be limited in the presence of high managerial ownership.

H7 (management): HF and PE targets have low managerial shareholdings.

Family ownership presents a distinct feature of the German equity landscape. This phenomenon is less prevalent in Anglo-Saxon markets. There is empirical evidence that family owners are successful in dealing with agency conflicts (Andres (2007)). This can be explained by families usually holding a large fraction of their wealth invested in the firm. This large and non-diversified exposure generates high monitoring incentives. Furthermore, families are generally invested over a long time horizon. The knowledge and expertise regarding the firm's operations as well as the reputation which they have built up with other shareholders positively affects their ability to effectively monitor managers.[12]

H8 (family): HF and PE targets have little family-ownership.

3.4   Ownership concentration

Ownership concentration represents a typical feature of the German equity market. This characteristic may be related to investment decisions of HF and PE in at least two ways: transaction feasibility and private benefits.

The PE business model suggests that PE acquire large, controlling stakes. The creation of irrevocable commitments of existing shareholders to sell their stakes to PE could substantially increase the success probability of the transaction and reduce acquisition costs. Irrevocable commitments denote undertakings of existing shareholders to tender their shares to the bidder. Increasing the success probability matters because the danger of a failed transaction is costly (Wright et al. (2007)). First, in case of failure the costs of planning and initiating the transaction will be sunk. Second, PE usually need debt financing for their transactions. Irrevocable commitments substantially increase the likelihood that PE acquire more than 75% of shares outstanding. In this case, PE can to set up a control and profit transfer agreement according to §291 of the German Securities Act. Such an agreement may improve the creditworthiness of the transaction and thus reduce financing costs.

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[12]There are also arguments for a negative impact of family shareholders: families are likely to have interests that are not necessarily shared by other shareholders such as concerns about the firm's image or reputation and debt aversion (Dyer and Whetten (2006) or Mishra and McConaughy (1999)).

These commitments are more likely to be established in the presence of concentrated ownership. Grossman and Hart (1980) provide theoretical support for this hypothesis. In their model, small investors face a free-riding situation when they consider tendering their shares to a corporate raider that bids to acquire the firm. Because these small investors are non-pivotal in the takeover bid, they prefer to wait for an improved bid before tendering their shares. The model implies that in the presence of dispersed ownership, the bidder has to pay a larger acquisition premium. As a result, buying from existing large shareholders can reduce the acquisition premium.

H8a (free float): PE prefer targets with concentrated ownership.

However, ownership concentration might have different implications for the investment calculus of HF. According to their business model, they do not aim at the acquisition of controlling stakes which is why reaching irrevocable commitments of existing shareholders is not important for them. Furthermore, they have a strong preference for liquid investments. The size of free float is generally acknowledged to be positively associated with the stock's liquidity (Weill (2005) for a theoretical argument and Chan et al. (2004) for empirical evidence). Therefore, transaction costs of trading are expected to decrease with increasing free float. Moreover, dispersed ownership is generally expected to be inversely related to monitoring efficiency. Shleifer and Vishny (1986) argue that dispersed ownership may produce a free-riding situation with respect to investments in monitoring technologies. A shareholder undertaking monitoring activities bears the entire costs while all other shareholders profit for free. Furthermore, the business model of HF suggests that they primarily acquire small stakes. Gaining influence over managers and corporate policy only represents an attractive investment strategy for HF if small stakes coincide with high marginal control. This is expected to be the case in the presence of dispersed ownership as measured by large free float.

H8b (free float): HF prefer targets with large free float.

In the U.S., agency problems are claimed to arise predominantly because of dispersed ownership and thereby few monitoring incentives. But due to the high degree of ownership concentration, the more relevant conflict in Germany is said not to arise between managers and shareholders but between large and small shareholders (Gugler and Yurtoglu (2003)). Large shareholders can extract private benefits at the expense of the wealth of minority shareholders. Private benefits are defined as the extraction of more than proportional rents relative to the size of cash flow rights.

We argue that PE rather avoid investment in firms that exhibit the potential for private benefits. Admittedly, they could be able to discipline a dominant shareholder that extracts private benefits at the expense of minority shareholders. However, they are in principle able to discipline the largest shareholder, but this is expected to be unprofitable. If PE aim at buying a controlling stake, the dominant shareholder that extracts private benefits will only tender his stake to PE if the offer price compensates him for the loss of private benefits. As a consequence, buying out shareholders that are extracting private benefits is unattractive for PE under the assumption that they aim at controlling stakes.

H9a (PB): PE target firms do not exhibit the potential for private benefits extraction.

In contrast, the reduction of private benefits could represent a profitable strategy for HF. Under the assumption that they do not aim at controlling stakes, they do not have to pay off shareholders that extract private benefits, but can build up a counter-stake and thus discipline the dominant shareholder that extracts private benefits. The case of TUI and Wyser-Pratte is an example of a collusion between the management (CEO Frenzel) and strategic investors (Riu, Mordaschow and El Chiaty). This case could be interpreted as a situation in which HF enter a firm in order to reduce the private benefits of the largest shareholder and commit managers to focus on shareholder value creation instead.

H9b (PB): HF targets exhibit private benefits potential.

In order to test the above hypotheses, we need to empirically disentangle the degree of ownership concentration and private benefits. In general, these variables should be correlated to a certain degree, as the potential for private benefits extraction presupposes the existence of a dominant shareholder which is positively associated with ownership concentration.

For the empirical test of the private benefits hypothesis, several authors (e.g. Achleitner et al. (2008a) or Gugler and Yurtoglu (2003)) employ the size of the second largest shareholder. The size of the second largest shareholder is considered a proxy for his power and his ability to prevent the largest shareholder from extracting private benefits. A more comprehensive measure should account for the *difference* in power between the largest and the second largest shareholder and thus reflect an interaction between the two variables. Gugler and Yurtoglu (2003) propose the following measure: if the second largest shareholder owns less than 5% of shares, they label this firm as "unchecked", meaning that there is no other powerful shareholder which can reduce the private benefits extraction of the largest shareholder. The authors suggest that the private benefits potential is even greater if there is a controlling shareholder (i.e. a shareholder who owns more than 25%) and the firm is unchecked. In line with these authors, we construct the following dummy variable. PB is set equal to 1 if there is a controlling shareholder and the second largest stake is smaller than 5%. As robustness checks, we additionally include continuous variables to test for the potential power of the largest shareholder to extract private rents: we use the ratio of the largest to the second largest stake as well as their difference.

3.5 CEO tenure

Agency costs may be positively related to the length of time the CEO is in office (Hill and Phan (1991), Geldes and Vinod (2002)). This has mainly two reasons: first, the length of employment per se is a potential *cause* of agency costs. As the time increases during which a CEO is in office, he gains more power to pursue his own instead of the shareholders' interests: he learns more and more about the firm's information system and thereby learns how to manipulate communication, e.g. by withholding unfavorable information about his performance. Furthermore, over a long time horizon, the CEO can build strong relationships with supervisory board members in repeated interactions. By having the

ability to win the supervisory board's loyalty, the CEO may be able to sidestep critical inspection of his quality and reduce the probability of getting replaced. Second, an excessively long employment period may be a *symptom* of agency problems. The CEO still being in office despite persistent poor performance can serve as a proxy for weak governance mechanisms.

Requesting a change in top management can be implemented in relatively short time as compared to an operational turnaround, for instance. Hence, it is hypothesized that HF pursue a strategy of increasing shareholder value by requesting a management change. Anecdotal evidence for this strategy is found in the cases of TCI's investment in Deutsche Börse or Wyser-Pratte's investment in TUI. In both cases, HF explicitly criticize that the CEO has been in office too long and has not been committed to increasing shareholder value.

H10 (tenure): HF targets are likely to exhibit long CEO tenure.

H11 (CEO1): HF targets are likely to exhibit long CEO tenures after poor prior stock performance.

We do not expect a significant relationship between CEO tenure and PE targets. There are neither anecdotal nor academic hints at PE limiting their agenda to firing the CEO.

3.6 Mergers and acquisitions

There is anecdotal evidence that HF pursue corporate control-driven strategies in mergers and acquisitions (e.g. TCI and Deutsche Börse). Both the monitoring and the arbitrage hypotheses suggest that HF investments are linked to mergers and acquisitions activity. The tendency of management to acquire new assets can be motivated by empire-building preferences. There is empirical evidence that a substantial part of mergers actually destroys value (e.g. Cording et al. (2002)). Hodkinson and Partington (2007) find support for management hubris with respect to takeovers, i.e. managers overestimate the value of synergies generated by the takeover and pay too much for the acquisition. If a firm plans an acquisition which is not likely to maximize shareholder value, an activist investor can create value by preventing the takeover. Klein and Zur (2009) document empirical support for HF as corporate control agents: after the announcement of HF opposing a merger, the market reacts with significant positive abnormal returns. In addition, HF can create value in the reverse case, i.e. if the company is a takeover target and the management tries to prevent being taken over motivated by keeping their job. Klein and Zur (2009) also document significant positive market reactions if HF declare the goal of merging the firm with another company. Moreover, Greenwood and Schor (2007) find that HF targets are more likely to be acquired within the year following the HF entries compared to a matched sample. According to the authors, there are two possible explanations: either HF are successful corporate control agents or they have superior skills in identifying likely takeover targets. Both strategies are consistent with the short HF horizon. Empirically, it is difficult to distinguish between these cases.[13]

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[13]Klein and Zur (2009) circumvent this problem, as mandatory SEC filings enable them to exclusively focus on events in which HF clearly state that the aim is to actively interfere with pending mergers and acquisitions.

H12 (acquisition): HF target firms with acquisition plans.

H13 (target): HF invest in takeover targets.

Having a relatively long investment horizon, PE firms are less likely to be interested in event-driven strategies. Hence, we expect that there is no significant relationship between PE targets and pending mergers and acquisitions.

4   Empirical design and descriptive statistics

4.1   Methodology and dataset construction

The main goal of the empirical analysis is to develop an understanding of how target characteristics affect the odds of a firm becoming involved with HF or PE. The standard technique used for takeover prediction is binomial logistic regression analysis. This model tests the direction and the extent to which firm characteristics affect the likelihood of a firm becoming a target.[14] For the construction of the control group there is the choice between two sampling procedures: random sampling and matched sampling. There are good reasons for and against the use of a matched sample. Several authors argue in favor of matching because financial ratios like leverage, operating profitability or investment volume largely differ across industries, size categories or growth perspectives. Against this background, matching can make the control group more comparable to the target group (Song and Walkling (1993)). There are also compelling arguments against the use of matching (Halpern et al. (1999)). First, industry membership, size and growth opportunities are variables of interest for our purposes. By using matching it would not be possible to see whether these characteristics make a difference for the odds to become a target. Second, there are inaccuracies in the definition of an industry (Clarke (1989)) – it is questionable whether industry membership is a meaningful measure. Consequently, industry-matching may not necessarily result in obtaining a comparable control sample. In addition, there are two pragmatic reasons for the use of a random rather than a matched control sample: as the German equity market is relatively small compared to the U.S. market, the number of comparable firms is also relatively small and for some targets it would therefore be difficult to obtain a good match. Moreover, because the distribution of targets and non-targets across industries is similar in the present sample (see Table 7) – the concern regarding overrepresentation of one industry does not apply to the present case. Empirical evidence (e.g. Song and Walkling (1993)) does not find that matching significantly changes the test results. Overall, the literature has not come to a final conclusion of whether matching is superior or not from a methodological perspective. In this paper, a random control sample is employed.

As suggested by Halpern et al. (1999), we use a temporal matching procedure in order to account

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[14]The use of binomial models in takeover prediction entails methdological flaws which cause an overestimation of the takeover probability (Palepu (1986), Kieschnick (1998), Powell (2007)). The present analysis is not affected by these flaws, as the binomial model is not used for prediction but merely for testing the significance for factors influencing the investment choice.

for economy-wide influences. Temporal matching is implemented as follows: we randomly select announcement dates from the target samples in order to determine the dates for the collection of control sample data. As a result, the distribution of control firms over time broadly resembles that of target firms (see Table 8).

The dataset underlying the present empirical analysis comprises 96 HF targets, 57 PE targets and 96 non-targets serving as control firms. The HF sample has been collected from a database provided by the Bundesanstalt für Finanzdienstleistungsaufsicht (BaFin), the German Financial Supervisory Authority. The database comprises all reported shareholdings according to § 21 of the German Securities Trading Act. According to § 21, an institution or person has to report his shareholding to BaFin and the issuer if it exceeds or falls below certain threshold values of 3%, 5%, 10%, 25%, 50% or 75%. BaFin and the issuing firm then publicize this information. The database lists the underlying share, the reporting date of the transaction, the identity of the shareholder, his location of incorporation and the fraction of shares held after the respective transaction. The BaFin database includes the name of the investor but no information about his type, i.e. whether the reporting institution is an HF, mutual fund, industrial firm, individual etc. Hence, further work is required in order to identify those HF that acquire visible stakes in publicly listed firms. The fact that there is no legal definition of an HF further complicates the identification of HF investments. We proceed as follows: the entire database is screened for reporting institutions that are neither individuals nor industrial firms nor banks or insurance companies. Each remaining reporting institution is then checked for being an HF using Factiva, LexisNexis, Google and investor magazines. In order to qualify as HF, the institution has to fulfill one of the following criteria: (i) being classified as HF in the financial press or an investor magazine or (ii) defining themselves as HF on their webpage. Several traditional asset managers like UBS have set up funds whose investment strategies resemble those of HF, e.g. by the use of derivatives. It is not possible to distinguish whether the financial institution holds the equity stake as part of their HF or traditional business. We exclude those ambiguous cases. Furthermore, only the first entries of HF into a firm are included in the sample. The relevant entry dates have been cross-checked with the financial press as BaFin reports usually entail a considerable time lag.

The PE sample is collected with the help of the Merger Market database. Among other transactions, Merger Market provides information on PE investing in German equity. Targets in the financial sector were excluded from both the HF and PE sample for the following reasons: (i) financial statements are difficult to be compared to the statements of industrial firms and (ii) there may be other motivations for these investments like strategic co-operations with the targets.

96 control firms were randomly selected from CDAX firms excluding all HF and PE targets as well as financial firms. Firm data for the control sample was chosen from the entry years of the targets in order to avoid biases due to potential macro-wide influences particular to a certain year. The exact dates were randomly chosen from the target sample. In order to avoid a potential survivorship bias, we randomly chose firms from the CDAX list of the respective year. Accounting information on the

firm level refers to the figures in the fiscal year before the announcement of investor entry.

4.2 Summary statistics

PE started to become involved with German publicly listed firms in 1998 (see Table 7). 2005 exhibits the highest number of entries with 13 investments. HF assumed their German activities with a lag: the first HF investment detectable by the sample selection procedure described below was observed in 2001. Nearly 90% of all the entries were observed between 2005 and 2007, with a peak of 40% of all HF events in 2007. This difference in distribution over time requires temporal matching as discussed in the methodology section. In the U.S., there was a PE as early as the 1980s. HF investments in the U.S. have been observed since the mid-1990s. The time lag with respect to Germany can be first attributed to the fact that most HF and PE are U.S.-based firms and test their strategies in their domestic market before competition makes them expand internationally. Second, authors like Bessler and Holler (2008) argue that the German market became more attractive for foreign investors due to the 'unbundling of the Deutschland AG'. It was argued that the complex cross-shareholdings and the mutual control of supervisory boards among German corporations impaired effective corporate governance control. Discussions in the late 1990s on the need for action resulted in the enactment of a new law which allows corporations to sell their equity stakes in other firms tax-exempt. Following the new tax rule, many key players in the center of Deutschland AG such as Deutsche Bank AG, Allianz AG or Münchener Rück AG committed to sell their numerous equity stakes. The coincidence of the unbundling and the start of HF and PE activities could be interpreted as the unbundling generating the potential for investment strategies aimed at the improvement of corporate governance.

In 2007, there were only three publicly announced PE transactions, all of which occured in the first half of the year. This could be traced to the subprime crisis which started in mid-2007 and made it difficult to obtain debt financing at attractive terms.

Table 8 shows the distribution of target and non-target firms across industries. Overall, the distribution across industries exhibits weak patterns, but there is no clear overrepresentation of one or more industries. HF investments are most commonly observed in the following industries: industrial, software and media. The most common sectors of PE targets are consumer goods, industrials and software. There are noticeable differences between HF and PE in the following industries: pharma & healthcare (rather preferred by HF) and consumer goods (rather preferred by PE). This difference may reflect the general preference of PE to invest in stable businesses that exhibit a low degree of uncertainty. The distribution of the financial investor targets grossly resembles the industry distribution of the firms randomly selected from CDAX.

HF and PE targets significantly differ with respect to the size of the acquired stakes (see Table 9). PE hold much more concentrated positions relative to HF when looking at the euro volume of the stakes. Consistent with the statement in section 2, HF investors almost always (95.8%) acquire minority stakes. We can only observe three cases in which HF acquire a controlling stake, i.e. a stake in

excess of 25%. All HF stakes remain below the threshold of 30% which triggers a mandatory takeover offer according to § 29 and § 35 of the German Securities Acquisition and Takeover Act. In contrast, PE acquire controlling stakes in 91.2% of the events. 80.7% of the stakes are above the mandatory takeover threshold of 30%. In more than half of the cases, PE acquire more than 75%. This finding is consistent with the initial assumptions that PE aim at full control whereas HF intend to induce only small changes. The threshold of 75% is relevant under the assumption that PE aim at increasing leverage, because it enables PE to set up a control and profit transfer agreement according to § 291 of the German Securities Act which is likely improve the financing terms for the transaction. Nearly half of the PE targets in our sample have been delisted subsequent to PE entry. With respect to HF, the delisted targets only account for 10% of the sample.

Table 10 exhibits the source from which HF and PE respectively purchase the initial stake. In all cases, HF buy shares in the market, whereas PE purchase the shares from existing large blockholders such as families (31.5%), institutional investors (22.8%) and other industrial firms (21.1%) and only in 22.8% of the cases from the market. This observation supports our hypothesis that PE investors - in aiming at full control over the target - try to create irrevocable commitments in order to increase the success probability of the deal and reduce acquisition costs.

Tables 11, 12 and 13 summarize the descriptive statistics of target and non-target firms. The univariate results suggest that HF targets differ significantly from PE targets. The ownership structure summary statistics suggest that HF target firms with large free float. This may be due to marginal control of their small stakes being higher with increasing free float and also their preference for holding liquid positions which can be sold quickly and at low cost. Large positions could not be exited as easily since they would usually cause a considerable price impact. As opposed to the evidence on the U.S. market (Klein and Zur (2009)), we do not find any support for the hypothesis that target size is particularly small in comparison to randomly selected CDAX firms. However, only 14% of PE targets and 19.8% of HF targets are members of the HDAX. HDAX membership is expected to be positively related to market visibility and accordingly inversely with information asymmetry. In terms of the market value of equity, HF targets are significantly larger than PE targets, but in terms of sales, the HF targets are smaller. This finding can be attributed to the observation that HF invest in companies with greater growth prospects, whereas PE target mature firms as measured by Tobin's q. Further support for this explanation is provided by the firm age variable (HF targets are significantly younger than PE targets) and years of listing (HF targets have been listed for shorter times compared to PE targets). As a consequence, it seems to be advisable to include interaction terms between growth prospects and variables for the free cash flow hypothesis. On average, both HF and PE do not seem to target distressed firms suffering from poor operational performance. The differences to the control samples in terms of ROA are nonnegative and in the case of HF this difference is statistically significant at the 10% level.

5 Empirical results

The following section presents the output of the binomial logistic regressions. We discuss the extent to which the initially stated hypotheses are supported or rejected by empirical data. Table 15 shows the results of the logistic regression with respect to HF targets and non-targets, Table 16 presents the equivalent results for the comparison of PE targets and non-targets. The reported models are not subject to the problem of multicollinearity. The variance inflation factors of the independent variables in all reported models are well below the rule-of-thumb threshold of 10. A maximum variance inflation factor of VIF = 1.52 is obtained for the explanatory variable "size" as measured by the natural logarithm of sales for model 4 in the PE versus control section.[15]

5.1 Hedge fund targets versus non-targets

The results in Table 15 do not yield any evidence that HF invest in firms that suffer from poor prior stock performance. Under the efficient market hypothesis, a poor prior stock performance would indicate managerial inefficiency. Thus, in terms of prior stock performance, HF do not seem to seek an operational turnaround of unprofitable firms. This view is also consistent with the observation that HF targets do not suffer from poor operating performance as measured by ROA. We do not find indications for HF investing in undervalued firms as measured by poor prior stock performance under relaxation of the efficient market assumption. Size is generally acknowledged as a proxy for information asymmetry (Frankel and Li (2004)). Small firms receive less attention by capital markets (e.g. Renneboog et al. (2007)). In particular, small firms are less interesting investment objects for traditional institutional investors because of the existence of minimum investment sizes for these investors. As a consequence, there is little trading activity in the shares of small firms which decreases the information content of the share price. Testing size as a proxy for information asymmetry, we cannot find any evidence that HF target small firms. The strategy of investment in undervalued securities due to information asymmetry does not seem to be a representative investment motive of HF.

Family ownership is inversely related to the likelihood of becoming an HF target. Empirical evidence in Germany (Andres (2008)) suggests that families successfully solve agency conflicts. As a consequence, the negative impact of family ownership on HF investment can be interpreted as support for the incentive alignment hypothesis. With respect to management ownership the empirical results do not establish a significant effect on the odds of becoming an HF target. The management coefficient is negative but fails to be statistically significant. Model 5 includes free float as a control variable. The statistical significance at the 10% level for the positive coefficient shows that HF prefer to invest in firms with large free float, which may be due to higher liquidity and higher marginal control. In additional regressions, we also find that controlling owners are significantly less present in HF targets.

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[15] Table 17 shows the logit analysis which compares HF to PE targets. The interpretation of this table is omitted, as the empirical results do not yield an additional contribution that goes beyond the two separate analyses of HF versus non-targets and PE versus non-targets.

This finding is also in line with the assumption that HF only assume a monitoring function if there is little control over the management in place.

HF eschew firms with potential private benefits issues: PB has a negative coefficient with statistical significance at the 1% level in all seven models. This finding is robust with respect to the use of various alternative proxies and provides clear evidence that HF do not aim at the reduction of private benefits problems. First, they only buy small stakes and do not build up a sufficiently large stake to control or outvote the dominating shareholder. Second, the PB variable is negatively correlated with free float (see Table 14). Hence, the HF preference for free float is another explanation for HF avoiding firms with a disposition for private benefits problems.

We do find other support for the hypothesis that HF aim at reducing agency costs stemming from free cash flow. The dividend yield is inversely related to the odds of becoming an HF target: in all models, the negative coefficient is significant at least at the 5% level. Apparently, HF targets exhibit dividend potential. This can be interpreted as support for the hypothesis that HF push to raise dividends. The observation of a low dividend yield could be attributed to the construction of the measure: HF invest in growth firms and, as the market value of equity is in the denominator of the dividend yield measure, the measure is very small. Table 13 shows that the retention rate of HF targets is significantly larger for HF targets. The retention variable measures the degree to which operating profits are kept within the firm as opposed to being distributed to shareholders. By its construction, the measure is not based on the market value of equity (see Table 6). This observation suggests that the dividend yield finding cannot only be ascribed to the use of a growth related measure which could bias the dividend yield variable. But it may also be suggested that there is a negative relationship between dividend payout and HF targets because growth firms per se do not pay out much and rather prefer to reinvest the cash from operations into the expansion of their businesses. If this were the case, then the conclusion that HF aim at pushing for dividend increases would be inappropriate. DIV1 adjusts dividend payments to growth prospects, as it is defined as dividend yield divided by Tobin's q. Model 4 tests this measure and shows that having a low q-adjusted dividend yield significantly increases the odds of becoming an HF target. Hence, the caveat above is not compelling with respect to our results.

Buybacks present an alternative to return cash. The results above might be subject to the omitted variable bias: if HF targets are of such a type as to prefer buybacks over dividends, it would be inappropriate to classify them as firms with low cash payouts. The summary statistics Table 13 document that this problem does not apply to the HF targets. Even in terms of buybacks, HF targets distribute significantly less cash to shareholders.

We do not find any evidence for the hypothesis that HF aim at investing in firms with the intention of making them pay out excess cash. The insignificance of cash holdings is maintained when testing for several modified cash proxies such as cash scaled by market value, the absolute size of cash and several interaction terms (CASH1, cash only if the firm has poor growth prospects and 0 otherwise).

Accordingly, the prominent case of TCI urging Deutsche Börse to return cash to shareholders does not seem to be representative. Moreover, as can be seen from Table 13, HF targets are not underleveraged compared to control firms. Quite the reverse: the interaction term DEBT1 is significantly larger compared to the control sample (at the 1% level). Hence, HF targets have slightly more debt when adjusting for growth perspectives. The positive and significant coefficient of the R&D measure provides further evidence of HF targets not being likely to have debt capacity under the assumption that R&D is a proxy for expected costs of financial distress. Overall, the claim that HF invest in firms in order to burden them with additional debt is not supported by the empirical results. This observation is consistent with the view that HF do not seek a financial turnaround of the target. The positive influence of R&D on the odds of becoming an HF target appears puzzling. Investors with operational expertise have the ability to evaluate the efficiency of R&D projects. R&D is acknowledged as a proxy for information asymmetry due to the high technical complexity of the firm's business. R&D projects are usually unique and their outcomes highly uncertain. These features make it difficult for market participants to value the firm (Aboody and Lev (2000)). Chan et al. (2001) find empirical support for the claim that the market has difficulties in sufficiently appreciating the value of R&D projects. Investors with operational expertise could invest in undervalued R&D firms and thereby make other market participants aware of the undervaluation. Furthermore, it could be argued that investors that are skilled with respect to R&D could cut inefficient R&D and thereby increase shareholder value. Against the background of HF not being equipped with operational expertise, these investment motives are unlikely. However, there exists an alternative explanation. Free cash flow in R&D firms is highly sensitive to expenditure on R&D. HF could call for cuts in R&D, in order to increase free cash flow which could result in a higher valuation by analysts. This strategy would also be in line with the short investment horizon of HF. Further empirical investigation on the consequences of HF investment is required for a more comprehensive evaluation of the role of R&D. If HF do indeed aim at R&D reduction, shareholder value might be increased in a sustainable way under the assumption that high R&D is related to managerial entrenchment. Alternatively, cuts in R&D could have adverse effects on shareholder value in the long run.

The empirical results show that q significantly increases the odds to become subject to HF investment. Under the assumption that q proxies for information asymmetry, this finding could be consistent with stock picking. However, the fact that HF have little industrial expertise, they are unlikely to have superior abilities in identifying undervalued high growth firms. Furthermore, their short investment horizon should not allow them to be sufficiently patient and wait until the share price has appreciated to the fair value of the firm. Rather, the finding of the significantly positive impact of q could be explained by the fact that there is a strong correlation between q and R&D.

We document weak evidence of the CEO tenure hypothesis: the tenure coefficient is positive and statistically significant at the 10% level in three out of five models. HF seem to target firms in which the CEO has been in office for a relatively long time. Under the assumption that the discretion of the

manager and accordingly his likely degree of entrenchment increases with the length of employment, this result can be interpreted as a further indication of the presence of agency problems in target firms.

The involvement of a firm with mergers and acquisitions significantly affects the odds of becoming an HF target as suggested by the positive and significant coefficients of the acquisition and target variables. It may be argued that this relation is observed because HF invest in firms with attractive growth prospects and the positive relation with *pending* acquisition plans is due to external growth strategies. With respect to the control variable of executed acquisitions in the past two years, HF do not significantly differ from control firms (see Table 13). The pending nature of the acquisitions seems to be the characteristic that makes a difference. This can be interpreted as HF being active in corporate control and investing in the firm because they want to prevent management from a potentially inefficient acquisition. Alternatively, this result suggests that HF speculate on mergers. The same reasoning applies to the finding that being a takeover target significantly increases the likelihood of HF entry. In all seven models, the positive coefficient of the target dummy is statistically significant at the 1% level. From a corporate control perspective, HF can invest in takeover targets in order to make reluctant managers agree to the takeover. Alternatively, they can draw value from speculating on an increased bid. Given the present data, it is not possible to distinguish between the merger arbitrage and the corporate control hypothesis. Furthermore, speculation on an increased bid could also be interpreted as a certification strategy, as the HF may have superior knowledge of the 'fair' takeover price. In order to assess whether HF are passive merger arbitrageurs/certificators or active corporate control agents, one would have to collect additional information about whether HF actively interfere with takeover decisions. The significant impact of acquisition rumors on the HF investment calculus could offer an alternative explanation of the positive role of R&D in becoming an HF target. Over the sampling interval, M&A activity was particularly high in technology and pharmaceutical industries. This is reflected in the positive and significant correlation between acquisition rumors and R&D and can serve as an explanation of the observation of a positive impact of R&D on the HF investment decision.

In a nutshell, HF pursue the following strategies: (i) they seem to aim at dividend increases and thereby address agency problems associated with free cash flow, (ii) they appear to align incentives by investing in firms whose ownership structure does not generate high monitoring incentives and whose management is likely to be entrenched, (iii) they invest in firms in which the free cash flow is maneuverable due to high R&D expenditures and (iv) HF are intensely involved with mergers and acquisitions and may operate as corporate control agents or merger arbitrageurs.

5.2   Private equity targets versus non-targets

Table 16 shows the results that compare the characteristics of PE targets and non-targets. PE do not invest in firms with poor prior stock performance. PE targets also do not seem to exhibit significant information asymmetries as suggested by variables such as size, q or R&D. Quite the reverse, R&D

expenditures are significantly inversely related to the odds of a firm becoming subject to PE investment. Previous studies (e.g. Lichtenberg and Siegel (1990)) document that PE implement higher operational efficiency. PE's superior industry expertise could enable them to evaluate the efficiency of R&D projects. According to the empirical findings of Sorensen et al. (2008), PE increase the efficiency of patents in non-listed companies. However, the negative size of the R&D variable suggests that the motive of cutting R&D expenditures, as part of operational engineering aimed at shareholder value maximization is unlikely. The financial distress aspect that will be discussed in the following paragraph seems to be dominating. In addition, we do not find any evidence that PE invest in distressed firms. In terms of operational profitability as measured by ROA (see Table 13), PE targets are statistically insignificant but slightly more profitable than control firms.

In contrast to other studies (e.g. Opler and Titman (1993)), we do not find that PE targets are cash rich. The cash variable and also interaction terms of cash and growth (not reported here) are insignificant. Furthermore, the empirical results do not document that PE targets are underleveraged. The negative coefficient of the debt variable has the predicted sign but fails to be significant. Either the PE targets do not have unused debt capacity or the proxies are imperfect. In particular, debt capacity and operational cash requirements differ significantly across industries. However, we do find alternative support for the hypothesis that targets feature characteristics which make them attractive for an increase in leverage. Proxies for expected financial distress costs are significantly inversely associated with the odds of PE entry: the coefficients of both R&D and q are negative and significant in most models. In general, PE targets are relatively mature as measured by firm age. As pointed out by Weir et al. (2008), financial distress costs may be inversely related to firm age because old firms face less operating uncertainties compared to young firms. However, in contrast to our empirical results, the UK targets studied by Weir et al. (2008) are younger compared to a matched sample which supports the undervaluation hypothesis rather than the financial distress cost hypothesis. The significant and negative coefficient of risk suggests that PE firms in our sample have stable earnings. The fact that q is inversely linked to the likelihood of becoming a PE target provides additional support for the role of the financial distress cost aspect under the assumption that q can be interpreted as a measure for asset collateralization. A low q may also serve as an indication for the lack of attractive growth opportunities and, hence, for small financing needs and, hence, taking the firms private may create value by eliminating the costs of public listing.

As mentioned previously, PE are accused of primarily profiting from tax arbitrage. Model 6 tests for the significance of the tax variable. The coefficient is opposite to the hypothesized direction and insignificant. This finding is replicated when using tax expenses divided by the market value of equity as an alternative measure. Hence, we do not find any support for PE targets having high tax liabilities. This finding is in line with the results of Weir et al. (2005b) and Weir et al. (2008) who do not find that high tax liabilities significantly increase the likelihood of PE investment in the UK. The value drivers of PE activities in Germany seem to stem from sources other than tax arbitrage. This finding

is not necessarily inconsistent with the results of Achleitner et al. (2008a), who find that the market reaction to PE entries is driven by tax motives: an increased use of a debt tax shield may indeed increase shareholder wealth, but still the tax advantage does not represent an original investment motive. Overall, we find evidence for the potential of target firms to increase the use of debt financing which potentially reduces agency costs associated with free cash flow. Additional support for the hypothesis that PE do in fact serve as monitors can be found by testing the variables that proxy for incentive alignment potential.

The results document support for the hypothesis that PE create value from incentive alignment. PE invest in firms with low prior managerial equity. Apparently, PE aim at aligning interests of managers and shareholders. This finding is consistent with previous empirical evidence, e.g. found by Halpern et al. (1999), Opler and Titman (1993), Lehn and Poulsen (1989). In robustness checks, we control for a potential non-monotonic relationship testing the square of managerial ownership. Several authors (e.g. Morck et al. (1988)) argue that managerial entrenchment can be higher for very large managerial stakes. However, the present results do not establish a significant relationship between the odds of becoming a PE target and the square of managerial shareholdings. Weir et al. (2005b) offer an alternative interpretation for the role of managerial ownership: they interpret their finding that the likelihood of being a target increases with shareholdings of executive directors as support for the incentive effect. A takeover by PE usually generates large financial gains for shareholders. According to the incentive effect, managers with equity stakes have incentives to initiate such a value-generating transactions; in particular if they believe that the firm is undervalued. Further empirical results of Weir et al. (2005b) document additional support for the undervaluation hypothesis: targets are significantly younger, smaller and have poor prior stock performance. We do not find any support for the undervaluation hypothesis in terms of these variables. In contrast to the findings of Weir et al. (2005b) who analyze UK targets the incentive and undervaluation effects do not explain PE investment choices in Germany.

Further support for the incentive alignment hypothesis is found in terms of the founder variable. PE targets are significantly less founder-managed. The identity of founder and manager is likely to reduce problems of separation of ownership and control and hence a lack of this identity may indicate agency costs. In terms of family shareholdings, we do not find evidence that PE avoid firms with low family stakes. The family coefficient is insignificant but positive in all six models in which it is tested. At first glance, this presents a contradiction to the initial hypothesis, as it was assumed that family ownership is negatively related to agency problems. A potential explanation might be the ability of PE to serve as a successor of large shareholders. Based on a survey among PE and family firms, Achleitner et al. (2008b) find that when contemplating an exit, families may prefer selling their stakes to PE because of a higher selling price and the general aversion of families to sell their business to a competitor. This result is also consistent with the hypothesis that PE aim at reaching irrevocable commitments to increase the success probability of the transaction and reduce acquisition costs.

The empirical results suggest that PE entry is rather unlikely in the presence of private benefits. The presence of private benefits rather deters PE entry, as they generally aim at controlling stakes which would require paying off a dominant shareholder who extracts private benefits.

There is no evidence that being a takeover target significantly affects the odds of becoming subject to PE entry. The coefficient of the target variable is positive but statistically insignificant.[16] Furthermore, the likelihood of PE entry is inversely related to pending acquisition plans. The acquisition coefficient is negative and significant in all models. This shows clearly that PE do not invest in firms with the intention to prevent outstanding acquisitions. One possible explanation for the significantly negative coefficient of the acquisition variable is the fact that PE targets are stable and mature firms with poor growth prospects which typically are less active in acquisitions.

In sum, PE strategies are characterized as follows: (i) with stable cash flows, low growth prospects and little R&D, PE targets are particularly well-suited for increases in leverage. (ii) they invest in firms which are likely to exhibit agency costs due to low managerial equity and, hence, large degree of ownership-control separation; (iii) PE seem to invest in firms with rather concentrated ownership in order to reach irrevocable commitments.

6 Concluding remarks

The purpose of the paper was the analysis of HF and PE target characteristics in order to identify and compare their investment strategies and likely sources of value creation. Summing up, the findings indicate that HF and PE pursue distinct investment strategies because of their particular business models.

HF acquire minority stakes in public companies and focus on firms with large free float, lack of controlling shareholders and in particular lack of family ownership. Furthermore, they are likely to draw value from dividend increases or CEO replacement which the existing shareholding structure fails to enforce due to little monitoring incentives. There is strong evidence that hedge funds follow event-driven strategies such as corporate control or merger arbitrage.

In contrast, PE mostly acquire controlling stakes and aim at taking the target private accompanied by an increase in leverage. PE targets are well-suited for leverage increases because they are likely to have low expected financial distress costs. PE function as an exit channel for blockholders such as families, industrial firms or other institutional investors. The PE investment decision is driven by the preference for irrevocable commitments. PE also appear to draw value from incentive alignment by targeting firms with low managerial shareholdings.

In summary, our findings indicate that HF implement measures which mitigate agency problems

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[16]Halpern et al. (1999) and Kieschnick (1998) find that LBO targets are subject to greater prior acquisition interest indicated by information in the financial press on potential takeover interest in the firm. The difference to Halpern et al.'s findings can be explained by the fact that the takeover market in the U.S. is more aggressive compared to Germany (Renneboog et al. (2007) for a similar line of reasoning).

and hence create wealth in the short run or benefit from merger arbitrage. PE mitigate agency problems and hence create wealth in the long run.

Future work should analyze the long-term development of HF and PE targets with respect to the development of share prices, changes in the firms' fundamental data like profitability, growth, capital structure and liquidity. In order to separate wealth creation from a wealth transfer from debtholders to shareholders, one could study the extent to which the HF and PE entry affects the prices of debt securities or insolvency risk. Moreover, one could add venture capital firms to the picture which are especially known for their certification and monitoring function with respect to growth firms. In past years, they have also acquired stakes in German publicly traded firms. It would be interesting to shed light on their motives and analyze the extent to which their monitoring and certification strategies differ from those of HF and PE.

References

Aboody, D. and B. Lev (2000), 'Information Asymmetry, R&D, and Insider Gain', *Journal of Finance*, Vol. 55, No. 1 (February), pp. 2747–2766.

Achleitner, A.-K. and C. Kaserer (2005), 'Private Equity Funds and Hedge Funds: A Primer', Discussion Paper (Center for Entrepreneurial and Financial Studies (CEFS), Technical University of Munich).

Achleitner, A.-K., C. Andres, A. Betzer and C. Weir (2008a), 'Economic Consequences of Private Equity Investments on the German Stock Market', Discussion Paper (University of Bonn).

Achleitner, A.-K., S.C. Schraml and F. Tappeiner (2008b), 'Private Equity Minority Investments in Large Family Firms: What are the Decision Criteria of the Family Owner?', Discussion Paper (Center for Entrepreneurial and Financial Studies (CEFS), Technical University of Munich).

Agarwal, V., N.D. Daniel and N.Y. Naik (2009), 'Role of Managerial Incentives and Discretion in Hedge Fund Performance', *Journal of Finance*, forthcoming.

Andres, C. (2008), 'Large Shareholders and Firm Performance – an Empirical Examination of Founding-Family Ownership', *Journal of Corporate Finance*, Vol. 14, No. 4 (September), pp. 431–445.

Andres, C., A. Betzer and C. Weir (2007), 'Shareholder Wealth Gains Through Better Corporate Governance - The Case of European LBO Transactions', *Financial Markets and Portfolio Management*, Vol. 21, No. 4 (December), pp. 403–424.

Ashton, D., T. Cooke and M. Tippett (2003), 'An Aggregation Theorem for the Valuation of Equity Under Linear Information Dynamics', *Journal of Business Finance & Accounting*, Vol. 30, Nos. 3&4 (April-May), pp. 413-40.

Beiner, S., W. Drobetz, M. Schmid and H. Zimmermann (2006), 'An Integrated Framework of Corporate Governance and Firm Valuation', *European Financial Management*, Vol. 12, No. 2 (March), pp. 249–283.

Bessler, W. and J. Holler (2008), 'Capital Markets and Corporate Control: Empirical Evidence from Hedge Fund Activism in Germany', Discussion Paper (Justus-Liebig University Giessen).

Bevilacqua, J. (2006), 'Convergence and Divergence: Blurring the Lines Between Hedge Funds and Private Equity Funds', *Buffalo Law Review*, Vol. 54, pp. 101–127.

Boyson, N.M. and R.M. Mooradian (2007), 'Hedge Funds as Shareholder Activists from 1994 − 2005', Discussion Paper (Northeastern University).

Brav, A., W. Jiang, F. Partnoy and R. Thomas (2008), 'Hedge Fund Activism, Corporate Governance and Firm Performance', *Journal of Finance*, Vol. 63, No. 4 (August), pp. 1729–1775.

Chan, K., Y.-C. Chan and W.-M. Fong (2004), 'Free Float and Market Liquidity: A Study of Hong Kong Government Intervention', *Journal of Financial Research*, Vol. 27, No. 2 (June), pp. 179–197.

Chan, L.K.C., J. Lakonishok and T. Sougiannis (2001), 'The Stock Market Valuation of Research and Development Expenditures', *Journal of Finance*, Vol. 56, No. 4 (August), pp. 2431–2456.

Clarke, J. and K. Shastri (2001), 'On Information Asymmetry Metrics', Discussion Paper (Georgia

Institute of Technology).

Clarke, R.N. (1989), 'SICs as Delineators of Economic Markets', *Journal of Business*, Vol. 62, No. 1 (January), pp. 17–32.

Clifford, C. (2007), 'Value Creation or Destruction? Hedge Funds as Shareholder Activists', Discussion Paper (Arizona State University).

Cording, M., P. Christmann and L.J. Bourgeois, III (2002), 'A Focus on Resources in M&A Success, A Literature Review and Research Agenda to Resolve Two Paradoxes', Discussion Paper (University of Virginia, Darden School of Business).

Cressy, R., F. Munari and A. Malipiero (2007), 'Playing to their Strength? Evidence that Specialization in the Private Equity Industry Confers Competitive Advantage', *Journal of Corporate Finance*, Vol. 13, No. 4 (September), pp. 647–669.

Dai, N. (2008), 'Does Investor Identity Matter? An Empirical Examination of Investments by Venture Capital Funds and Hedge Funds in PIPEs', *Journal of Corporate Finance*, Vol. 13, No. 4 (September), pp. 538–563.

Dyer, W.G., Jr. and D.A. Whetten (2006), 'Family Firms and Social Responsibility: Preliminary Evidence from the S&P 500', *Entrepreneurship Theory and Practice*, Vol. 30, No. 6 (November), pp. 785–802.

Fama, E.F. (1970), 'Efficient Capital Markets: A Review of Theory and Empirical Work', *Journal of Finance*, Vol. 25, No. 2 (May), pp. 383–417.

Frankel, R. and X. Li (2004), 'Characteristics of a Firm's Information Environment and the Information Asymmetry between Insiders and Outsiders', *Journal of Accounting and Economics*, Vol. 37, No. 2 (June), pp. 229–259.

Franks, J. and C. Mayer (1998), 'Bank Control, Takeovers and Corporate Governance in Germany', *Journal of Banking and Finance*, Vol. 22, No. 10 (October), pp. 1385–1403.

Geddes, R. and H.D. Vinod (2002), 'CEO Tenure, Board Composition and Regulation', *Journal of Regulatory Economics*, Vol. 21, No. 2 (March), pp. 217–235.

Gilian, S. and L. Starks (2007), 'The Evolution of Shareholder Activism in the United States', *Journal of Applied Corporate Finance*, Vol. 10/19, No. 1 (Winter), pp. 55–73.

Gorton, G.B. and Kahl, M. (1999), 'Blockholder Identity, Equity Ownership Structures, and Hostile Takeovers', Discussion Paper (National Bureau of Economic Research).

Greenwood, R. and M. Schor (2007), 'Hedge Fund Investor Activism and Takeovers', Discussion Paper (Harvard University).

Grossman, S.J. and O.D. Hart (1980), 'Takeover Bids, the Free-Rider Problem, and the Theory of the Corporation', *Bell Journal of Economics*, Vol. 11, No. 1 (Spring), pp. 42–64.

Gugler, K. and B.B. Yurtoglu (2003), 'Corporate Governance and Dividend Pay-out Policy in Germany', *European Economic Review*, Vol. 47, No. 4 (August), pp. 731–758.

Halpern, P., R. Kieschnick and W. Rotenberg (1999), 'On the Heterogeneity of Leveraged Going

Private Transactions', *Review of Financial Studies*, Vol. 12, No. 2 (Summer), pp. 281–309.

Hill, C. and P. Phan (1991), 'CEO Tenure as Determinant of CEO Pay', *Academy of Management Journal*, Vol. 34, No. 3 (September), pp. 707–717.

Ivashina, V. and A. Kovner (2007), 'The Private Equity Advantage: Leveraged Buyout Firms and Relationship Banking', Discussion Paper (Harvard Business School).

Hodkinson, L. and Partington, G.H. (2007), 'The Motivation for Takeovers in the UK', *Journal of Business Finance & Accounting*, Vol. 35, No. 1&2 (January-March), pp. 102–126.

Jensen, M.C. und W. Meckling (1976), 'Theory of the Firm: Managerial Behaviour, Agency Costs and Ownership Structure', *Journal of Financial Economics*, Vol. 13/3, No. 4 (October), pp. 305–360.

Jensen, M.C. (1986), 'Agency Costs of Free Cash Flow, Corporate Finance and Takeovers', *American Economic Review*, Vol. 76, No. 2 (May), pp. 59–75.

Kahan, M. and E.B. Rock (2007), 'Hedge Funds in Corporate Governance and Corporate Control', *University of Pennsylvania Law Review*, Vol. 155, No. 5.

Kaserer, C., A.-K. Achleitner, C. von Einem and D. Schiereck (2007), *Private Equity in Deutschland, Rahmenbedingungen, ökonomische Bedeutung und Handlungsempfehlungen*, (Books on Demand).

Kennedy, V.A. and R.J. Limmack (1996), 'Takeover Activity, CEO Turnover, and the Market for Corporate Control', *Journal of Business Finance & Accounting*, Vol. 23, No. 2 (March), pp. 267–285.

Kieschnick, R. (1998), 'Free Cash Flow and Stockholder Gains in Going Private Transaction Revisited', *Journal of Business Finance & Accounting*, Vol. 25, Nos. 1&2, pp. 187–202.

Klein, A. and E. Zur (2009), 'Entrepreneurial Shareholder Activism: Hedge Funds and Other Private Investors', *Journal of Finance*, forthcoming.

La Porta, R., F. Lopes-de-Silanes and A. Shleifer (1999), 'Corporate Ownership around the World', *Journal of Finance*, Vol. 54, No. 2 (April), pp. 471–517.

Lehn, K. and A. Poulsen (1989), 'Free Cash Flow and Stockholder Gains in Going Private Transactions', *Journal of Finance*, Vol. 44, No. 3 (July), pp. 771–787.

Lichtenberg, F.R. and D. Siegel (1990), 'The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behavior', *Journal of Financial Economics*, Vol. 27, No. 1 (September), pp. 165–194.

Lowenstein, L. (1985), 'Management Buyouts', *Columbia Law Review*, Vol. 85 (May), pp. 730–784.

Loderer, C. and U. Peyer (2002), 'Board Overlap, Seat accumulation and Share Prices', *European Financial Management*, Vol. 8, No. 2 (June), pp. 165–192.

Margaritis, D. and M. Psillaki (2007), 'Capital Structure and Firm Efficiency', *Journal of Business Finance & Accounting*, Vol. 34, Nos. 9&10 (November-December), pp. 1447–1469.

Mishra, C.S. and D.L. McConaughy (1999), 'Founding Family Control and Capital Structure: The Risk of Loss of Control and the Aversion to Debt', *Entrepreneurship Theory and Practice*, Vol. 23, pp. 53–64.

Morck, R., A. Shleifer and R.W. Vishny (1988), 'Management Ownership and Market Valuation: An Empirical Analysis', *Journal of Finance*, Vol. 20, Nos. 1&2 (January), pp. 293–315.

Nikoskelainen, E. and M. Wright (2007), 'The Impact of Corporate Governance Mechanisms on Value Increase in Leveraged Buyouts', *Journal of Corporate Finance*, Vol. 13, No. 4 (September), pp. 511–537.

Opler, T.C. and S. Titman (1993), 'The Determinants of Leveraged Buyout Activity: Free Cash Flow vs. Distressed Debt Costs', *Journal of Finance*, Vol. 48, No. 5 (December), pp. 1985–1999.

Partnoy, F. and R.S. Thomas (2006), 'Gap Filling, Hedge Funds, and Financial Innovation', Discussion Paper (Vanderbuilt University).

Renneboog, L., T. Simons and M. Wright (2007), 'Why Do Public Firms Go Private in the UK? The Impact of Private Equity Investors, Incentive Realignment and Undervaluation', *Journal of Corporate Finance*, Vol. 13, No. 4 (September), pp. 591–628.

Powell, R. and A. Yawson (2007), 'Are Corporate Restructuring Events Driven by Common Factors? Implications for Takeover Prediction', *Journal of Business Finance & Accounting*, Vol. 34, Nos. 7&8, pp. 1169–1192.

Sahlman, W.A. (1990), 'The Structure and Governance of Venture Capital Organizations', *Journal of Financial Economics*, Vol. 27, No. 2 (October), pp. 473–521.

Shleifer, A. and R.W. Vishny (1986), 'Large Shareholders and Corporate Control', *Journal of Political Economy*, Vol. 94, No. 3 (June), pp. 461–488.

Song, M. and R. Walkling (1993), 'The Impact of Managerial Ownership on Acquisition Attempts and Target Shareholder Wealth', *Journal of Financial and Quantitative Analysis*, Vol. 38/28, pp. 439–457.

Sorensen, M., P. Strömberg and J. Lerner (2008), 'Private Equity and Long-Run Investment: The Case of Innovation', Discussion Paper.

Weill, P.-O. (2005), 'Liquidity Premia in Dynamic Bargaining Markets', Discussion Paper (Stanford University).

Weir, C.M., D. Laing and M. Wright (2005a), 'Undervaluation, Private information, Agency Costs and the Decision to Go Private', *Applied Financial Economics*, Vol. 15, No. 13 (September), pp. 947–961.

Weir, C., D. Laing and M. Wright (2005b), 'Incentive Effects, Monitoring Mechanisms and the Market for Corporate Control: An Analysis of the Factors Affecting Public to Private Transactions in the UK', *Journal of Business Finance & Accounting*, Vol. 32, Nos. 5&6, pp. 909–943.

Weir, C., M. Wright and L. Scholes (2008), 'Public-to-Private Buy-Outs, Distress Costs and Private Equity', *Applied Financial Economics*, Vol. 18, No. 10 (June), pp. 801–819.

Wright, M., C. Weir and A. Burrows (2007), 'Irrevocable Commitments, Going Private and Private Equity', *European Financial Management*, Vol. 13, No. 4 (September), pp. 757–775.

A   Appendix

Table 1: Generic characteristics of HF and PE

See Achleitner and Kaserer (2005), Kaserer et al. (2007) and Bevilacqua (2007).

Characteristica	Hedge funds	Private equity funds
Investment focus	Variety of financial instruments: e.g. public equity, fixed income, options, futures, convertible securities, commodities	Public and private equity
Expertise	Focus on financial	Both financial and industrial
Investment horizon	Average initial lock up period of 10 months	Average period of 10 years
Performance based compensation	High	High
Determination of performance	Periodically, based on the net asset value of the portfolio via marking to market	At liquidation, based on the final cash flow from the investment portfolio
Redemption	On a periodic basis	At liquidation
Admittance of new investors	On a periodic basis	No

Table 2: Overview HF literature

Authors	Region	Horizon	Short term event study	Long term event study	Target characteristics	Changes
Brav et al. (2008)	U.S.	2001 - 2006	Positive abnormal returns driven by requests to spin-off assets or sell the firm, confrontational activism (use of suits and proxy fights), inversely linked to size and dividend yield	No reversal of the positive announcement effects in subsequent year	Low market to book ratio, sound operating profitability, low R&D, low dividend, more takeover defenses, higher CEO pay, slightly higher leverage, more diversified	Increase in operating performance, slight increase in leverage, decline in CEO pay, increase in CEO turnover rate
Clifford (2007)	U.S.	1998 - 2005	Positive effects, higher for activist funds, request of board seats, share buy-backs, opposing a merger/planning to induce one	Positive abnormal returns over one year for activist HF	Comparison of active and passive targets: active have better operating profitability, lower market-to-book, no indication for free cash flow problems	Operating performance increases, mainly due to divestment of underperforming assets, dividend increase
Boyson and Mooradian (2007)	U.S.	1994 - 2005	Positive abnormal returns, higher for confrontational activism	Positive abnormal returns	Small targets, poor prior stock performance, low growth opportunities, sound operating performance, large cash, low dividend yield and payout ratio, low R&D	Increase in Tobin's q (decline in undervaluation), reduction in cash holdings, improved operating performance
Greenwood and Schor (2007)	U.S.	1993 - 2006	Positive returns for the announcement of asset sales and induction of takeover	Large returns if the target is ultimately taken over by another firm	More likely acquisition targets, smaller, less analyst coverage and poor prior stock performance	Large fraction of targets merged with another company
Klein and Zur (2009)	U.S.	2003 - 2005	Controlling for the specific request, there is no significant difference between HF and non-HF	Positive abnormal returns	Sound operating profitability, high cash	Increase in dividends and leverage, decrease in cash
Bessler and Holler (2008)	Germany	2000 - 2006	Positive effects, higher abnormal returns compared to other entrepreneurial investors	Positive abnormal returns, inversely related to size	Active HF investments: large and liquid targets	Increase in systematic risk

Table 3: Overview PE literature

Authors	Region	Horizon	Short term event study	Premia	Target characteristics
Lehn and Poulsen (1989)	U.S.	1980 - 1987	NA	Premia positively depend on cash richness and low managerial equity	Low growth, cash richness and prior takeover target
Opler and Titman (1993)	U.S.	1979 - 1989	NA	NA	Combination of low growth prospects and high cash flows, low expected financial distress costs as proxied for by R&D, high degree of diversification
Halpern et al. (1999)	U.S.	1981 - 1986	NA	For very little management ownership premia are inversely related to prior stock performance	Non-management led LBO targets receive greater prior acquisition interest, poor prior stock performance, low debt to equity ratio and low managerial equity
Weir et al. (2005b)	UK	1998 - 2000	NA	NA	Higher CEO ownership, lower growth prospects, less duality with respect to identity of CEO and chairman
Weir et al. (2008)	UK	1998- 2001	NA	NA	More diversified, high asset collateralization, poor prior stock performance, quoted for shorter period of time, small size
Renneboog et al. (2007)	UK	1997 - 2003	Positive abnormal returns driven by prior stock performance, low leverage low managerial equity	Premia driven by prior stock performance, low leverage, low managerial equity	NA
Andres et al. (2007)	Europe	1997 - 2005	Positive abnormal returns driven by free float, managerial inefficiency and undervaluation; drivers on a macro level: poor protection of minority shareholders	NA	NA
Achleitner et al. (2008a)	Germany	1998 - 2007	Positive reactions driven by undervaluation, little actual use of leverage and the size of tax payments	NA	NA

Table 4: Summary of hypotheses

Hypothesis	Variable (definition)	Expected sign	
		HF	PE
Prior stock performance	Performance (share price 20 days before the entry divided by the average share price over the 250 days anteceding days divided by the equivalent ratio of CDAX price)	Neg	Neg
Free cash flow	Cash ((cash and cash equivalents)/total assets)	Pos	Pos
	Debt ((short term and long term debt)/total assets)	-	Neg
	Dividend yield (dividends/market value of equity)	Neg	-
	Q ((market value of equity and book value of debt)/total assets divided by the equivalent average measure for all DAX and MDAX firms)	Neg	Neg
	DEBT1 (debt*q)	-	Neg
	DIV1 (dividend yield/q)	Neg	-
	Tax (tax expenses/sales)	-	Pos
	Research (R&D expenditures/sales)	Neg	Neg
	Research (dummy) (set to 1 if the firm expenses R&D, otherwise 0)	Neg	Neg
Incentive alignment	Management (management ownership in %)	Neg	Neg
	Family (family ownership in %)	Neg	Neg
	Free float (sum of stakes which are smaller than 5%)	Pos	-
Ownership concentration	Free float (sum of stakes which are smaller than 5%)	Pos	Neg
	PB (dummy) (set to 1 if the second largest shareholder holds less than 5%)	Pos	Neg
	PB mod (dummy) (PB*1 if the investor builds up a counter-stake, PB*0 otherwise)	Pos	Neg
CEO tenure	Tenure (number of years which the CEO is in office)	Pos	-
	CEO1 (Tenure/performance)	Pos	-
Mergers and acquisitions	Acquisition (dummy) (set to 1 if the firm plans to make an acquisition)	Pos	-
	Target (dummy) (set to 1 if there are rumors that the firm is subject to takeover by an institution other than the PE/HF investor)	Pos	-

Table 5: List of variables

The table below shows the variable definition and source. Acounting information and market value of equity are as of the last fiscal year end figures before the investor entry.

Variable	Definition	Source
Acquisition (dummy)	Set to 1 if the firm plans to make an acquisition two years prior to entry and the acquisition is still outstanding	Bloomberg, Factiva, LexisNexis
Bank	Bank ownership in %	Hoppenstedt, Annual Reports
Buyback (dummy)	Set to 1 if the firm has conducted/announced share buy-back program two years prior to entry	Bloomberg, Factiva, LexisNexis, Company websites
Capex/EBITDA	Capital expenditures scaled by EBITDA	Datastream
Capex/sales	Capital expenditures scaled by sales	Datastream
Cash	(Cash and cash equivalents)/total assets	Datastream
Cash/MV	(Cash and cash equivalents)/market value of equity	Datastream
CASH1	Cash/q	Datastream
CEO1	Tenure/performance	Factiva, LexisNexis, Annual Reports, Datastream
Corporate	Ownership by other industrial firms in %	Hoppenstedt, Annual Reports
Debt	(Short term and long term debt)/total assets	Datastream
DEBT1	Debt*q	Datastream
DIV1	Dividend yield*q	Datastream
Dividend yield	Cash dividends/market value of equity	Datastream
Executed acquisition (dummy)	Set to 1 if the firm has undertaken an acquisition in the two years prior to entry	Bloomberg, Factiva, LexisNexis
Firm age	Number of years from foundation to entry	Bloomberg, Factiva, LexisNexis, Deutsche Börse
Founder (dummy)	Set to 1 if the founder is still CEO	Bloomberg, Factiva, LexisNexis, Company websites
Free float	Sum of stakes which are smaller than 5%	Hoppenstedt, Annual Reports
Government	Ownership by government institutions in %	Hoppenstedt, Annual Reports
Institutional	Institutional ownership in % (mutual funds, insurance companies)	Hoppenstedt, Annual Reports
Controlling owner (dummy)	Set to 1 if there is a shareholder with more than 25%	Hoppenstedt, Annual Reports
Management	Management ownership in %	Hoppenstedt, Annual Reports
Management	Family ownership in %, if family is on the executive board, family ownership is classified as management ownership	Hoppenstedt, Annual Reports
Net debt	(Short term debt and long term debt minus cash and cash equivalents) /total assets	Datastream

Table 6: List of variables (continued)

Variable	Definition	Source
PB (dummy)	Set to 1 if the second largest shareholder holds less than 5% and the largest holds more than 25% of shares	Hoppenstedt, Annual Reports
PB difference	Difference between the largest and second largest stake in %	Hoppenstedt, Annual Reports
PB mod (dummy)	PB*0 if PE has bought the stake from the largest share-holder and PB*1 otherwise	Hoppenstedt, Annual Reports, Merger Markets, Factiva, LexisNexis
PB ratio	Ratio of the largest and second largest stake in %	Hoppenstedt, Annual Reports
PB2 (dummy)	Set to 1 if the second largest shareholder holds less than 5%	Hoppenstedt, Annual Reports
PB2 mod (dummy)	PB2*0 if PE has bought the stake from the largest share-holder and PB2*1 otherwise	Hoppenstedt, Annual Reports, Merger Markets, Factiva, LexisNexis
Pbmod (dummy)	PBmod (dummy) (PB*1 if the investor builds up a counter-stake, PB*0 otherwise)	Hoppenstedt, Annual Reports
Performance	(Share price 20 days before entry/ divided by the average share price over the 250 days anteceding days)/CDAX equivalent ratio	Datastream
Q	(Market value of equity and book value of debt)/total assets divided by the equivalent average measure for all DAX and MDAX firms	Datastream
Research	R&D expenditures/sales	Datastream, Annual Reports
Research (dummy)	Set to 1 if the firm has R&D, otherwise 0	Datastream, Annual Reports
RET1	Retention/q	Datastream
Retention	If dividends<EBITDA, (1-dividends/EBITDA) otherwise 0	Datastream
Risk	Standard deviation of stock returns in the 250 trading days before 20 days to the announcement of entry	Datastream
ROA	Return on assets: EBITDA/total assets	Datastream
Size (MV)	Market value of equity (natural logarithm for regressions)	Datastream
Size (sales)	Sales (antural logarithm for regressions)	Datastream
Target (dummy)	Set to 1 if there are rumors that the firm is subject to takeover by an institution other than the PE/HF investor two years prior to entry	Bloomberg, Factiva, LexisNexis
Tax/MV	Tax expenses/market value of equity	Datastream
Tax/sales	Tax expenses/sales	Datastream
Tenure	Number of years which the CEO is in office	Factiva, LexisNexis, Annual Reports
Type of dominating shareholder (dummy)	Set to 1 if respective type (i.e. family, management, etc.) holds the largest stake	Hoppenstedt, Annual Reports
Type of controlling shareholder (dummy)	Set to 1 if respective type (i.e. family, management, etc.) holds a stake larger than 25%	Hoppenstedt, Annual Reports
Years since IPO	Number of years from IPO to entry	Bloomberg, Factiva, LexisNexis, Deutsche Börse

Table 7: Industry distribution

The table below shows the distribution of target and control firms across industries. The industry classification is obtained from Deutsche Börse.

Industry	HF		PE		Control	
	#	in %	#	in %	#	in %
Consumer goods	6	6.3%	13	22.8%	9	9.4%
Media	13	13.5%	5	8.8%	8	8.3%
Industrials	27	28.1%	12	21.1%	18	18.8%
Pharma & Healthcare	10	10.4%	3	5.3%	9	9.4%
Telecommunication	4	4.2%	3	5.3%	2	2.1%
Technology	8	8.3%	2	3.5%	8	8.3%
Software	15	15.6%	9	15.8%	15	15.6%
Utilities	0	0.0%	1	1.8%	3	3.1%
Chemicals	5	5.2%	2	3.5%	3	3.1%
Construction	1	1.0%	1	1.8%	3	3.1%
Automobile	2	2.1%	6	10.5%	4	4.2%
Basic resources	0	0.0%	0	0.0%	5	5.2%
Retail	3	3.1%	0	0.0%	5	5.2%
Transportation & Logistics	2	2.1%	0	0.0%	4	4.2%
N	96		57		96	

Table 8: Distribution of entries over time

The table below summarizes the entry dates of HF and PE targtes. The years for which data on the control sample is collected were randomly drawn from the entry dates of HF and PE.

Year	HF		PE		Control	
	#	in %	#	in %	#	in %
1998	0	0.0%	1	1.8%	1	1.0%
1999	0	0.0%	3	5.3%	3	3.1%
2000	0	0.0%	8	14.0%	5	5.2%
2001	1	1.0%	2	3.5%	0	0.0%
2002	1	1.0%	3	5.3%	3	3.1%
2003	2	2.1%	9	15.8%	11	11.5%
2004	6	6.3%	6	10.5%	10	10.4%
2005	19	19.8%	13	22.8%	24	25.0%
2006	28	29.2%	9	15.8%	20	20.8%
2007	39	40.6%	3	5.3%	19	19.8%
N	96		57		96	

Table 9: Stake sizes

The table shows the summary statistics on the stakes acquired by HF and PE. The stake size in % refers to the maximum stake which has been held over the time horizon under consideration. The euro volume is calculated as the maximum stake size multiplied by the market value of equity 20 trading days before the entry of the investor. Minority stake is defined as a stake smaller than 25% and a controlling stake is defined as stake greater than 25%. If an investor acquires a stake greater than 30%, he is obliged to make a public offer to the remaining shareholders which is why we include information on this threshold.

	HF	PE
in EUR million		
Average stake size	22.6	151.2
Median stake size	7.9	44.5
Standard deviation	35.9	241.3
in %		
Average stake size	8.2	71.6
Median stake size	5.6	82.3
Standard deviation	6.1	30.7
Stake type		
Minority stake	95.8%	8.8%
Controlling stake	4.2%	91.2%
Stake over 30%	0.0%	80.7%
Stake over 75%	0.0%	54.4%
Delisting	8.3%	47.4%

Table 10: Source of shares

The table shows the source of shares from which HF or PE acquired the initial stake in the target firm. The data have been collected from the financial press using Factiva and Bloomberg.

	HF	PE
Market	100.0%	22.8%
Family	0.0%	33.3%
Institutional investor	0.0%	22.8%
Other corporate	0.0%	21.1%

Table 11: Ownership structure

The table shows summary statistics on ownership structure. Free float is defined as the sum of shareholdings below 5%. Family is defined as the stake held by family members who are neither members of the executive board themselves nor related to them. Institutional refers to holdings of asset management firms and insurance companies. The shareholder with the largest stake is classified as the dominating shareholder. A shareholder which holds more than 25% is defined as a controlling owner. The columns under difference in means indicate the difference of HF targets to control firms, PE targets to control firms and HF to PE targets. We perform t-tests for the significance of the difference (Pearson's chi square tests for dummies). *, ** and *** denote statistical significance at the 10%, 5% and 1% level. The data have been winsorized at the 3% level.

In %	Mean			Median			Standard deviation			Difference in means		
	HF	PE	Control	HF	PE	Control	HF	PE	Control	HF	PE	HF vs PE
Shareholding structure												
Free float	58.01	43.20	47.13	56.20	42.00	48.64	24.59	27.04	22.69	10.89***	-3.93	14.82***
Family	3.54	15.84	13.12	0.00	0.00	0.00	7.70	25.43	23.37	-9.58***	2.72	-12.30***
Management	7.98	4.06	11.78	0.00	0.00	0.00	16.78	11.68	21.01	-3.80	-7.72***	3.92*
Institutional	10.59	8.91	5.80	8.88	0.00	0.00	11.15	16.87	13.39	4.79***	3.12	1.68
Bank	0.91	3.95	0.95	0.00	0.00	0.00	3.51	12.94	3.46	-0.03	3.01*	-3.04*
Government	1.44	2.26	3.35	0.00	0.00	0.00	10.25	11.96	14.09	-1.91	-1.10	-0.82
Corporate	11.50	21.78	17.87	0.00	0.00	0.00	21.96	34.04	28.10	-6.37*	3.92	-10.28**
Identity of dominating shareholder (dummy)												
Family	6.25	21.05	29.17	0.00	0.00	0.00	0.24	0.41	0.46	-0.23***	-0.08	-0.15**
Management	15.63	10.53	17.71	0.00	0.00	0.00	36.50	30.96	38.37	-2.08	-7.18	5.10
Institutional	32.29	17.54	9.38	0.00	0.00	0.00	47.00	38.37	29.30	22.92***	8.17	14.75**
Bank	2.08	5.26	3.13	0.00	0.00	0.00	14.36	22.53	17.49	-1.04	2.14	-3.18
Government	1.04	5.26	6.25	0.00	0.00	0.00	10.21	22.53	24.33	-5.21*	-0.99	-4.22
Corporate	25.00	38.60	31.25	0.00	0.00	0.00	43.53	49.11	46.59	-6.25	7.35	-13.6*
Identity of controlling shareholder (dummy)												
Family	3.13	17.54	23.96	0.00	0.00	0.00	17.49	38.37	42.91	-20.83***	-6.41	-14.42***
Management	11.46	5.26	17.71	0.00	0.00	0.00	32.02	22.53	38.37	-6.25	-12.45**	6.20
Institutional	4.17	8.77	4.17	0.00	0.00	0.00	20.09	28.54	20.09	0.00	4.61	-4.61
Bank	1.04	7.02	0.00	0.00	0.00	0.00	10.21	25.77	0.00	1.04	7.02**	-5.98*
Government	1.04	1.75	6.25	0.00	0.00	0.00	10.21	13.25	24.33	-5.21*	-4.50	-0.71
Corporate	17.71	28.07	27.08	0.00	0.00	0.00	38.37	45.33	49.16	-9.38	0.99	-10.36
Controlling owner	45.83	68.42	79.17	0.00	100.00	100.00	56.04	50.56	47.94	-33.33***	-10.75	-22.59**

Table 12: Firm fundamentals

The table shows the summary of firm fundamentals. All figures for dummy variables are denoted in %. Acquisition (target) refer to rumors that the firm plans an acquisition (is subject to takeover speculation). Executed acquisition refers to the firm having executed an acquisition during two years before the entry. PB denotes a dummy variable which is set to 1 if the firm is controlled by a shareholder with more than 25% and the second shareholder holds less than 5%. PB2 is set to 1 if the firm's second largest shareholder holds less than 5%. PB difference (PB ratio) refers to the difference (ratio) of the size the largest and second largest shareholder's stake. PB modified (PB2) is defined as follows: PB*1 (PB2*1) if PE has bought the stake from the largest shareholder and PB*1 (PB2*1) otherwise. Size in terms of market value refers to the value of equity. Risk denotes the standard deviation of returns over 250 trading days up to 20 days until the entry. Stock performance is defined the market adjusted share price 20 trading days before entry divided by the market adjusted average share price of the anteceding 250 days. Tenure is the length of time the CEO at the entry date is in office measured in years. The dummy founder is set to 1 if the founder is still on the management board and 0 otherwise. The columns under difference in means indicate the difference of HF targets to control firms, PE targets to control firms and HF to PE targets. We perform t-tests for the significance of this difference (Pearson's chi square tests for dummies). *, ** and *** denote statistical significance at the 10%, 5% and 1% level. The data have been winsorized at the 3% level.

	Mean			Median			Standard deviation			Difference in means		
	HF	PE	Control	HF	PE	Control	HF	PE	Control	HF	PE	HF vs PE
Acquisition (dummy)	35.42	15.79	28.13	0.00	0.00	0.00	48.08	36.79	45.20	7.29	-12.34*	19.63***
Target (dummy)	22.92	28.07	4.17	0.00	0.00	0.00	42.25	45.33	20.09	18.75***	23.9***	-5.15
Executed acquisition (dummy)	48.96	40.35	38.54	0.00	0.00	0.00	50.25	49.50	48.92	10.42	1.81	8.61
PB (dummy)	33.33	57.89	52.08	0.00	100.00	100.00	47.39	49.81	50.22	-18.75***	5.81	-24.56***
PB2 (dummy)	16.67	42.11	43.75	0.00	0.00	0.00	40.18	49.81	49.87	-27.08***	-1.64	-25.44***
PB difference	20.02	40.59	37.06	10.09	29.80	34.96	22.94	32.45	27.39	-17.05***	3.52	-20.57***
PB ratio	6.74	11.87	10.81	2.32	19.00	10.29	7.38	8.37	8.08	-4.08***	1.06	-5.13***
PB modified	16.67	42.11	43.75	0.00	0.00	0.00	40.18	49.81	49.87	-27.08***	-1.64	-25.44***
PB2 modified	33.33	57.89	52.08	0.00	100.00	100.00	47.39	49.81	50.22	-18.75***	5.81	-24.56***
Size (MV) in EUR m	130.73	84.09	95.27	121.24	56.00	61.01	0.00	0.00	0.01	35.46	-11.18	46.63*
Size (sales) in EUR m	159.21	248.21	163.50	143.12	248.05	120.52	0.01	0.00	0.01	-4.29	84.71	-89*
Risk in %	2.79	2.66	3.18	2.55	2.41	2.71	0.96	0.95	1.66	-0.39**	-0.52**	0.13
Performance in %	99.89	102.20	98.66	96.97	101.33	96.29	19.31	17.01	24.00	1.23	3.54	-2.31
Tenure	4.68	4.40	3.90	4.05	3.25	3.46	3.65	4.22	2.74	0.79*	0.51	0.28
Years since IPO	6.78	10.70	10.81	6.71	7.61	5.95	4.39	8.01	12.65	-4.03***	-0.11	-3.91***
Firm age in years	32.10	57.89	34.92	16.00	41.00	18.00	34.71	47.42	36.61	-2.81	22.98***	-25.79***
Founder (dummy)	17.71	5.26	14.58	0.00	0.00	0.00	38.37	22.53	35.48	3.13	-9.32**	12.45**

Table 13: Firm financials

The table exhibits financial data of the firms. Except for the interaction terms, all figures are indicated in %. Q is defined as (market value of equity + book value of total liabilities)/total assets divided by the equivalent measure of the average of all firms in DAX and MDAX in the respective year. Debt is defined as (short term debt + long term debt)/total assets. Net debt is (short term debt + long term debt – cash and cash equivalents)/total assets. Cash/MV presents cash and cash equivalents scaled by the market value of equity. Retention denotes (1-dividends/EBITDA) if dividends < EBITDA and 0 otherwise. The dummy variable buyback is set to 1 if the firm has performed/planned a share repurchase program in the 2 years prior to entry. Research presents the research and development expenditures scaled by sales. Research (dummy) is set to 1 if the firm expenses research and development, 0 otherwise. ROA denotes EBITDA/total assets. Tax/MV (Tax/sales) denotes tax expenses scaled by the market value of equity (sales). The columns under difference in means indicate the difference of HF targets to control firms, PE targets to control firms and HF to PE targets. We perform t-tests for the significance of this difference. *, ** and *** denote statistical significance at the 10%, 5% and 1% level. DEBT1 is defined as debt*q, CASH1 as cash/q, DIV1 as dividend yield*q, RET1 as retention/q and CEO1 as tenure/stock performance. The data have been winsorized at the 3% level.

	Mean			Median			Standard deviation			Difference in means		
	HF	PE	Control	HF	PE	Control	HF	PE	Control	HF	PE	HF vs PE
Q	109.47	78.90	89.40	89.32	72.90	77.42	52.50	27.19	41.64	20.06***	-10.51*	30.57***
Debt	22.29	20.68	18.61	18.30	18.31	18.78	18.55	18.77	16.71	3.68	2.07	1.61
Net debt	3.85	8.26	1.10	7.02	8.58	5.30	32.44	28.78	29.90	2.75	7.16	-4.41
Cash/total assets	13.93	10.38	13.38	10.83	7.06	8.08	12.37	11.37	13.32	0.55	-2.99	3.55*
Cash/MV	19.64	26.08	21.03	12.40	11.38	14.36	22.43	34.71	19.66	-1.39	5.06	-6.44
Dividend yield	0.88	2.43	2.12	0.00	1.25	0.02	1.42	4.92	4.06	-1.24***	0.30	-1.55**
Retention	63.27	51.49	51.90	77.80	60.71	60.29	40.81	42.06	41.07	11.37*	-0.40	11.78*
Buyback (dummy)	12.50	24.56	33.33	0.00	0.00	0.00	33.25	43.43	47.39	-20.83***	-8.77	-12.06*
Research	3.03	1.56	2.03	0.03	0.00	0.00	4.63	4.15	4.36	1.00	-0.48	1.47**
Research (dummy)	50.00	24.56	35.42	50.00	0.00	0.00	50.26	43.43	48.08	14.58**	-10.86	25.44***
Capex/EBITDA	46.42	50.21	53.61	35.59	45.57	37.61	38.49	31.08	43.52	-7.19	-3.39	-3.80
Capex/sales	5.49	4.31	5.72	3.19	3.51	3.74	5.80	3.41	7.22	-0.23	-1.41	1.18
ROA	11.28	10.41	8.26	10.88	13.20	10.48	11.00	13.45	14.01	3.02*	2.15	0.87
Tax/MV	2.93	5.27	4.12	1.88	4.07	3.19	3.21	6.42	4.15	-1.19**	1.15	-2.34**
Tax/sales	2.46	1.90	2.29	1.59	1.01	1.75	2.63	2.23	2.34	0.17	-0.39	0.56
Interaction terms												
DEBT1	22.22	15.25	14.93	16.37	13.35	13.04	21.01	15.44	14.92	7.28***	0.31	6.97***
CASH1	14.35	14.41	16.04	11.20	8.80	9.69	14.47	18.83	17.33	-1.69	-1.63	-0.07
DIV1	0.84	1.60	1.57	0.00	0.80	0.03	1.36	2.48	2.71	-0.73**	0.02	-0.76**
RET1	71.53	70.61	72.45	69.03	73.58	67.65	57.55	64.57	66.68	-0.91	-1.84	0.92
CEO1	4.88	4.42	4.16	4.22	3.14	3.79	4.05	4.63	3.02	0.73	0.27	0.46

Table 14: Spearman correlations

The following table shows the Spearman's rank correlation coefficients of the variables. * denotes significant correlation at the 10% level. The data have been winsorized at the 3% level.

	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	Fam	1.00																			
2	Mgmt	-0.16*	1.00																		
3	Free float	-0.15*	-0.03	1.00																	
4	PB (d)	-0.05	0.02	-0.29*	1.00																
5	R&D (d)	0.08	-0.03	0.14*	0.02	1.00															
6	R&D	0.08	0.00	0.13*	0.02	0.96*	1.00														
7	Tenure	-0.07	0.16*	0.02	-0.04	0.02	0.02	1.00													
8	Risk	0.02	0.19*	0.09	0.00	-0.12*	-0.06	-0.27*	1.00												
9	Perf	0.13*	-0.07	-0.12*	-0.05	0.03	0.02	0.04	-0.11*	1.00											
10	Size	0.00	-0.26*	-0.04	-0.01	0.06	-0.03	0.18*	-0.57*	0.22*	1.00										
11	Age	0.06	-0.16*	-0.14*	0.00	-0.01	-0.06	0.22*	-0.39*	0.10	0.40*	1.00									
12	Q	-0.08	0.04	0.04	-0.03	0.12*	0.16*	0.02	-0.05	-0.14*	-0.16*	-0.10	1.00								
13	Cash	-0.01	0.07	0.15*	-0.02	0.09	0.16*	0.07	0.24*	-0.01	-0.37*	-0.19*	0.22*	1.00							
14	Debt	0.07	-0.12*	0.06	-0.08	-0.03	-0.09	0.00	-0.07	-0.10	0.29*	0.10	-0.18*	-0.46*	1.00						
15	DEBT1	0.04	-0.08	0.10	-0.10	0.03	-0.03	0.01	-0.08	-0.13*	0.23*	0.07	0.09	-0.39*	0.94*	1.00					
16	DIV1	0.05	-0.09	-0.14*	0.11*	0.06	0.02	0.23*	-0.60*	0.17*	0.53*	0.37*	-0.05	-0.22*	-0.02	-0.05	1.00				
17	Dvd	0.06	-0.09	-0.14*	0.12*	0.06	0.01	0.23*	-0.60*	0.15*	0.55*	0.39*	-0.15*	-0.24*	0.01	-0.04	0.98*	1.00			
18	Tax	0.03	0.02	0.01	0.00	0.14*	0.15*	0.13*	-0.19*	0.24*	0.16*	0.04	0.17*	0.06	-0.19*	-0.15*	0.25*	0.21*	1.00		
19	Acq (d)	0.11*	-0.07	0.15*	-0.05	0.17*	0.13*	0.12*	-0.25*	0.01	0.28*	0.01	-0.05	-0.07	0.01	0.00	0.18*	0.19*	0.04	1.00	
20	Tar (d)	-0.10	-0.16*	-0.15*	0.03	-0.07	-0.08	0.04	-0.18*	0.24*	0.20*	0.10*	-0.01	-0.04	-0.07	-0.09	0.07	0.05	0.01	-0.09	1.00

Table 15: Binomial logistic regression – HF targets versus non-targets

The dependent variable is set to 1 for HF targets and 0 for non-targets. The data have been winsorized at the 3% level. χ^2 denotes the value for the likelihood chi square. z denotes the value for the z-statistics. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

Variable	Model 1 Coef.	Model 1 z	Model 2 Coef.	Model 2 z	Model 3 Coef.	Model 3 z	Model 4 Coef.	Model 4 z	Model 5 Coef.	Model 5 z	Model 6 Coef.	Model 6 z	Model 7 Coef.	Model 7 z
Family	-0.04	-2.72***	-0.04	-2.61***	-0.04	-2.82***	-0.04	-2.78***	-0.04	-2.45**	-0.04	-2.69***	-0.04	-2.69***
Management	0.00	-0.43	0.00	-0.07	0.00	-0.48	0.00	-0.28	-0.01	-0.92	0.00	-0.23		
PB	-1.30	-3.1***	-1.29	-3.08***	-1.35	-3.35***	-1.36	-3.33***			-1.39	-3.31***	-1.36	-3.4***
Research (dummy)	0.77	2.09**	0.71	1.95*	0.72	2.01**	0.90	2.59***	0.59	1.66*	0.80	2.19**	0.79	2.18**
Tenure	0.00	1.83*	0.00		0.00	1.39	0.00	1.62	0.00	1.95*			0.00	1.77*
Q	0.98	2.41**	0.90	2.28**	1.22	2.92***			0.96	2.42**	0.92	2.3**	0.94	2.36**
Dividend yield	-29.38	-2.52**	-34.72	-2.72***					-28.15	-2.55**	-23.28	-1.88*	-29.21	-2.51**
Acquisition	0.71	1.77*	0.65	1.63	0.53	1.39			0.63	1.60	0.78	1.88*	0.72	1.82*
Target	1.93	3.11***	1.78	2.84***	1.97	3.19***	1.80	2.99***	1.89	3.06***	2.02	3.22***	2.00	3.29***
Performance	0.27	0.33	0.11	0.13	0.16	0.20	-0.09	-0.12	0.57	0.71	0.17	0.21		
Risk			-27.37	-1.74*										
Cash					-1.05	-0.73								
DIV1							-24.43	-2.01**						
Free float									0.01	1.74*				
Size (sales)											-0.03	-0.26		
Intercept	-1.45	-1.41	0.14	0.12	-1.55	-1.52	0.04	0.05	-2.71	-2.44**	-0.60	-0.40	-1.19	-2.13**
Number of observations	192		192		192		192		192		192		192	
χ^2	69.4***		69.02***		62.55***		56.51***		62.13***		65.93***		69.11***	
Pseudo R^2	0.26		0.26		0.24		0.21		0.23		0.25		0.26	

Table 16: Binomial logistic regression − PE targets versus non-targets

The dependent variable is set to 1 for PE targets and 0 for non-targets. The data have been winsorized at the 3% level. χ^2 denotes the value for the likelihood chi square. z denotes the value for the z-statistics. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6		Model 7	
	Coef.	z	Coef.	z	Coef.	z	Coef.	z	Coef.	z	Coef.	z	Coef.	z
Family	0.00	0.40	0.00	0.28	0.00	0.48	0.00	0.28	0.00	0.36	0.70	0.48		
Management	-0.04	-2.54**	-0.04	-2.52**	-0.03	-2.24*	-0.03	-2.21**	-0.03	-2.13**	-2.14	0.03	-0.03	-2.22**
PB	0.06	0.17	0.04	0.12	0.04	0.11	0.09	0.24	-0.06	-0.16				
PB mod											-1.35	-2.97***		
Research (dummy)	-0.78	-1.85*	-0.76	-1.83*	-0.76	-1.79*	-0.86	-2.03**			-0.61	-1.42	-0.83	-2.03*
Research									-8.04	-1.74*				
Tenure	0.00	1.45	0.00	1.47					0.00	1.07	0.00	1.42		
Q	-0.97	-1.74*	-0.97	-1.71*	-0.76	-1.37	-1.14	-1.87*			-0.74	-1.32	-0.98	-1.73*
Acquisition	-1.34	-2.9***	-1.37	-2.93***	-1.26	-2.81***	-1.29	-2.84***	-1.03	-2.28**	-1.32	-2.83***	-1.20	-2.71***
Target	0.10	0.24												
Stock performance	0.89	0.98	0.86	0.97	1.00	1.12	1.07	1.15	0.61	0.66	1.16	1.24		
Dividend yield	-3.62	-0.88												
Debt			-0.76	-0.68										
Cash					-1.20	-0.68	-0.10	-0.96	-1.13	-0.71				
Size					-0.01	-0.09								
Risk							-37.29	-2.12**					-28.72	-1.95*
Firm age									0.01	1.73*				
Tax											-8.85	-0.95		
Intercept	-0.13	-0.13	0.01	0.01	0.04	0.03	2.38	1.22	-0.99	-1.02	-0.20	-0.18	1.88	2.60***
Number of observations	153		153		153		153		153		153		153	
χ^2	25.26***		24.89***		22.91***		27.46***		26.32***		35.58***		25.19***	
Pseudo R^2	0.13		0.12		0.11		0.14		0.13		0.18		0.12	

Table 17: Binomial logistic regression – HF targets versus PE targets

The dependent variable is set to 1 for HF targets and 0 for PE targets. The data have been winsorized at the 3% level. χ^2 denotes the value for the likelohood chi square. z denotes the value for the z-statistics. *, ** and *** denote statistical significance at the 10%, 5% and 1% level.

	Model 1 Coef.	Model 1 z	Model 2 Coef.	Model 2 z	Model 3 Coef.	Model 3 z	Model 4 Coef.	Model 4 z	Model 5 Coef.	Model 5 z	Model 6 Coef.	Model 6 z	Model 7 Coef.	Model 7 z
Family	-0.06	-3.03***	-0.06	-3.15***	-0.06	-3.56***	-0.06	-3.22***	-0.06	-3.21***	-0.05	-3***	-0.06	-3.11***
Management	0.02	0.94	0.01	0.80	0.01	0.74	0.01	0.53	0.01	0.62	0.01	0.79		
PB	-1.86	-3.52***	-1.92	-3.65***			-1.86	-3.53***	-1.87	-3.53***			-1.84	-3.57***
PB mod					0.07	0.14								
Research (dummy)	1.51	2.92***	1.41	2.79***	1.58	3.57***	1.53	2.93***	1.49	2.9***	1.28	2.65***	1.48	2.9***
Tenure	0.00	0.25	0.00	-0.10	0.00	-0.08	0.00	0.35	0.00	0.19				
Q	2.44	3.34***	2.61	3.5***			2.79	3.72***	2.61	3.49***	2.41	3.36***	2.63	3.62***
Acquisition	1.97	3.15***	1.85	3.10***			1.98	3.26***	1.94	3.23***	1.60	2.79***	1.92	3.19***
Target	0.32	0.59												
Performance	0.77	0.61	0.92	0.77	0.73	0.68	1.05	0.88	1.11	0.93				
Dividend yield	-21.38	-1.39												
DIV1											-31.43	-2.08**	-28.92	-1.85***
Cash			1.62	0.74										
DEBT1					2.46	2.16**								
Risk							33.34	1.24						
Size									-0.16	-1.05				
Free float											0.02	2.07**		
Intercept	-2.49	-1.58	-2.94	-1.89*	-0.84	-0.71	-4.12	-2.2**	-1.11	-0.49	-2.75	-3.15	-1.56	-2.27**
Number of observations	153		153		153		153		153		153		153	
χ^2	76.38***		73.09***		39.31***		74.13***		73.63***		66.37***		75.68***	
Pseudo R^2	0.38		0.36		0.19		0.37		0.36		0.33		0.37	