Sources of Value Gains in Minority Equity Investments by Private Equity Funds: Evidence from Block Share Acquisitions

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ABSTRACT

Using a large sample of block share acquisitions made by private equity (PE) funds over the 1990 to 2006 period, we examine the sources of value gains in PE minority equity investments. We find that compared to non-PE acquirers, PE acquirers are more likely to place representatives with finance experience on a target's board, particularly when the target performs poorly or when it has more pronounced agency problems. PE acquirers are also more likely to place representatives with experience in the target's industry on the target's board when the target has more complex operations (e.g., multiple segments or higher R&D intensity). The targets in PE acquisitions, particularly those whose boards have representatives from PE acquirers, realize both higher abnormal announcement returns and better post-acquisition operating performance than do targets in other types of acquisitions. Target announcement abnormal returns and post-acquisition operating performance are also higher when PE-appointed directors have expertise in the target's industry, when they sit on the boards of poorly performing targets, or when they sit on the boards of targets with higher R&D intensity. These findings suggest that the governance and operational engineering that PE acquirers apply to their targets constitutes important sources of value creation in PE minority equity investments, and that such value creation is particularly evident when the need for target oversight and/or advice is greater.

1. Introduction

Minority equity investments by private equity (PE) funds have become an important part of block share acquisitions in the U.S. over the past two decades. For example, according to Thomson Financial's Security Data Corporation (SDC) Platinum database, PE minority equity investments account for almost 11% of our sample of block share acquisitions from 1990 to 2006. Consistent with this observation, Kaplan and Strömberg (2009) also argue that given PE funds' accumulated experience in minority equity investments and portfolio companies' increased demand for such investments, PE funds are increasingly likely to take minority equity positions in their portfolio companies, rather than buying the target companies' entire equity. In spite of this growing importance of PE minority equity investments in block share acquisitions, we know relatively little about the role of PE funds as monitors/advisors and their effect on firm performance. In particular, there is little evidence concerning how PE funds' minority equity investments compare with their majority equity investments and whether PE funds' motives and the sources of value gains differ across the two types of investments.[1]

In this study we seek to shed light on the sources of value gains in PE funds' minority equity investments by using a sample of partial block acquisitions of publicly held targets (in which PE investors acquire at least 5% but less than 50% of the target's outstanding shares) in the U.S. from 1990 to 2006. We focus on block share acquisitions because, compared to other types of minority share acquisitions in which the investors purchase less than 5% of the target's equity, more detailed information on deal characteristics and post-acquisition governance activities is publicly available for these acquisitions. Further, block share acquisitions represent a setting where block acquirers have

[1] For studies that examine the sources of value gains in PE funds' majority equity investments, see Kaplan (1989a, 1989b), Lichtenberg and Siegel (1990), Smith (1990), Harris, Siegel, and Wright (2005), Bergström, Grubb, and Jonsson (2007), Bargeron et al. (2008), Boucly, Sraer, and Thesmar (2008), Acharya, Kehoe, and Reyner (2009), Acharya et al. (2010), and Guo, Hotchkiss, and Song (2011).

strong incentives to monitor and advise target managers, so their role as monitors/advisors is expected to be magnified in this case.

Focusing on governance, operational, and financial engineering as potential sources of value creation in PE minority equity investments (Jensen, 1989; Kaplan and Strömberg, 2009), we show that PE funds' governance and operational engineering activities are key channels through which they create value in such investments. Specifically, we find that, compared to non-PE block acquirers, PE block acquirers purchase a larger percentage of target shares and hold these target shares for a longer period of time. PE acquirers are also more likely to place representatives on the target's board, and these representatives are more likely to sit on governance-related board committees such as compensation, executive, nominating, and stock option committees. These findings suggest that PE acquirers play an active role in monitoring target management, supporting the view that PE investors' governance engineering activities are an important source of value gains in PE minority equity investments (Kaplan, 1991; Strömberg, 2007; Kaplan and Strömberg, 2009).

Next, we find that compared to directors appointed by non-PE acquirers, those appointed by PE acquirers are more likely to have finance experience. Such appointments are more likely to occur when the target performs poorly or when it has more pronounced agency problems. We also find that PE acquirer-appointed directors with finance experience are more likely to replace poorly performing target management than other directors, suggesting that PE acquirers engage in more active monitoring of target management when the need for target oversight is greater. Furthermore, when the target has more complex operations (e.g., multiple segments or higher R&D intensity), PE acquirers are more likely to place representatives with experience in the target's industry on the target's board. These findings suggest that PE funds use their operating expertise to create value in portfolio companies, particularly when these companies have greater advisory needs, and that the board of directors is an

important channel through which PE funds achieve this value creation (Gadiesh and MacArthur, 2008; Kaplan and Strömberg, 2009).

Finally, we find that targets in PE acquisitions, particularly poorly performing targets, targets with complex operations (i.e., high R&D intensity), or targets whose boards have representatives from their PE acquirers, experience both higher abnormal announcement returns and better post-acquisition operating performance than do targets in non-PE acquisitions. The value creation in PE block acquisitions is also more pronounced when PE-appointed directors have experience in the target's industry. Thus, targets benefit more when PE acquirers are able to bring more oversight and better advice to them.[2]

Overall, our findings suggest that PE funds' governance and operational engineering activities are key channels through which they create value in PE minority equity investments.

In evaluating the sources of value gains in PE minority equity investment, we extend the existing literature in several important ways. First, to the best of our knowledge, our study is the first to examine the sources of value gains in PE investment from the perspective of minority equity investments. We investigate whether PE funds' partial block share acquisitions affect target firms' value and operating performance and show that PE funds can create value in their portfolio companies without having full control, and thus minority equity investments can be another important means through which PE funds add value.

Second, our study expands the literature on PE investments. Previous literature focuses largely on LBOs to examine the sources of value gains in PE investments and finds mixed evidence on value creation. For example, Kaplan (1989a, 1989b), Smith (1990), and Acharya, Kehoe, and Reyner (2009) show that financial engineering is an important source of value creation in buyout transactions in

[2] However, it is possible that PE acquirers are more likely to choose targets for which their governance and operational engineering expertise can be more valuable. In this case, our results can be driven by PE acquirers' ability to choose targets rather than by their post-acquisition activities per se. In Section 7, we further address this selection issue using Heckman model.

which PE funds acquire full control of the target, and Kaplan (1989b) identifies tax benefits as a source of value creation in such transactions. On the other hand, Bargeron et al. (2008), Acharya et al. (2010), and Guo, Hotchkiss, and Song (2011) argue that operating improvements in PE funds' portfolio companies are not a result of PE funds creating value but rather of PE funds choosing to invest in those companies whose operating performance is likely to improve in the future, that is, of PE investors having superior information. Consistent with the view that financial engineering is an important source of value creation in PE investments, we find that top management equity ownership and incentive-based CEO compensation (i.e., the amount of stock and option awards as a percent of total CEO compensation) increase significantly in PE target firms after the block share acquisitions. However, these increases are not related to target acquisition announcement returns or post-acquisition operating performance changes. We also find that the industry and operating expertise that PE funds can bring to their portfolio companies constitutes important sources of value creation in PE minority equity investments, supporting Kaplan and Strömberg's (2009) conjecture that PE funds' capabilities in operational engineering play an important role in PE minority equity investments. These findings suggest that both similarities and differences in the sources of value gains exist between PE full and partial acquisitions.

Third, our study provides new evidence on the role of PE funds (Gertner and Kaplan, 1996; Cornelli and Karakas, 2008; Acharya et al., 2010) by showing that target directors appointed by PE acquirers play both monitoring and advisory roles in target firms.

Finally, we complement the literature on block share acquisitions by investigating the role of PE investors as large shareholders. Prior studies examine the monitoring and advisory roles performed by various types of institutional block shareholders such as corporate investors (Allen and Philips, 2000), hedge funds (Brav et al., 2008; Klein and Zur, 2009), and local institutional investors (Kang and Kim, 2008), and show that these institutional investors performs important role in establishing value-

enhancing corporate strategies and policies. Our study sheds further light on the importance of the presence of active institutional investors in increasing firm value by documenting various roles performed by PE block shareholders.

The remainder of the paper proceeds as follows. In Section 2, we review the literature on PE investments and discuss the main testable implications for the sources of value gains in PE minority equity investments. In Section 3, we describe the data and summary statistics. In Section 4, we report univariate results for the sources of value creation in PE investment by examining PE funds' governance, operational, and financial engineering activities in their portfolio companies. In Section 5, we report abnormal announcement returns and long-term operating performance for targets and present results from cross-sectional regressions. In Section 6, we discuss results from tobit regressions that examine the determinants of board representation by acquirers and logistic regressions that examine the likelihood of nonroutine top management turnover in targets. Section 7 presents results from robustness tests. Finally, we present concluding remarks in Section 8.

2. Literature Review and Testable Implications

Previous literature shows that PE investments are generally associated with an improvement in firm performance. For instance, for a sample of going-private deals in the U.S. during the 1980s, Kaplan (1989b) finds a significant increase in both post-buyout operating profit margin (EBITDA/sales) and post-buyout cash flow to sales. Lichtenberg and Siegel (1990) also find a significant improvement in post-buyout total factor productivity. Harris, Siegel, and Wright (2005), Bergström, Grubb, and Jonsson (2007), and Boucly, Sraer, and Thesmar (2008) confirm such improvements in post-buyout operating performance and productivity for going-private transactions in Europe.[3] Jensen (1989) and Kaplan and Strömberg (2009) argue that this value creation in PE investments mainly come from PE

[3] However, Weir, Jones, and Wright (2007), Acharya et al. (2010), and Guo, Hotchkiss, and Song (2011) show that post-buyout operating improvements are only modest for post-1980s LBOs in the U.S. and U.K.

acquirers' governance engineering, operational engineering, and/or financial engineering activities. In this section we briefly describe several testable implications for the effects of such activities on value creation in PE minority equity investments.

2.1. Governance Engineering

Kaplan and Strömberg (2009) refer to governance engineering as the way PE funds control the boards of their portfolio companies and monitor these companies' managerial performance. Unlike hedge funds and mutual funds, which tend to hold stocks for a short period and invest mostly in liquid stocks, PE funds are generally considered to be long-term investors with less demand for liquidity.[4] Kaplan (1991) and Strömberg (2007) find that the median lengths of PE ownership in their secondary buyout samples are 6.82 years and 9 years, respectively. This long-term ownership can provide PE funds with both the incentive and the ability to monitor target managers. For example, Lerner (1995) shows that venture capitalists are more likely to appoint representatives onto the boards of the companies they invest in, and that their governance activities are more intense when the need for oversight in portfolio companies is greater.

To investigate whether the governance engineering that PE funds apply to their portfolio companies creates value, we focus on two types of governance activities: board appointments and nonroutine top executive turnover.[5] We expect PE acquirers are more likely to appoint representatives onto the target's board (to replace poorly performing target management) than non-PE acquirers,

[4] According to Brav et al. (2008), hedge funds exhibit significantly higher trading liquidity than otherwise comparable firms, and their median holding period for completed deals is only about one year.

[5] Previous studies show that outside directors on the board play an instrumental role in internal governance. Brickley and James (1987), Weisbach (1988), and Byrd and Hickman (1992), for example, show that independent outside directors protect the interests of shareholders when there are agency problems between managers and shareholders. Denis, Denis, and Sarin (1997), Bethel, Liebeskind, and Opler (1998), and Kang and Shivdasani (1995) argue that removal of the top executive is one of the most aggressive actions taken in the course of corporate governance and show that outside blockholders play an important role in top executive turnover.

particularly when the need for target oversight is greater, such as when the target performs poorly or has more pronounced agency problems. To the extent that the directors appointed by PE acquirers perform a value-enhancing monitoring function, we also expect targets' abnormal announcement returns and post-acquisition long-term operating performance to be positively related to board membership of PE funds in targets, with this relation more evident when the need for target oversight is greater. We capture poor target performance using an indicator variable for low return on assets and an indicator variable for low profit margin, and we capture a target's agency problems using an indicator variable for high cash flow and low Tobin's *q* (Jensen, 1986).

2.2. Operational Engineering

Operational engineering refers to the industry and operating expertise that PE funds can bring to their portfolio companies to create value (Kaplan and Strömberg, 2009). Gadiesh and MacArthur (2008) and Kaplan and Strömberg (2009) argue that PE funds can use their industry knowledge to identify attractive investments and to develop and implement value-creation plans for their portfolio companies. Acharya et al. (2010) further show that PE-appointed directors' operating expertise can be an important channel through which PE funds create value for their portfolio companies, and that the greater engagement and commitment of PE-appointed directors are major sources of value gains in PE investments.

To evaluate whether the operational engineering that PE acquirers apply to their targets is an important source of value gains in PE funds' block share acquisitions, we use PE-appointed directors' past work experience as a key indicator of operational engineering capability. Specifically, we focus on PE-appointed directors' past experience in the target's industry and in the finance area. We expect that, compared to non-PE acquirers, PE funds are more likely to appoint representatives with industry (finance) experience onto the target's board, and that such appointments are associated with higher

abnormal announcement returns and better post-acquisition operating performance for targets than the appointment of other types of directors. To the extent that PE-appointed directors' past work experience is more valuable when targets have greater advisory needs, we also expect these effects to be more pronounced when targets observe poor operating performance, or when they have greater complexity.[6] We measure a target's complexity using indicator variables for high R&D intensity and for multiple segments.

2.3. Financial Engineering

Jensen (1989) and Kaplan (1989a, 1989b) argue that one of the key financial engineering changes that PE funds can make in their portfolio companies is to motivate the managers to maximize shareholder wealth. For example, by increasing top executives' pay-for-performance sensitivity, PE funds can provide improved incentives to managers and thus increase the target's operating performance and firm value. Supporting this view, Kaplan (1989b) finds that for a sample of 76 management buyouts (MBOs) of public companies completed between 1980 and 1986, the equity holdings of the management team increase from a median of 5.88% before the MBO to 22.63% after the MBO. Likewise, Archarya et al. (2010) document a median CEO (management team) equity holding of almost 6% (15%) for a sample of 66 large buyouts in the U.K. from 1996 to 2004, and Kaplan and Strömberg (2009) find similar figures for a sample of 43 LBOs in the U.S. from 1996 to 2004.

Another financial engineering strategy that PE funds can apply to their portfolio companies is to increase targets' leverage ratios. Jensen (1986) argues that a high debt ratio reduces managerial discretion over the allocation of the free cash flow and thus induces firms to make efficient investment decisions. High debt also generates large interest deductions, which result in more corporate tax

[6] Klein (1998) suggests that complex firms have greater advisory needs. She argues that firms can be complex along different dimensions, such as scope of operations, size, and the extent of reliance on external capital.

savings. These benefits of debt increase firm value and thus can be an important source of value creation in PE investments. Supporting Jensen's (1986) free cash flow hypothesis, Kaplan (1989a) shows that buyout companies experience a reduction in their post-buyout capital expenditures. In addition, Kaplan (1989a) finds that the value of the tax benefits for his sample of buyout companies varies from a lower bound estimate of 21.0% to an upper bound estimate of 142.6% of the premium paid to pre-buyout shareholders. These results suggest that tax benefits can be an important source of the wealth gains in PE investments.

To the extent that PE funds' incentives to use these types of financial engineering also exist for their minority equity investments, we expect improved management incentives and increased debt to play an important role in explaining gains in PE funds' block acquisitions. We measure changes in target firms' management incentives using the following three variables: 1) the change in equity ownership held by the target's top management from year -1 to year +3 (relative to the block share acquisition announcement year), 2) the change in fixed CEO salaries as a proportion of total CEO compensation from year -1 to year +3, and 3) the change in incentive-based compensation (stock and option awards to the CEO) as a fraction of total CEO compensation from year -1 to year +3. We measure changes in targets' leverage as the change in the ratio of total debt to total assets from year -1 to year +3. We expect that targets' acquisition announcement returns and post-acquisition operating performance are positively related to these change variables except for the change in the proportion of fixed CEO salaries. To the extent that fixed salaries are not tied to performance, we expect the change in the proportion of fixed CEO salaries to be less positively, or even insignificantly, related to target returns and operating performance.

3. Data and Summary Statistics

3.1. Data

Our sample consists of domestic block share acquisitions between 1990 and 2006. We end the sample period in 2006 because we measure post-acquisition governance activities, post-acquisition operating performance, changes in target firms' management incentives using data up to three years after the block acquisition. We begin with the 13,364 partial acquisitions available on SDC database between 1990 and 2006, where partial acquisitions are those in which the acquirer initially holds less than 5% of a target firm's outstanding shares and then purchases more than 5% but less than 50% of the firm's outstanding shares. We then exclude deals in which 1) the acquirer is an Employee Stock Ownership Plan or an Employee Benefits Trust, 2) the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer), since in such cases the identity of the acquirer that initiates post-acquisition governance activities in the targets is not clear, 3) information on the percentage of the target acquired, the percentage of the target held prior to the acquisition, and the percentage of the target held after the acquisition is not available, and 4) stock returns and financial data for targets are not available in CRSP and COMPUSTAT, respectively. Finally, we require that a block share purchase's initial public announcement date be available in *Factiva,* where the initial public announcement date is the date an acquisition news announcement first appears in this publication. These restrictions result in a final sample of 1,132 targets.[7]

We obtain data on top executive, board of director, and managerial ownership of target firms from proxy statements and annual reports. These sources are examined during the holding period of block ownership up to three years after the acquisition. We define the holding period as the period from the date when the investor announces the acquisition of a target firm's block equity to the date when it

[7] Holderness (2009) shows that the mean (median) ownership held by outside blockholders in U.S. publicly held firms is almost 11% (7%) of total ownership.

decreases its holding in the target to less than 5%.[8] The number of target segments is obtained from the Compustat Industry Segment file.

There is no standard definition of PE fund per se, so its definition varies widely among academics and in practice. While the narrowest definition of PE fund refers to buyout funds only (Ljungqvist and Richardson, 2003a; Jensen, 1989), its broadest definition includes nearly all types of private investment funds such as buyout, venture capital, mezzanine, distressed, and real estate funds.

In this paper we define PE funds as funds that are classified as either buyout funds or venture capital funds. We, first, attempt to define PE funds using fund level information. If we are not able to define PE funds at the fund level, we refer to their holding companies or general partners, i.e. private equity firms, and define PE funds as funds that belong to holding companies or general partners that consist mainly of buyout funds, venture capital funds, or both. In this case, we make sure that PE investments are the holding company's or general partner's main business by imposing the requirement that PE investments account for at least 50% of their business. For example, Goldman Sachs engages in both investment banking and PE businesses. However, since assets under management by Goldman Sachs' private equity division amount to less than 50% of the total assets under management by Goldman Sachs, we do not define Goldman Sachs as a PE fund. In contrast, we define Goldman Sachs Capital Partners as a PE fund.

The rationale for restricting PE funds to those with either of these two fund types is as follows. First, buyout and venture capital funds are known to be the main sectors of the PE industry. For example, according to Ljungqvist and Richardson (2003a, 2003b), buyout and venture capital funds

[8] There are 35 acquisitions in which the acquirers eventually acquire more than 50% of the target's equity during holding periods of up to three years. Of these 35 acquisitions, eight are by PE funds and 27 are by non-PE funds. In tests not reported here, we repeat all analyses in the paper excluding the 35 acquisitions in which the acquirer eventually purchases more than 50% of the target's equity and find that the results are qualitatively unchanged.

account for more than 97.5% of PE funds recorded in the Venture Economics database.[9] Second, our definition of PE funds is consistent with that used in previous studies, such as Ljungqvist and Richardson (2003b), Kaplan and Schoar (2005), and Metrick and Yasuda (2010).[10]

We classify our sample acquirers into PE and non-PE acquirers by extensively searching *Factiva* and *Google* for their identity. In particular, using various versions of the acquirer's name as key words, we first search *Factiva* and *Google* to find acquirers' homepages and news articles describing the acquirers / acquisitions. We then use company information from both of these sources to classify acquirers into PE and non-PE acquirers. If we are not able to obtain detailed information about the acquirers from their homepages and have to rely only on news articles, we require that at least three different news articles be available to determine whether the acquirer is a PE or non-PE fund. We also carefully examine the nature of a fund's investment history if its current or historical investment portfolio is available on the internet. In most cases we are able to classify our sample of acquirers into buyout firms, venture capital funds, both buyout and venture capital funds, or non-PE funds. Specifically, we identify 123 (10.9%) PE acquirers and 1,009 (89.1%) non-PE acquirers. Of the 123 PE acquirers, 66 are acquirers with venture capital funds and 77 are acquirers with buyout funds. In 22 cases, PE acquirers can be classified as both buyout and venture capital funds.

3.2. Descriptive Statistics

Table 1 reports the distribution of the sample of 1,132 block acquisitions according to acquisition announcement year, target industry, and whether the acquirers are PE or non-PE funds. The four years

[9] Using the Venture Economics database, a comprehensive database for the PE industry, Ljungqvist and Richardson (2003a, 2003b) show that over the 1981 to 2001 period venture funds account for 74.6% of total funds and buyout funds account for 90.4% of non-venture funds in the PE industry. This implies that venture capital and buyout funds together account for more than 97.5% of all PE funds in Venture Economics database.

[10] Our definition of PE funds does not include hedge funds because the sources of value gains could be quite different between hedge funds and PE funds. While hedge funds typically demand a rapid exit strategy, PE funds usually do not. This different preference for liquidity between hedge funds and PE funds can potentially affect their risk tolerance, desired rates of return, and activism strategies.

from 1994 through 1997 are the most active years with respect to acquisition announcements, with 125 (11.0%), 140 (12.4%), 155 (13.7%), and 115 (10.2%) cases, respectively. Most of the targets are in manufacturing (43.7%), services (23.0%), and wholesale and retail trade industries (10.8%).

Table 2 presents summary statistics for the sample targets. We measure target characteristics as of the fiscal year-end that immediately precedes the announcement date of block share acquisitions. While the mean total assets is not statistically different between PE and non-PE targets, the median total assets of PE targets is significantly larger than that of non-PE targets. Similarly, we find that both the median Tobin's *q* (market value of equity plus book value of debt divided by book value of total assets) and the median number of segments for PE targets are significantly higher than those for non-PE targets. These results suggest that PE acquirers prefer large, high growth, and complex firms as their targets. Leverage (total debt divided by market value of equity plus book value of debt), operating performance (operating income divided by total assets), prior stock return (four-digit SIC industry-adjusted return for the past one year), R&D intensity (R&D expenditures divided by total sales), and the free cash flow indicator (equals one if the ratio of cash flow to total assets is above the sample median and Tobin's *q* is below the sample median, and zero otherwise) show little statistically significant differences between PE and non-PE targets. The insignificant difference in the past performance variables and the free cash flow indicator variable between PE and non-PE targets suggests that the extent of manager-shareholder agency problems is similar between the two sets of targets.

In Table 3, we compare important transaction characteristics of PE acquisitions to those of non-PE acquisitions. Panel A shows summary statistics for the percent of shares purchased by acquirers around the announcement date and the sum of the percent of shares acquired around the announcement date and the percentage of additional shares that the acquirer purchased over the three years after the

announcement date.[11] The mean percent of shares purchased, measured by both approaches, is significantly larger for PE acquisitions than for non-PE acquisitions. The median shows a similar pattern.

Panel B of Table 3 shows summary statistics for block ownership holding periods. We find that 44% of PE acquirers hold block shares for longer than three years and 20% of PE acquirers hold block shares for longer than two years but less than three years. The corresponding numbers for non-PE acquirers are 30% and 12%, respectively. These holding period differences between PE and non-PE acquirers are significant at the 1% and 5% levels, respectively. We also find that the fraction of acquirers that hold block shares for less than one year is significantly lower in PE acquisitions than in non-PE acquisitions (14% versus 38%). Taken as a whole, these results suggest that PE acquirers hold block ownership in targets for a longer period than non-PE acquirers, consistent with Kaplan (1991) and Strömberg (2007), who find evidence of long-term ownership of PE funds in their buyout portfolio.[12] Bushee (1998) argues that "dedicated" institutional investors have a long investment horizon while "transient" institutional investors have a short-term time horizon. In this context, our findings suggest that PE acquirers may be "dedicated" investors, who adopt longer-term strategies and actively monitor target management, while non-PE acquirers may be "transient" investors, who implement short-term strategies and are therefore less likely to engage in governance activities in targets.

Panel C of Table 3 summarizes results on the fraction of acquirers that indicate that the purchase of shares is for control purposes. We classify an acquisition as for control purposes if the acquirer claims

[11] If the acquirer continues to purchase target shares subsequent to the initial block acquisition, using the block acquired only in the initial transaction will underestimate the acquirer's total shareholdings in the target and its incentives to monitor. Thus, we measure the size of blocks acquired as the sum of the percentage of shares acquired at the transaction dare and the percentage of additional shares purchased over the three years after the transaction date.

[12] While we find that the median holding period for our sample of PE block acquirers is longer than two years, Brav et al. (2008) report that the median holding period for their sample of hedge fund block acquirers is only one year. Thus, PE block acquirers tend to hold target stocks for a longer period than hedge fund block acquirers.

an intention to control the target in the SDC 13D filing, the DEF 14A proxy statement, or the 10-K annual statement that immediately follows the deal announcement.[13] We find that the fraction of acquisitions that give a control motivation is higher for PE acquisitions than for non-PE acquisitions (14% versus 10%), but the difference is not statistically significant.

4. Board Representation, CEO Turnover, and Managerial Compensation: Univariate Tests

In this section we examine the governance, financial, and operational engineering changes that acquirers make in their targets after the block acquisitions, and we compare whether the extent and nature of these changes are different between PE and non-PE acquisitions.

4.1. Governance Engineering

To investigate how block acquirers apply governance engineering to their portfolio companies, we focus on two types of post-acquisition governance activities, namely, board appointment and nonroutine top executive turnover activities. We obtain information on board representation and top executive turnover from proxy statements and annual reports by searching these sources for up to three years after the date of the acquisition. Following Denis, Denis, and Sarin (1997) and Kang and Kim (2008), we refer to turnover events in which the top executive is removed due to death, illness, or other nongovernance-related reasons as routine turnover. Also, we classify a management change as normal if the stated reason for the change is retirement and the retiring manager is between the ages of 64 and 66.[14] We refer to all other turnover events as nonroutine turnover.

[13] Specifically, if the purpose of an acquisition is related to a hostile takeover, proxy fight, or any other action related to seeking control, we classify the acquisition as pursued for control purposes: we classify all other acquisitions, such as buying an undervalued firm, as pursued for investment reasons.

[14] We also experiment with alternative definitions of nonroutine turnover, assuming that normal retirement takes place at any age above 60 or at any age above 64. Our results are qualitatively similar using these alternatives.

Panel A of Table 4 shows the frequency of board representation activities initiated by block acquirers. We find that 62% of PE acquirers appoint representatives onto the target's board. In comparison, the corresponding number for non-PE acquirers is only 28%. Thus, PE acquirers are more than twice as likely as non-PE acquirers to appoint their representatives onto the target's board. Similarly, the board representation ratio of block acquirers on the target's board (number of target directors appointed by acquirers / total number of directors on the target's board) is higher for PE acquisitions than for non-PE acquisitions (16% versus 7%). These differences in the frequency of board representation and the board representation ratio between PE and non-PE acquisitions are significant at the 1% level.

In Panel B of Table 4, we examine the frequency of nonroutine top executive turnover in targets. We find that targets acquired by PE funds are more likely to experience nonroutine top executive turnover than those acquired by non-PE funds, irrespective of whether the turnover is measured during the holding period of block ownership (36% versus 26%) or for up to three years after the block share purchase (45% versus 34%). These differences in turnover rates between PE and non-PE acquisitions are significant at the 5% or better, indicating that PE acquirers are more likely to perform a disciplinary role than non-PE acquirers.

In sum, the results in Panels A and B of Table 4 suggest that PE acquirers are more actively involved in the internal governance of targets than are non-PE acquirers.

In Panel C of Table 4, we examine the frequency of target CEO/chairman appointments by the acquirers. We find that PE acquirers are three times as likely to appoint a target CEO/chairman as are non-PE acquirers (16% versus 6%), suggesting that PE acquirers engage in top management succession activities in their targets more actively than do non-PE acquirers.[15]

[15] Including the president in the analysis does not change the results reported in Panel C of Table 4.

4.2. Operational Engineering

We measure the operational engineering changes that block acquirers apply to their targets using the past work experience of directors appointed by block acquirers onto the target's board. Similar to Khorana, Tufano, and Wedge (2007), we limit our attention to two kinds of director experience: finance expertise and target industry experience. Specifically, we consider an acquirer-appointed director to have finance expertise if: (1) the director has been an officer in a financial services company with a position higher than or equivalent to vice president or director, including the general partner of a private investment firm, or (2) the director has been a CFO or a treasurer in any company. We consider a director to have target industry expertise if: (1) the director has worked for other companies in the same two-digit SIC industry as the target, or (2) the director has been a board member of such companies. We obtain information on directors' previous work experience from proxy statements and annual reports.

Table 5 presents summary statistics on past work experience of directors appointed by block acquirers (Panel A) and their board committee assignments (Panel B). Panel A shows that the directors appointed by PE acquirers are more likely to have finance experience (47%) than those appointed by non-PE acquirers (16%). The difference in the proportion of directors with finance experience between these two groups is statistically significant at the 1% level. However, the proportion of the acquirer-appointed directors with the same industry experience is not significantly different between PE and non-PE acquisitions (31% versus 30%).

Panel B shows that PE acquirer-appointed directors are more likely to sit on board committees such as compensation, executive, nominating, and stock option committees than non-PE acquirer-appointed directors.[16] Klein (1998) classifies directors' committee assignments into two groups: committees that

[16] In Panel B of Table 5, the number of directors designated by block acquirers is relatively small for the stock option committee because in most of our sample targets, the stock option committee operates as a part of the

perform a monitoring role (audit, compensation, and nominating/corporate governance committees) and committees that perform an advisory role (executive, investment, and finance committees). Thus, it appears that PE acquirer-appointed board members are more likely to sit on monitoring and advisory committees than non-PE acquirer-appointed board members, implying that their monitoring capabilities as well as their advisory services can be an important channel through which PE funds can create value for their portfolio companies.[17]

4.3. Financial Engineering

To examine whether the financial engineering changes that acquirers bring to their portfolio companies are different between PE and non-PE acquisitions, we focus on post-acquisition changes in target management ownership, target CEO compensation, and target leverage, all measured by over year -1 to year +3.

Panel A of Table 6 reports the changes in target top management (officers and directors) equity ownership. We find that management ownership in PE targets increases after the acquisition of block ownership: the mean and median ownership changes are, respectively, 2.3% and 0.4%, both of which are significant at the 5% level. In contrast, the corresponding mean and median ownership changes for non-PE targets are -1.4% and -1.0%, of which the median ownership change is significant at the 5% level. The differences in mean and median management ownership changes between the two groups are statistically significant at the 1% level. To the extent that high management ownership results in

compensation committee, not as an independent committee. We count the number of directors in the stock option committee only if this committee operates as an independent committee.

[17] In unreported tests, we find that conditional on a director having industry experience in the target's industry, PE directors are more likely to sit on board committees than non-PE directors. Moreover, the results from cross-sectional regressions (Table 11) show that when the targets experience poor operating performance or have complex operations such as multiple segments and high R&D intensity, PE acquirers are more likely to place representatives with industry expertise on these targets' boards. These findings suggest that although PE and non-PE acquirers are equally likely to designate representatives with relevant operational experience on target's board, PE acquirers are more likely to do so when targets have greater monitoring and advisory needs.

improved managerial incentives by aligning managerial and shareholder interests, these results are consistent with the financial engineering view of PE investments.

Panel B of Table 6 reports the changes in target CEO compensation. We use *Execucomp* to estimate the changes in target CEO compensation. To account for differences in CEO compensation across different industries, we adjust the change in a target's raw CEO compensation by subtracting the median change in industry CEO compensation. The first row in Panel B shows that the industry-adjusted change in the fixed portion of target CEO compensation, measured by CEO salary divided by total CEO compensation, is statistically insignificant for both PE and non-PE acquisitions.

We also find that for PE acquisitions, while the industry-adjusted mean and median changes in the proportion of options granted to the CEO in total CEO compensation are insignificantly positive, the industry-adjusted median change in the proportion of options plus stock awarded to the CEO in total CEO compensation is positive and significant. Specifically, when we use the option value estimated by the Black-Scholes model (reported option value), the industry-adjusted median change in the ratio of options plus stock awarded to the CEO to total CEO compensation in PE acquisitions is a significant 0.446 (0.493). In comparison, the corresponding median change in non-PE acquisitions is a significant -0.144 (-0.132). To the extent that the top management's pay-for-performance sensitivity is more likely to be driven by incentive-based compensation such as option grants and stock awards (Jensen and Murphy, 1990; Murphy, 1999; Hall and Liebman, 1998), these results suggest that PE acquirers are more likely to implement a compensation system that incentivizes target managers to work in shareholders' best interests than are non-PE acquirers.

Panel C of Table 6 shows the change in short-term and long-term leverage ratios. PE targets display positive but insignificant changes in short-term and long-term leverage ratios, while non-PE targets display significantly positive changes in these ratios. The differences in leverage ratios between the two groups, however, are not statistically significant.

5. Sources of Value Creation in PE Block Acquisitions

In this section we examine targets' acquisition announcement returns and post-acquisition operating performance to assess whether the governance, operational, and financial engineering changes that we identify in the previous section can explain the value creation in PE funds' block acquisitions.

5.1. Announcement Effects

To examine the valuation effect of acquisition announcements, we compute targets' abnormal returns using standard event study methodology. We obtain our estimates of the market model by using 200 trading days of return data, beginning 220 days before and ending 21 days before the announcement of the block share purchase, and we use the CRSP equally weighted return as the market return. We then sum the daily abnormal returns to get the cumulative abnormal return (CAR) from day t_1 before the announcement date to day t_2 after the announcement date of the block share purchase.

Panel A of Table 7 reports the CARs for the targets acquired by PE and non-PE funds for several different event windows. Target firms in both types of acquisition earn positive mean and median CARs irrespective of the event window we consider, all of which are statistically significant at the 1% level. These findings are consistent with Mikkelson and Ruback (1985), who document positive announcement returns for targets that sell 5% or more of their equity to outside investors. The median CARs for targets in PE acquisitions are consistently higher than those for targets in non-PE acquisitions across all event windows. The differences in median CARs between the two groups are significant for all event windows that we consider except for the CAR (-1, 1).

In Panel B of Table 7, we report the CAR (-5, 5) classified according to whether the acquirers appoint representatives onto a target's board. Targets with PE acquirer-appointed directors have a mean CAR of 18.8% and a median CAR of 14.5%, while the corresponding mean and median CARs for targets with non-PE acquirer-appointed directors are 13.3% and 8.0%, respectively. The difference in median CARs between the two groups is significant at the 5% level.

The panel also shows that among targets in PE (non-PE) acquisitions, targets with PE acquirer-appointed (non-PE acquirer-appointed) directors have a significantly higher median (mean) CAR than targets without PE acquirer-appointed (non-PE acquirer-appointed) directors. Thus, targets realize higher announcement returns when acquirers place their representatives on a target's board, and this effect is more pronounced when the directors are appointed by PE acquirers. These results suggest that the governance and/or operational engineering changes that PE acquirers apply to their targets can be an importance source of value gains in PE funds' block acquisitions.

In Panel C of Table 7, we divide the subsample of targets with acquirer-appointed directors according to whether the directors have finance experience and examine whether their finance expertise can help explain the target returns. We find that within the subsample of targets that have acquirer-appointed directors with finance experience, targets acquired by PE funds have significantly higher mean and median CARs (20.6% and 13.8%) than those acquired by non-PE funds (9.4% and 6.0%). The comparison of other groups, however, does not show any significant difference.

In Panel D of Table 7, we repeat the analysis in Panel C using the acquirer-appointed directors' experience in the target's industry as a measure of operating expertise. The results mirror those in Panel C. Specifically, when PE (non-PE) acquirers appoint representatives with experience in the target's industry onto the target's board, targets realize the mean and median CARs of 28.7% (14.3%) and 19.9% (5.5%), respectively.

Taken as a whole, the results in Panels C and D of Table 7 suggest that operational engineering changes that PE acquirers apply to their targets are an important source of value gains in PE minority equity investments.

In Panels E and F of Table 7, we classify our sample targets according to the median change in management equity ownership from year -1 to year +3 and the median change in industry-adjusted leverage ratio from year -1 to year +3, respectively. We find that within the subsample of targets that observe a high change in industry-adjusted leverage ratio, the targets acquired by PE funds have significantly higher mean and median CARs (15.2% and 10.9%) than those acquired by non-PE funds (8.7% and 6.1%). However, we find little evidence of a significance difference in CARs between targets of PE and non-PE acquirers when we partition the sample according to the median change in management equity ownership. Overall, these results weakly support the financial engineering view of PE minority equity investments.[18]

To better understand the cross-sectional variation in target returns, we perform multivariate regressions using CAR (-5, 5) as the dependent variable. We use as key explanatory variables an indicator variable for PE acquisitions, several measures for the governance, financial, and operational engineering changes that acquirers apply to their targets, and interaction terms between the PE acquirer indicator variable and these change measures. The regressions also include as transaction characteristics the duration of block ownership (an indicator variable that equals one if the holding period of block shares is longer than three years), the percent of shares acquired (the sum of the percent of shares acquired at the transaction date and the percent of additional shares acquired up to the

[18] Since the change in the proportion of stock and options awarded to the CEO in total CEO compensation for targets in PE acquisitions is always above the sample median, we are not able to use this change variable to examine whether targets with a higher change experience higher announcement returns than those with a lower change.

three years after the transaction date),[19] and the degree of industrial relatedness between the acquirer and the target (an indicator variable that equals one if the acquirer and the target are in the same two-digit SIC industry). We include the duration of block ownership in the regressions since Demsetz and Lehn (1985) argue that as long-term investors, large shareholders have strong incentives to monitor management, suggesting that the holding period of block ownership can be positively related to target value. The regressions also include the percent of shares acquired since Shleifer and Vishny (1986) argue that as the size of equity ownership by large shareholders increases, their optimal choice of monitoring level increases. Finally, we control for the industrial relatedness between the acquirer and the target since the possibility of increasing economies of scale is likely to be greater when the acquirer and the target operate in the same industry.

We also include as control variables target financial characteristics such as prior stock return performance, prior operating performance, size (log of book value of total assets), leverage, and Tobin's *q*. Industry and year indicator variables are also included in all regression equations to control for potential industry and time trends effects, respectively.

Table 8 reports the regression results. All regressions are estimated using ordinary least squares (OLS). In the first regression, we include the PE acquirer indicator variable, transaction and target characteristic variables, and industry and year indicator variables. The coefficient estimate on the PE acquirer indicator variable is 0.045 with a *p*-value of 0.08. This result shows that, all else equal, targets acquired by PE funds realize 4.5% higher abnormal announcement returns than targets acquired by non-PE funds.

In regression (2), we replace the PE acquirer indicator variable with an indicator variable that equals one if acquirers appoint their representatives onto the target's board and zero otherwise. The coefficient estimate on this board representation indicator variable is 0.031, significant at the 10% level.

[19] In untabulated tests, we also experiment with the percent of shares acquired at the transaction date and obtain the qualitatively similar results as those reported in the paper.

Thus, all else equal, targets with acquirer-appointed directors realize 3.1% higher abnormal announcement returns than other targets, suggesting that outside directors as large shareholder add value to targets.

To examine the source of the value creation in PE block acquisitions, in regression (3) we include interaction terms between the PE acquirer indicator variable and the indicator variable that equals one if the acquirers appoint representatives with experience in the target's industry onto the target's board, and between the PE acquirer indicator variable and the indicator variable that equals one if the acquirers appoint representatives with finance experience onto the target's board. While the coefficient estimates on both interaction terms are positive and economically significant (0.104 and 0.063, respectively), only the coefficient estimate on the former interaction term is statistically significant at the 10% level. Thus, the value creation in PE acquisitions is likely to be particularly evident when PE acquirer-appointed directors can bring industry expertise to target's management/operation.

In regression (4), we include an indicator variable that equals one if the target ROA is in the bottom 25% of the sample and the interaction between this indicator variable and the PE acquirer indicator. The coefficient estimate on the interaction term is 0.135 with a *p*-value of 0.02, indicating that all else equal, poorly performing PE targets realize 13.5% higher abnormal announcement returns than other targets.

In regression (5), we replace target ROA in the previous regression with target profit margin. The coefficient estimate on the interaction term is again positive (0.124) and significant at the 5% level. To the extent that managers of poorly performing firms have higher agency problems and greater advisory needs, these results suggest that the value creation in PE acquisitions is particularly pronounced when the monitoring and/or advisory roles of PE acquirers are more likely to be valuable.

Targets with higher R&D intensity tend to have greater information asymmetry and more complex operations. To the extent that these targets have greater advisory needs and hence PE acquirers'

advisory function is particularly valuable, we expect value creation in PE block acquisitions to be larger for targets with higher R&D intensity than for those with lower R&D intensity. To test this conjecture, in regression (6) we include an indicator variable that equals one if the ratio of target R&D expenditures to total sales is in the top 25% of the sample and an interaction term between this indicator variable and the PE acquirer indicator variable. We find that the coefficient estimate on the interaction term is positive and significant at the 5% level. Thus, PE acquirers appear to create more value when they can bring valuable expertise to portfolio companies that have greater advisory needs.

In regression (7), we include an indicator variable that equals one if the acquirers appoint a representative to be the target's CEO/chairman and zero otherwise and the interaction between this variable and the PE acquirer indicator variable. The interaction term has a coefficient of 18.9%, significant at the 1% level, suggesting that new top management from PE acquirers add value to targets, possibly due to the experience and expertise that the new management can bring to targets.

Overall, the results above indicate that the governance and operational engineering changes that PE acquirers apply to their targets are important sources of value gains in PE minority equity investments.

In regressions (8), (9), and (10), we examine the importance of financial engineering changes in explaining target returns by including as independent variables the change in target management ownership, the change in the target's leverage ratio, and the change in the incentive-based component of the target CEO's compensation (i.e., options plus stock awarded to the CEO / total CEO compensation). The results show that none of the coefficient estimates on these variables is statistically significant. In unreported tests we also include the interactions terms between the PE indicator variable and these change variables, but we find that they are not significantly associated with target returns.

5.2. Post-Acquisition Operating Performance

In this section we use the change in target operating performance following the acquisition of block ownership as the measure of value creation in block share acquisitions. Table 9 reports raw and industry-adjusted percentage changes in target operating performance from two years before the block acquisitions (year -2) to one year before the block acquisitions (year -1) and from year -1 to one year (year +1), two years (year +2), and three years (year +3) after the block acquisition for several subgroups. Following Brav et al. (2008) and Guo, Hotchkiss, and Song (2011), we measure operating performance as the ratio of operating income (EBITDA) to total sales. Industry-adjusted operating performance is estimated by subtracting the median four-digit SIC industry operating performance from each firm's raw operating performance.[20] Since our sample firms' operating performance is highly skewed (the raw change in operating performance has skewness less than -28), we use the median change in operating performance as our key statistic.

We find that while the targets of non-PE acquirers have insignificant median changes in raw and industry-adjusted operating performance for all time intervals considered, the targets of PE acquirers have a significant median change in industry-adjusted operating performance from year -1 to year +3 of 2.47%.

Table 9 also shows that for targets with board representation by PE acquirers, the median changes in both raw and industry-adjusted operating performance from year -1 to year + 2 and from year -1 to year +3 are positive and significant at the 10% level, whereas for targets without board representation by PE acquirers, the corresponding median changes are not significant. These results suggest that the directors appointed by PE acquirers onto the target's board play an important role in improving the operating performance of target firms.

[20] In untabulated tests, we also estimate industry-adjusted operating performance by subtracting the matching firm's operating performance from the target firm's raw operating performance. Specifically, following Lie (2001), Grullon and Michaely (2004), and Guo, Hotchkiss, and Song (2011), we choose as the matching firm the firm that resembles the target firm the most in terms of the level of operating performance in year -1, the change in operating performance in year -1, the level of market-to-book in year -1, and industry (same four-digit SIC). We find that our results are qualitatively unchanged.

To gain further insight into the role of the directors appointed by PE acquirers, we examine whether these directors' past work experience and expertise are related to target operating performance. We find that targets with a PE director with experience in their industry observe a median change in raw (industry-adjusted) operating performance from year -1 to year +2 of 12.9% (23.88%) and a corresponding change in operating performance from year -1 to year +3 of 22.72% (30.37%), all of which are significant at the 5% level or better. Therefore, the effect of a PE director's industry expertise on target operating performance seems to be both statistically and economically significant, suggesting that the industry-specific knowledge that PE acquirers bring to target operations constitutes an important source of value creation in PE minority equity investments. However, the corresponding median changes for targets with a PE director that has finance experience are not significant.

When we classify the targets of PE acquirers according to the sample median change in target management ownership from year -1 to year +3, we find that the changes in industry-adjusted operating performance for targets with low management ownership changes are statistically insignificant for all time intervals considered. Although the changes in industry-adjusted operating performance for targets with high management ownership changes are also generally insignificant, the performance change from year -1 to year +3 is positive and significant, suggesting that improved managerial incentives, albeit weak, are an important source of value creation in PE minority equity investments.

Finally, as a further test of the financial engineering view of PE investments, we divide the targets of PE acquirers according to the sample median change in target leverage ratio. We find no significant changes in operating performance for targets with both high and low leverage changes.

It is worth noting that raw and industry-adjusted changes in target operating performance from year -2 to year -1 are statistically insignificant for both PE and non-PE targets irrespective of how we divide the sample targets into subgroups. In untabulated tests, we find that the differences in raw (industry-

adjusted) changes in operating performance from year -2 to year -1 between PE and non-PE targets are not statistically significant. The results are similar for raw and industry-adjusted changes in operating performance from year -5 to year -1. These results indicate that PE targets are not underperforming firms prior to the acquisitions and thus post-acquisition operating performance improvement in PE targets is not likely to be driven by PE acquirers' ability to choose underperforming firms due to their superior information.

Table 10 reports the regression results using the change in target industry-adjusted operating performance from year -1 to year +3 as the dependent variable. Since our long-term profitability measure is highly skewed, we use median regression instead of OLS to determine the sources of value creation in block share acquisitions.

We find that the results for the changes in post-acquisition operating performance in Table 10 are qualitatively similar to those for abnormal announcement returns in Table 8. The coefficient estimates on most of the interaction terms between the PE acquirer indicator variable and indicator variables that measure governance and operational engineering changes are significant and have the same signs as in Table 8. Specifically, we find that the targets of PE acquirers realize better post-acquisition operating performance than do other targets if: 1) their acquirers appoint representatives with experience in their industries onto their boards, 2) they perform poorly, and 3) they have higher R&D intensity. Similar to the results reported in Table 8, we find that none of the coefficients estimates on variables that measure financial engineering changes is statistically significant.

6. Determinants of Board Representation and CEO Turnover

The results so far suggest that PE acquirers' representation on the target's board and PE acquirer-appointed directors' industry-specific expertise are key channels through which PE acquirers can create value in their portfolio companies. To provide more convincing evidence on these results, in this

section we examine the factors that determine PE acquirers' representation on the target's board, and we examine whether the directors appointed by PE acquirers onto the target's board play an important role in targets' nonroutine top executive turnover.

6.1. Determinants of Board Representation

To examine the determinants of board representation by block share acquirers in targets, we perform multivariate tobit regressions using the board representation ratio as the dependent variable.[21] We use the variables that measure the extent to which the targets need monitoring and/or advice as key explanatory variables.

Table 11 reports the regression results. The first two regressions use the ratio of the number of directors on the target's board appointed by acquirers to the total number of directors on the target's board as the dependent variable. In regression (1), the PE acquirer indicator variable has a statistically significant coefficient of 0.25, indicating that board representation by acquirers is greater in PE acquisitions than in non-PE acquisitions. We also find that the coefficient estimate on target size (leverage) is negative (positive), significant at the 1% level, suggesting that blockholders are more likely to have representatives on the target's board when the target is smaller (more levered).

In regression (2), the coefficient estimates on both the percent of shares acquired and the indicator variable for the duration of block ownership are positive and significant, supporting, respectively, Shleifer and Vishny's (1986) argument on the monitoring role of large shareholders and Demsetz and Lehn's (1985) argument on the monitoring role of long-term blockholders.

In regressions (3) and (4), we use the number of acquirer-appointed directors with finance experience as the numerator in calculating the board representation ratio. Our key explanatory

[21] In untabulated tests, we also estimate the regressions using a least squares model and a general linear model for fractional response. The results using these approaches are similar to those using the tobit regression in terms of their statistical significance and conditional marginal effects.

variables are the interaction between the PE acquirer indicator variable and an indicator variable for poor past stock return performance (equals one if prior industry-adjusted target stock performance is in the bottom 25% of the sample) and the interaction between the PE acquirer indicator variable and an indicator variable for high free cash flow problems (equals one if the ratio of the target's cash flow to total assets is above the sample median and its Tobin's *q* is below the sample median). These interaction terms are included to examine whether, when target agency problems are higher, PE acquirers are more likely to appoint a representative with finance experience onto the target's board than non-PE acquirers. The coefficient estimates on both interaction terms are positive and significant at the 5% level, indicating that PE acquirers engage in more active monitoring of target management when the need for target oversight is greater.

In regressions (5) through (8), we use the number of acquirer-appointed directors with experience in the target's industry as the numerator in calculating the board representation ratio. In regressions (5) and (6), we include as explanatory variables two interaction terms that measure the difference in monitoring/advisory needs of targets between PE and non-PE acquisitions: the interaction between the PE acquirer indicator variable and an indicator variable that equals one if prior target operating performance is in the bottom 25% of the sample and the interaction between the PE acquirer indicator variable and an indicator variable that equals one if the target's profit margin is in the bottom 25% of the sample. We find that the coefficient estimates on both interaction terms are positive and significant, suggesting that PE block acquirers are more likely to appoint representatives with experience in the target's industry onto the target's board when the target has greater needs for operational improvement.

In regressions (7) and (8), we replace the indicator variables for target operating performance included in the interaction terms used in regressions (5) and (6) with indicator variables for high R&D intensity (equals one if the ratio of target R&D expenditures to total sales is in the top 25% of the sample) and for multiple segments (equals one if the target has multiple segments), respectively. We

find that these two interaction terms are significantly positively related to the board representation ratio. Thus, PE acquirers are more likely to appoint representatives with experience in the target's industry onto the target's board when the target has greater advisory needs with respect to its complex operations.

Overall, these results, together with those in Tables 8 and 10, suggest that PE funds use their governance and operational expertise to create value in their portfolio companies and that board representation plays an instrumental role in creating such value, supporting the governance and operational engineering views of PE minority equity investments.

6.2. Likelihood of Nonroutine Top Management Turnover

Table 12 presents the results of logistic regressions in which the dependent variable equals one if a nonroutine top management turnover event occurs in the target during the acquirer's block ownership holding period up to three years after the block share purchase and zero otherwise. In addition to including all explanatory variables used in the previous regressions, we also control for variables that may affect top executive turnover. Specifically, the regressions control for the age and tenure of the top executive, as well as a founder indicator variable, which equals one if the top executive is the founder of the firm. We define founders as those top executives who are described as founders in the proxy statement or annual statement, or those who have held the position of top executive since the inception of the firm.

In regression (1), we include prior four-digit SIC industry-adjusted stock returns as a key explanatory variable. Consistent with evidence from previous studies, we find that the coefficient estimate on this performance variable is negative and significant, suggesting that poor performance increases the likelihood of nonroutine top executive turnover in targets.

In regression (2), we include the interaction between prior stock performance and the PE acquirer indicator variable. We find that the coefficient estimate on this interaction term is negative but statistically insignificant, indicating that the sensitivity of top executive turnover to performance is statistically indistinguishable between targets of PE acquirers and those of non-PE acquirers.

In the next three regressions, we include the interaction terms between prior stock performance and the indicator variables for PE acquirer-appointed directors' past work experience. In regressions (3) and (5), we find that the interaction term including an indicator variable for PE acquirer-appointed directors with finance experience is significantly negatively related to the likelihood of nonroutine top management turnover, indicating that the negative relation between turnover and performance is stronger when the PE acquirer has representatives with financial expertise on the target's board. However, in regressions (4) and (5), the coefficient estimate on the interaction term that includes the indicator for PE acquirer-appointed directors with experience in the target's industry is not significant.

Overall, the results in Table 12 suggest that PE funds play an important role in monitoring poorly performing target management, particularly when their representatives on the target's board have finance expertise, further supporting the view that the governance engineering changes that PE funds initiate in their portfolio companies is an important channel through which PE funds exert influence over these companies.

7. Additional Tests

To verify the robustness of the results above, we conduct three additional tests. Below, we briefly summarize the results of these tests.

7.1. Endogeneity of Target Selection

Thus far, we have treated the acquirer's target selection as exogenous to the likelihood of board representation (top executive turnover) by acquirers. However, in interpreting our regression results, we must take into account the self-selection issue, i.e., our results may simply reflect PE and non-PE acquirers' different ability to select targets. Our results show that among targets of PE acquisitions, particularly those whose boards have representatives from PE acquirers, realize both higher abnormal announcement returns and better post-acquisition operating performance than do targets in other types of acquisitions, which suggests that post-acquisition activities by PE acquirers constitutes important sources of value creation in PE acquisitions. However, these results may also suggest that PE acquirers seeking to improve target governance are more likely to purchase targets with more pronounced agency problems, while non-PE acquirers do not show such a tendency. In this case, our results could be due to the quality of a target's corporate governance rather than PE acquirers' governance ability per se. To the extent that these self-selection biases exist, the coefficient estimates from the tests in Tables 11 and 12 are likely to be biased and inconsistent. We address the self-selection issue in several ways.

First, to distinguish ex-ante acquirers that are governance oriented from acquirers that are not, we compare the frequency of control-motivated acquisitions, that is, acquisitions in which the acquiring firm discloses in a 13D filing that it seeks control of the target. As shown in Panel C of Table 3, the frequency of control-motivated deals in PE acquisitions is statistically indistinguishable from that of control-motivated deals in non-PE acquisitions. Thus, it appears that PE acquirers are not significantly different from non-PE acquirers in terms of their ex-ante governance incentives.

Second, we examine whether the need for corporate governance activism in targets is different between targets of PE acquirers and targets of non-PE acquirers. If acquirers purchase targets that require less governance activism, then they might have fewer incentives to engage in post-acquisition governance in these targets. However, as Table 2 shows, pre-acquisition operating and stock

performance are not significantly different between PE and non-PE acquisitions. We also find that the extent of free cash flow problems (as indicated by a dummy variable that equals one if the ratio of cash flow to total assets is above the sample median and Tobin's q is below the sample median, and zero otherwise) is not significantly different between the two groups. These results suggest that, in general, the need for corporate governance activism in targets of PE acquirers is not different from that in targets of non-PE acquirers.

Third, to econometrically account for the endogeneity of target selection, we estimate our previous regressions in Tables 11 and 12 using the following two-stage self-selection model, which is based on Heckman's (1979):[22]

First-stage probit regression: (selection equation)

$$\Pr\left(Selection_{it} = 1 | IV, Control\right) = \Phi(\alpha_0 + \alpha_1 IV_{it} + \vec{\alpha}_2 Control_{it}) \quad (1)$$

Second-stage regression: (outcome equation)

$$Dependent\ Variable_{it} = \beta_0 + \beta_1 Selection_{it} + \beta_2 Key_{it} + \beta_3 Selection_{it} \times Key_{it} + \vec{\beta}_4 Control_{it} + \delta\lambda + \epsilon_{it} \quad (2)$$

where selection indicator is an endogenous dummy variable that equals one if the observation is "treated". In our case, this indicator is either a PE dummy or a dummy variable that takes the value of one if the target is purchased by a PE acquirer who appoints its representatives onto the target's board. *IV* is an instrumental variable, which is the number of PE deals in a 4-digit SIC industry from year -5 to year 0 (announcement year) excluding the sample deal itself divided by the number of

[22] Previous papers that use the self-selection model include Campa and Kedia (2002) and Chemmanur, Krishnan, and Nandy (2011). For a detailed discussion of the self-selection model that extends Heckman's (1979) two-stage estimation procedure, see Prabhala and Li (2007). Our method is close to Campa and Kedia (2002).

publicly listed firms in the same 4-digit SIC industry in Compustat in year 0;[23] *Control* is a vector of the other explanatory variables used in Table 11 (12); and *Key* is an exogenous firm and board characteristic variable used in the interaction term involving a *PE* dummy variable in Table 11 (12). λ is the sum of λ_1 and λ_2, where λ_1 is the inverse Mills ratio for PE acquirers ($= \frac{\phi(\hat{\alpha}_0+\hat{\alpha}_1 IV_{it}+Control_{it}\hat{\vec{\alpha}_2})}{\Phi(\hat{\alpha}_0+\hat{\alpha}_1 IV_{it}+Control_{it}\hat{\vec{\alpha}_2})} \times PE_{it}$) and λ_2 is the inverse Mills ratio for non-PE acquirers ($= \frac{-\phi(\hat{\alpha}_0+\hat{\alpha}_1 IV_{it}+Control_{it}\hat{\vec{\alpha}_2})}{1-\Phi(\hat{\alpha}_0+\hat{\alpha}_1 IV_{it}+Control_{it}\hat{\vec{\alpha}_2})} \times (1-PE_{it})$). The functions ϕ and Φ in λ_1 and λ_2 are the probability density function and cumulative distribution function of the normal distribution, respectively.

Assuming that PE funds make their endogenous acquisition decision based on observable characteristics, the first-stage regression estimates the ex-ante probability of a firm being acquired by a PE fund. In the second-stage regression, the inverse Mills ratio term λ (Heckman correction terms) allow us to proxy for the correlation between the second-stage dependent variable and the unobserved determinants of the propensity of being acquired by PE funds and non-PE funds, respectively, and thus correct for the self-selection bias. This two-step estimation procedure therefore allows us to examine whether, conditioning on the probability of being acquired by a PE fund, a differential effect exists between being acquired by PE funds and non-PE funds.

Table 13 presents regression estimates for the outcome and selection equations for tests of the governance activities as measured by nonroutine top executive turnover and the board representation ratio, including the board representation ratios with finance and same industry experience.

[23] Peer firms' acquisition activities can influence those of other firms in the same industry. For example, Song and Walkling (2000) argue that acquisition attempt within an industry generates shock waves that cause firm specific reassessment of the acquisition probability for rivals of target firms (i.e., firms in the same industry as the target firm) and show that acquisition attempt for a target indeed increases the probability that its rival firms become targets of other firms. Therefore, to the extent that PE funds' acquisition activities affect inferences about the acquisition probability of other firms by PE funds in the same industry, our instrumental variable is expected to be positively correlated with an individual firm's likelihood of becoming the target of PE funds.

In regressions (1) through (5), we examine the effects of PE acquisitions on board representation activities after controlling for self-selection bias. Regression (1) shows the results from the first-stage probit selection regression. Consistent with our expectation, we find that *IV* is positively and significantly related to *PE*, the endogenous selection variable, which confirms the relevancy of our instrument variables. Regressions (2) through (5) report the estimates from the second-stage regressions that examine the relations between the board representation ratio and a target's monitoring and advising needs. Consistent with the results in Table 11, regression (2) shows that PE acquirers have higher tendency to appoint representatives into target boards after acquisitions, even controlling for the selection effect. Moreover, PE acquirers are more likely to appoint a representative with finance experience onto the target's board than non-PE acquirers when the target has greater monitoring needs, that is, higher free cash flow problem (regression (3)). PE acquirers are also more likely to appoint representatives with experience in the target's industry onto the target's board when the target has greater advisory needs, that is, more complex operations as measured by higher R&D intensity and multiple segment (regressions (4) and (5)).

In regressions (6) and (7), we estimate the effects of PE acquisitions on nonroutine top executive turnover after controlling for self-selection bias. The first stage results in regression (6) show that *IV* is positively and significantly related to a selection indicator, which takes the value of one if the PE acquirer appoints its representatives with finance experience onto the target's board.[24] Regression (7) reports the estimates from the second-stage regressions. The coefficient on the interaction between past stock performance and the indicator for PE acquirer-appointed directors with finance experience is negative and significant. This result is consistent with those in regression (5) of Table 12 and indicates

[24] We acknowledge that to the extent that PE-appointed directors' finance experience is an endogenous variable, peer firms' acquisition activities may not be a good instrument for a selection indicator used in regression (6). For a robustness test, we estimate the first-stage regression using the same Heckman procedure without *IV* and find that the coefficient estimate on the key interaction variable (indicator for PE-appointed directors with finance experience * prior stock return) in the second-stage regression is more economically and statistically significant.

that the sensitivity of top executive turnover to performance is higher when the PE acquirer has representatives with financial expertise on the target's board.

Overall, our results from the second-stage regressions are generally consistent with those of previous tables, suggesting that self-selection bias is unlikely to affect our results.

7.2. Buyout versus Venture Capital Funds

As described in Section 3, our sample of PE acquirers consists of 66 acquirers with venture capital funds, 77 acquirers with buyout funds, and 22 acquirers with both buyout and venture capital funds. Although we treat both venture capital and buyout funds as PE funds, the two sets of firms might differ in that the former tends to invest in early-stage companies whereas the latter tends to invest in underperforming or undervalued companies that are more mature in their corporate lifecycle. These differences in investment strategy suggest that these two types of firms may have different motives for pursuing block share investments and thus different valuation effects. However, it is also possible that due to increased competition among PE funds with different types of funds, the lines between venture capital and buyout funds' investments have been blurred. For example, according to the Private Equity Council, in recent years venture capital funds have been investing more heavily in mature companies, while buyout funds have been investing in young companies.[25] Moreover, previous literature shows that both venture capital and buyout firms actively monitor their portfolio companies (Kaplan, 1991; Lerner, 1995; Strömberg, 2007; Hochberg, 2008). This blurring of the distinction between venture capital and buyout funds suggests that our key results should not differ between acquisitions made by venture capital funds and those made by buyout funds.

To address this issue, in untabulated tests we exclude 22 cases in which PE acquirers can be classified as both venture capital and buyout funds. We then examine whether targets' characteristics,

[25]Lerner, Sørensen, and Strömberg (2011) show that many buyout firms made some venture capital investments in the late 1990s.

abnormal announcement returns, and post-acquisition operating performance, as well as acquirer governance activities in targets (i.e., board representation and nonroutine CEO turnover), are different between acquisitions made by venture capital funds and those made by buyout funds. We find no statistically discernible differences in results between the two groups.

7.3. Event Window

In Table 8, we use CAR (-5, 5) as our key measure of announcement effects. In untabulated tests we re-estimate all regressions in Table 8 using the CARs estimated for longer event windows, such as CAR (-10, 10) and CAR (-20, 20), as the dependent variables. We find that the results are qualitatively similar to those using CAR (-5, 5).

8. Summary and Conclusion

Using a sample of 1,132 block share acquisitions in the U.S. during the 1990 to 2006 period, we examine the sources of value creation in PE minority equity investments. We find that PE acquirers purchase a larger percentage of target shares and hold these shares for a longer period of time than non-PE acquirers. PE acquirers are also more likely to place representatives on the target's board and their representatives are more likely to sit on various board committees in targets, such as compensation, executive, nominating, and stock option committees.

Moreover, we find that compared to non-PE acquirers, PE acquirers are more likely to appoint representatives with finance experience onto the target's board when targets perform poorly or have higher agency problems. These PE-appointed directors with finance experience also increase the likelihood of top executive turnover in targets with poor performance.

Finally, we find that the targets of PE acquirers, particularly those whose boards have representatives from the PE acquirers, experience both higher abnormal announcement returns and

better post-acquisition operating performance than targets of non-PE acquirers. These effects are more pronounced when PE acquirer-appointed directors have expertise in the target's industry, when they sit on the boards of poorly performing targets, and when they sit on the boards of targets with higher R&D intensity, suggesting that value creation in PE minority equity investments is closely related to PE funds' experience and expertise.

Overall, our findings suggest that the governance and operational engineering changes that PE acquirers apply to their targets are important sources of value gains in PE minority equity investments. Although our results using PE investors are generally consistent with previous studies on shareholder activism by other types of institutional investors, we show that compared to these institutional investors, PE funds take different approaches to value creation in their portfolio firms and thus they represent another important model for shareholder activists.

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Table 1
Distribution of Block Share Acquisition Activity by Acquirer Type, Year, and Target Industry

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund.

Panel A: Distribution of Block Share Acquisition Activity by Acquirer Type and Year

Year	Private Equity Acquisitions	Non-Private Equity Acquisitions	Total
1990	6	54	60
1991	2	52	54
1992	5	56	61
1993	4	48	52
1994	17	108	125
1995	20	120	140
1996	9	146	155
1997	8	107	115
1998	8	77	85
1999	10	75	85
2000	16	69	85
2001	7	21	28
2002	1	20	21
2003	4	15	19
2004	1	10	11
2005	1	17	18
2006	4	14	18
Total	123	1,009	1,132

Panel B: Distribution of Block Share Acquisition Activity by Acquirer Type and Target Industry

Target Industry (first two digits of the SIC code)	Private Equity Acquisitions	Non-Private Equity Acquisitions	Total
Agriculture, forestry, and fishing (01-09)	1	9	10
Mining and construction (10-17)	5	68	73
Manufacturing (20-39)	46	449	495
Transportation and public utilities (40-49)	13	45	58
Wholesale and retail trade (50-59)	13	109	122
Finance (60-69)	10	104	114
Services (70-89)	35	225	260
Total	123	1,009	1,132

Table 2
Descriptive Statistics for Targets

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Total N=1,132		Private Equity Acquisitions (A) N=123		Non-Private Equity Acquisitions (B) N=1,009		Test of Difference (A-B)	
Variables	Mean	Median	Mean	Median	Mean	Median	*t*-test	Wilcoxon Z-test
Book value of total assets (millions of dollar)	1785.182	84.055	766.579	140.867	1910.471	82.205	0.13	0.02**
Leverage (total debt / market value of equity plus book value of debt)	0.265	0.199	0.287	0.228	0.263	0.197	0.32	0.45
Operating income / total assets	-0.037	0.063	-0.059	0.087	-0.035	0.061	0.51	0.33
Prior stock return	-0.015	-0.065	-0.066	-0.131	-0.009	-0.058	0.41	0.25
Tobin's q (market value of equity plus book value of debt / book value of total assets)	1.796	1.105	1.84	1.229	1.787	1.087	0.76	0.06*
Free cash flow (indicator)	0.261	-	0.268	-	0.261	-	0.85	-
R&D expenditures / sales	4.827	0.044	2.958	0.039	5.046	0.045	0.52	0.47
Number of segments	2.340	1	2.439	1	2.328	1	0.65	0.06*

Table 3
Distribution of Block Share Acquisition Activity by Percent of Shares Acquired, Holding Periods, and Purposes of Acquisitions

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Percent of Shares Acquired

	Private Equity Acquisitions (A) N=123		Non-Private Equity Acquisitions (B) N=1,009		Test of Difference (A-B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon Z-test
Percent of shares acquired around the announcement date	0.154	0.117	0.124	0.082	0.00***	0.00***
Sum of the percent of shares acquired around the announcement date and the percent of additional shares that the acquirer purchased over the three years after the announcement date	0.205	0.147	0.150	0.089	0.00***	0.00***

Panel B: Distribution by Holding Periods of Block Ownership

	Private Equity Acquisitions (A) N=123	Non-Private Equity Acquisitions (B) N=1,009	Test of Difference (A-B)
Less than one year	18 (14%)	383 (38%)	0.00***
More than one but less than two years	27 (22%)	199 (20%)	0.56
More than two but less than three years	24 (20%)	119 (12%)	0.02**
More than three years	54 (44%)	308 (30%)	0.00***

Panel C: Distribution by Purposes of Acquisitions

	Private Equity Acquisitions (A) N=123	Non-Private Equity Acquisitions (B) N=1,009	Test of Difference (A-B)
Acquisitions with control purpose	17 (14%)	102 (10%)	0.21

Table 4
Governance Engineering Changes Applied by Block Share Acquirers: Frequency of Board Representation, Nonroutine Top Executive Turnover, New CEO / Chairman Designation Activities in Targets

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Frequency of Board Representation Activity in Targets by Block Share Acquirers

	Total	Private Equity Acquisitions (A)	Non-Private Equity Acquisitions (B)	Test of Difference (A-B)
	N=1,131	N=122	N=1,009	
Acquirers that have board representation on the target's board during the block ownership holding period (up to three years after the block share purchase)	359 (32%)	76 (62%)	283 (28%)	0.00***
Board representation ratio on the target's board by block acquirers (number of members of the board of directors appointed by acquirers / total number of members of the board of directors in target) during the block ownership holding period (up to three years after the block share purchase)	(8%)	(16%)	(7%)	0.00***

Panel B: Nonroutine Top Executive Turnover in Targets by Block Share Acquirers

	N = 1,071	N = 120	N = 951	
Targets that experience nonroutine top executive turnover during the block ownership holding period (up to three years after the block share purchase)	290 (27%)	43 (36%)	247 (26%)	0.02**
Targets that experience nonroutine top executive turnover for three years after the block shares purchase (regardless of acquirers' holding periods)	377 (35%)	54 (45%)	323 (34%)	0.01***

Panel C: New Target CEO / Chairman Designation by Block Share Acquirers

	N = 1,059	N = 120	N = 939	
Acquirers that designate their representatives as new target CEOs or chairmen	74 (7%)	19 (16%)	55 (6%)	0.00***

Table 5
Operational Engineering Changes Applied by Block Share Acquirers: Acquirer-Designated Directors' Past Work Experience and Their Board Committee Assignments

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Directors' Past Work Experience

	Total	Directors Designated by Private Equity Acquirers (A)	Directors Designated by Non-Private Equity Acquirers (B)	Test of Difference (A-B)
	N=640	N=154	N=486	
Director who has finance experience	153	73 (47%)	80 (16%)	0.00***
Director who has industry experience in the target's industry	194	47 (31%)	147 (30%)	0.95

Panel B: Directors' Board Committee Assignments

	Total	Directors Designated by Private Equity Acquirers (A)	Directors Designated by Non-Private Equity Acquirers (B)	Test of Difference (A-B)
	N=640	N=154	N=486	
Audit committee	125	37 (24%)	88 (18%)	0.11
Compensation committee	132	49 (32%)	83 (17%)	0.00***
Executive committee	74	32 (21%)	42 (9%)	0.00***
Nominating committee	58	32 (21%)	26 (5%)	0.00***
Stock option committee	22	12 (8%)	10 (2%)	0.00***

Table 6
Financial Engineering Changes Applied by Block Share Acquirers: Post-Acquisition Changes in Managerial Ownership, CEO Compensation, and Leverage Ratio in Targets from Year -1 to Year +3, Relative to the Acquisition Announcement Year (Year 0) of Block Ownership

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Change in Target Top Management (Officers and Directors) Equity Ownership

	Private Equity Acquisitions (A) N=79		Non-Private Equity Acquisitions (B) N=502		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Change in Top Management Equity Ownership	0.023**	0.004**	-0.014	-0.010**	0.01***	0.00***

Panel B: Change in Target CEO Compensation

	Private Equity Acquisitions (A) N=14		Non-Private Equity Acquisitions (B) N=104		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Salary / total compensation						
Raw change	-0.047	-0.092	-0.026	-0.018	0.86	0.68
Industry-adjusted change	0.003	-0.083	0.037	0.000	0.75	0.44
Options awarded (value estimated by the Black-Scholes model) / total compensation						
Raw change	0.196	0.133	-0.112**	-0.062**	0.06*	0.06*
Industry-adjusted change	0.291	0.144	-0.190***	-0.144***	0.02**	0.02**
Options awarded (reported value) / total compensation						
Raw change	0.281	0.142	-0.194***	-0.077**	0.03**	0.05*
Industry-adjusted change	0.291	0.144	-0.190***	-0.144***	0.02**	0.02**
Options (value estimated by the Black-Scholes model) and stock awards / total compensation						

Raw change	0.376*	0.302*	-0.104**	-0.071**	0.00***	0.01***
Industry-adjusted change	0.410	0.446*	-0.104**	-0.144***	0.00***	0.01***
Option (reported value) and stock awards / total compensation						
Raw change	0.450*	0.420*	-0.164***	-0.067**	0.02**	0.03**
Industry-adjusted change	0.476*	0.493*	-0.142**	-0.132**	0.01***	0.01***
Total Compensation						
Raw change	1.599***	0.496***	1.488	0.197	0.93	0.49
Industry-adjusted change	0.957	0.496	0.708	-0.225	0.87	0.66

Panel C: Change in Target Leverage Ratio

	Private Equity Acquisitions (A) N=86		Non-Private Equity Acquisitions (B) N=642		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Short-term leverage						
Raw change	0.019	0.000	0.062*	0.000	0.29	0.78
Industry-adjusted change	0.021	0.005	0.068*	0.003**	0.27	0.69
Long-term leverage						
Raw change	0.117	0.000	0.043**	0.000**	0.36	0.73
Industry-adjusted change	0.108	0.000	0.036**	0.004	0.37	0.86

Table 7
Cumulative Abnormal Returns (CARs) for Targets around the Announcement Date

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). We estimate the market model by using 200 trading days of return data ending 21 days before the acquisition announcement. We use the CRSP equally weighted return as a proxy for the market return. Numbers in brackets denote the number of observations. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. The numbers in the test-of-difference columns denote *p*-values. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: CARs around the Announcement Date

	Private Equity Acquisitions (A) [123]		Non-Private Equity Acquisitions (B) [1,009]		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
CAR (-1, 1)	0.104***	0.061***	0.079***	0.038***	0.34	0.14
CAR (-2, 2)	0.123***	0.059***	0.085***	0.045***	0.19	0.07*
CAR (-3, 3)	0.133***	0.080***	0.087***	0.047***	0.09*	0.03**
CAR (-5, 5)	0.153***	0.097***	0.099***	0.060***	0.08*	0.06*
CAR (-10, 10)	0.163***	0.124***	0.110***	0.070***	0.11	0.03**
CAR (-20, 20)	0.199***	0.112***	0.115***	0.086***	0.06*	0.09*

Panel B: CAR (-5, 5) Classified by Board Representation by Block Acquirers

	Private Equity Acquisitions (A)		Non-Private Equity Acquisitions (B)		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Acquirer has representatives on the target's board (A)	0.188***	0.145***	0.133***	0.080***	0.21	0.04**
	[76]		[283]			
Acquirer does not have representatives on the target's board (B)	0.098***	0.041**	0.086***	0.052***	0.74	0.67
	[47]		[724]			
Test of difference (A - B)						
t-test Wilcoxon *z*-test	0.11	0.02**	0.02**	0.11		

Panel C: CAR (-5, 5) Classified by Finance Experience of Directors Designated by Block Acquirers

	Private Equity Acquisitions (A)		Non-Private Equity Acquisitions (B)		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Acquirer designates directors with finance experience (A)	0.206***	0.138***	0.094***	0.060***	0.07*	0.04**
	[47]		[67]			
Acquirer designates directors without finance experience (B)	0.153***	0.175***	0.143***	0.086***	0.90	0.28
	[30]		[145]			

Test of difference (A - B)							
t-test	Wilcoxon *z*-test	0.52	0.94	0.23	0.35		

Panel D: CAR (-5, 5) Classified by Industry Experience of Directors Designated by Block Acquirers

	Private Equity Acquisitions (A)		Non-Private Equity Acquisitions (B)		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Acquirer designates directors with industry experience in the target's industry into the target's board (A)	0.287***	0.199***	0.143***	0.055***	0.12	0.00***
	[33]		[103]			
Acquirer designates directors without industry experience in the target's industry into the target's board(B)	0.113****	0.095***	0.113***	0.088***	0.98	0.71
	[40]		[108]			
Test of difference (A - B)						
t-test Wilcoxon *z*-test	0.05**	0.05**	0.53	0.26		

Panel E: CAR (-5, 5) Classified by the Change in Target Top Management Equity Ownership from Year -1 to Year +3, Relative to the Acquisition Announcement Year of Block Ownership

	Private Equity Acquisitions (A)		Non-Private Equity Acquisitions (B)		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Above sample median (A)	0.136***	0.090***	0.099***	0.067***	0.35	0.32
	[45]		[245]			
Below sample median (B)	0.126***	0.111***	0.110***	0.066***	0.67	0.21
	[34]		[256]			
Test of difference (A - B)						
t-test Wilcoxon *z*-test	0.85	0.78	0.62	0.89		

Panel F: CAR (-5, 5) Classified by the Change in Industry-Adjusted Target Leverage Ratio from Year -1 to Year +3, Relative to the Acquisition Announcement Year of Block Ownership

	Private Equity Acquisitions (A)		Non-Private Equity Acquisitions (B)		Test of Difference (A - B)	
	Mean	Median	Mean	Median	*t*-test	Wilcoxon *z*-test
Above sample median (A)	0.152***	0.109***	0.087***	0.061***	0.08*	0.05**
	[41]		[323]			
Below sample median (B)	0.183***	0.102***	0.112***	0.062***	0.33	0.24
	[45]		[319]			
Test of difference (A - B)						
t-test Wilcoxon *z*-test	0.69	0.90	0.24	0.47		

Table 8
OLS Regression of Cumulative Abnormal Returns (-5, 5) for Targets on Explanatory Variables

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). We compute abnormal returns using the market model. We estimate the market model by using 200 trading days of return data ending 21 days before the acquisition announcement. We use the CRSP equally weighted return as a proxy for the market return. The dependent variable is cumulative abnormal returns (-5, 5) for targets. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. *p*-values are in parentheses. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Private equity acquirer (indicator): a	0.045*		-0.002	0.009	0.012	0.014	0.026			
	(0.08)		(0.96)	(0.75)	(0.69)	(0.63)	(0.35)			
Acquirer has representatives on the target's board (indicator)		0.031*								
		(0.10)								
Acquirer has representatives with same industry experience on the target's board (indicator): b			0.039							
			(0.17)							
Acquirer has representatives with finance experience on the target's board (indicator): c			-0.012							
			(0.74)							
Operating income / total assets is in the bottom 25% of the sample (indicator): d				-0.015						
				(0.49)						
Profit margin is in the bottom 25% of the sample (indicator):e					-0.008					
					(0.73)					
R&D expenditures / sales is in the top 25% of the sample (indicator):f						0.021				
						(0.35)				
Acquirers designate a new target CEO or chairman (indicator):g							-0.048			
							(0.21)			
*a * b*			0.104*							
			(0.08)							
*a * c*			0.063							

			(0.30)							
*a * d*				0.135** (0.02)						
*a * e*					0.124** (0.03)					
*a * f*						0.123** (0.03)				
*a * g*							0.189*** (0.01)			
Change in top management equity ownership from year -1 to year +3								-0.066 (0.25)		
Change in leverage ratio from year -1 to year +3									-0.047 (0.63)	
Change in the proportion of option and stock awards in total CEO compensation from year -1 to year +3										-0.003 (0.94)
Prior stock return	-0.075*** (0.00)	-0.076*** (0.00)	-0.076*** (0.00)	-0.079*** (0.00)	-0.076*** (0.00)	-0.076*** (0.00)	-0.072*** (0.00)	-0.065*** (0.00)	-0.078*** (0.00)	-0.097 (0.12)
Operating income / total assets	-0.037 (0.13)	-0.038 (0.12)	-0.036 (0.14)		-0.009 (0.77)	-0.023 (0.37)	-0.042* (0.09)	-0.062 (0.10)	-0.378 (0.19)	-0.025 (0.87)
Log of book value of total assets	-0.011** (0.04)	-0.009* (0.07)	-0.009* (0.07)	-0.013*** (0.01)	-0.012** (0.02)	-0.011** (0.04)	-0.011** (0.03)	-0.009 (0.20)	-0.009* (0.08)	-0.029 (0.14)
Leverage (total debt / market value of equity plus book value of debt)	0.077** (0.03)	0.071* (0.05)	0.055 (0.15)	0.082** (0.03)	0.081** (0.03)	0.092** (0.01)	0.067* (0.07)	0.081* (0.10)	0.075** (0.04)	-0.027 (0.84)
Tobin's q (market value of equity plus book value of debt / book value of total assets)	-0.002 (0.61)	-0.002 (0.57)	-0.000 (0.95)	-0.000 (0.96)	-0.001 (0.82)	-0.003 (0.51)	-0.001 (0.86)	-0.000 (0.97)	-0.002 (0.63)	-0.014 (0.37)
Percent of shares acquired	0.055 (0.28)	0.031 (0.57)	0.027 (0.64)	0.055 (0.28)	0.062 (0.22)	0.058 (0.26)	0.056 (0.32)	0.001 (0.34)	0.072 (0.16)	-0.003 (0.20)

Holding period of block shares is longer than three years (indicator)	0.005 (0.79)	0.000 (1.00)	0.006 (0.76)	0.003 (0.85)	0.003 (0.85)	0.006 (0.74)	0.005 (0.79)	0.016 (0.49)	0.009 (0.60)	-0.037 (0.55)
Acquirer and target are in the same 2-digit industry (indicator)	0.023 (0.36)	0.017 (0.49)	-0.093 (0.25)	0.024 (0.34)	0.026 (0.30)	0.020 (0.42)	0.038 (0.15)	0.057 (0.59)	-0.085 (0.30)	0.256* (0.09)
Industry (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Year (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Intercept	0.083* (0.05)	0.080* (0.06)	0.098** (0.03)	0.098** (0.03)	0.089** (0.04)	0.075* (0.08)	0.101** (0.03)	0.053 (0.40)	0.079* (0.07)	0.448** (0.02)
Adjusted R^2	0.0954	0.0950	0.0989	0.0976	0.101	0.0996	0.101	0.104	0.090	0.0471
F-value	4.555***	4.538***	4.420***	4.536***	4.497***	4.509***	4.353***	3.133***	4.460***	1.228
No. of observations	1,080	1,080	1,022	1,080	1,057	1,080	1,011	569	1,084	77

Table 9
Median Changes in Post-Acquisition Operating Performance (EBITDA / Sales) of Targets

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Operating performance is measured as the ratio of operation income (EBITDA) to total sales. Industry-adjusted operating performance is estimated by subtracting the median four-digit SIC industry operating performance from each firm's raw operating performance. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. The first and second numbers in parentheses denote the number of total observations and the number of observations with positive operating performance, respectively. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

	Year -2 to Year -1	Year -1 to Year +1	Year -1 to Year +2	Year -1 to Year +3
By acquirer type (using a full sample):				
1) Non-Private equity acquisitions				
Raw change	-0.70% (922;411)	-0.42% (765;361)	-0.06% (685;340)	-0.21% (606;300)
Industry-adjusted change	-0.53% (919;428)	-0.60% (763;365)	-0.18% (683;337)	-0.01% (605;302)
2) Private equity acquisitions				
Raw change	-0.40% (107;50)	-0.47% (101;47)	1.26% (92;49)	0.58% (80;44)
Industry-adjusted change	-0.30% (107;53)	0.42% (101;51)	1.35% (92;49)	2.47%* (80;44)
By private equity acquirer' board representation (using a subsample of private equity acquisitions)				
1) without board representations				
Raw change	0.40% (39;20)	-0.47% (39;17)	-0.03% (37;18)	0.02% (29;15)
Industry-adjusted change	0.30% (39;22)	1.35% (39;20)	-1.71% (37;16)	0.24% (29;15)
2) with board representations				
Raw change	-0.85% (68;30)	-0.71% (62;30)	3.02%* (55;31)	2.41%* (51;29)
Industry-adjusted change	-0.76% (68;31)	0.00% (62;31)	2.59%* (55;33)	3.22%* (51;29)
By private equity acquirer-appointed directors' past work experience (using a subsample of private equity acquisitions):				
1) directors have industry experience in the target's industry				
Raw change	-4.02% (29;12)	-0.35% (23;11)	12.90%** (19;12)	22.72%** (19;11)
Industry-adjusted change	-0.53% (29;14)	8.01% (23;13)	23.88%*** (19;16)	30.37%** (19;13)

2) directors have finance experience				
Raw change	-0.32% (42;20)	-1.45% (39;17)	-0.38% (33;15)	-0.27% (30;14)
Industry-adjusted change	-0.21% (42;21)	-0.46% (39;19)	1.03% (33;18)	-2.89% (30;14)
By change in top management equity ownership from year -1 to year +3 (using a subsample of private equity acquisitions):				
1) above sample median				
Raw change	-0.68% (41;18)	-1.51% (40:19)	3.37% (37:20)	0.96% (34:19)
Industry-adjusted change	-1.03% (41;17)	-0.47% (40;19)	3.91% (37;21)	2.99%* (34;21)
2) below sample median				
Raw change	3.41%** (27;19)	-1.07% (31;13)	-0.04% (29;14)	0.11% (24;13)
Industry-adjusted change	2.37%* (27;18)	-0.46% (31`;14)	0.36% (29;15)	-0.29% (24;11)
By change in industry-adjusted leverage ratio from year -1 to year +3 (using a subsample of private equity acquisitions):				
1) above sample median				
Raw change	-0.29% (51;24)	2.08% (47;27)	3.37% (43;25)	2.65% (38;21)
Industry-adjusted change	-0.30% (51;25)	2.38% (47;27)	2.28% (46;23)	3.32% (38;21)
2) below sample median				
Raw change	-0.63% (55;25)	-1.75% (54;20)	-0.12% (49;24)	0.20% (43;23)
Industry-adjusted change	-0.49% (55;27)	-2.11% (54;24)	1.30% (49;26)	0.95% (43;23)

Table 10
Median Regression of Change in Industry-adjusted Post-Acquisition Operating Performance (EBITDA / Sales) of Targets on Explanatory Variable

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). The dependent variable is industry-adjusted operating performance (EBITDA/sales) for targets from year -1 to year +3, relative to the acquisition announcement year (year 0) of block ownership. The industry-adjusted operating performance is estimated by subtracting the median same 4-digit SIC industry operating performance from each firm's raw operating performance. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. *p*-values are in parentheses. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Private equity acquirer (indicator): a	0.039**		0.023	0.007	0.020	0.030			
	(0.03)		(0.36)	(0.78)	(0.46)	(0.29)			
Acquirer has representatives on the target's board (indicator)		0.040**							
		(0.02)							
PE acquirer has representatives with same industry experience on the target's board (indicator): b			0.034						
			(0.13)						
PE acquirer has representatives with finance experience on the target's board (indicator): c			0.003						
			(0.92)						
Operating income / total assets is in the bottom 25% of the sample (indicator): d				0.226***					
				(0.00)					
Profit margin is in the bottom 25% of the sample (indicator):e					0.085***				
					(0.00)				
R&D expenditures / sales is in the top 25% of the sample (indicator):f						-0.030			
						(0.21)			
*a * b*			0.170***						
			(0.00)						
*a * c*			0.025						
			(0.59)						
*a * d*				0.361***					
				(0.00)					
*a * e*					0.134***				
					(0.01)				
*a * f*						0.113**			
						(0.04)			

Change in top management equity ownership from year -1 to year +3							0.012 (0.79)		
Change in leverage ratio from year -1 to year +3								-0.000 (0.95)	
Change in the proportion of option and stock awards in total CEO compensation from year -1 to year +3									0.010 (0.85)
Prior stock performance	-0.003 (0.71)	-0.008 (0.43)	-0.004 (0.71)	0.005 (0.60)	-0.004 (0.69)	-0.004 (0.75)	-0.016 (0.23)	-0.001 (0.87)	0.108 (0.12)
Operating income / total assets	-0.536*** (0.00)	-0.546*** (0.00)	-0.530*** (0.00)		-0.428*** (0.00)	-0.528*** (0.00)	-0.761*** (0.00)	-0.553*** (0.00)	-0.976*** (0.00)
Log of book value of total assets	0.008** (0.05)	0.008* (0.09)	0.007* (0.07)	0.007 (0.11)	0.010** (0.04)	0.008 (0.10)	0.013** (0.01)	0.009*** (0.00)	0.006 (0.79)
Leverage (total debt / market value of equity plus book value of debt)	-0.066** (0.02)	-0.085** (0.01)	-0.068** (0.02)	-0.044 (0.16)	-0.076** (0.03)	-0.077** (0.04)	-0.092** (0.01)	-0.070*** (0.00)	-0.321* (0.06)
Tobin's q (market value of equity plus book value of debt / book value of total assets)	0.001 (0.77)	-0.003 (0.52)	0.003 (0.50)	-0.000 (0.97)	-0.002 (0.70)	0.001 (0.85)	0.007 (0.19)	0.007*** (0.01)	-0.009 (0.65)
Percent of shares acquired	-0.072 (0.13)	-0.112* (0.09)	-0.080 (0.14)	-0.039 (0.48)	-0.037 (0.53)	-0.076 (0.24)	-0.001 (0.24)	-0.001** (0.02)	-0.003 (0.36)
Holding period of block shares is longer than three years (indicator)	0.009 (0.51)	-0.004 (0.78)	0.002 (0.87)	0.009 (0.52)	0.007 (0.68)	0.007 (0.67)	-0.006 (0.73)	0.006 (0.52)	0.059 (0.39)
Acquirer and target are in the same2-digit industry (indicator)	0.012 (0.54)	0.013 (0.59)	-0.105 (0.14)	0.025 (0.25)	0.011 (0.65)	0.008 (0.76)	0.157* (0.05)	-0.398*** (0.00)	-0.322** (0.03)
Industry (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Year (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Intercept	0.028 (0.37)	0.039 (0.31)	0.031 (0.37)	-0.049 (0.18)	0.009 (0.82)	0.027 (0.52)	0.038 (0.43)	0.036 (0.12)	0.230 (0.14)
Pseudo R^2	0.0063	0.0064	0.0059	0.0049	0.0077	0.0067	0.0099	0.0061	0.1240
No. of observations	773	773	773	773	765	773	504	686	71

Table 11
Tobit Regression Estimates of the Board Representation Ratio

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). Prior stock return is measured by four-digit SIC mean industry-adjusted return for the past one year before the block acquisition. The dependent variable is the board representation ratio in targets by block acquirers (number of members of the board of directors appointed by acquirers over the three years from the acquisition date / total number of members of the board of directors in target). Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. *p*-values are in parentheses. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dependent Variable	# of Acquirer-Appointed Directors / Total # of Directors		# of Acquirer-Appointed Directors with Finance Experience / Total # of Directors		# of Acquirer-Appointed Directors with Industry Experience in the Target's Industry / Total # of Directors			
Independent Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Private equity acquirer: (indicator): a	0.250***	0.178***	0.294***	0.284***	0.080	0.034	0.082	0.108**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)	(0.56)	(0.12)	(0.03)
Prior stock performance is in the bottom 25% of the sample (indicator): b			-0.007					
			(0.86)					
High cash flow and low Tobin's q (indicator): c				-0.078*				
				(0.10)				
Operating income / total assets is in the bottom 25% of the sample (indicator): d					0.092**			
					(0.04)			
Profit margin is in the bottom 25% of the sample (indicator): e						0.071		
						(0.12)		
R&D expenditures / sales is in the top 25% of the sample (indicator):f							0.008	
							(0.86)	
Target has multiple segments (indicator): g								-0.149**
								(0.03)
*a * b*			0.159**					
			(0.05)					
*a * c*				0.159**				
				(0.05)				
*a * d*					0.165*			
					(0.07)			
*a * e*						0.274***		
						(0.00)		
*a * f*							0.200**	

							(0.03)	
*a * g*								0.219* (0.07)
Prior stock return	-0.020 (0.28)	-0.005 (0.74)		0.025 (0.25)	0.002 (0.92)	-0.008 (0.74)	0.001 (0.96)	0.009 (0.71)
Operating income / total assets	-0.010 (0.80)	-0.023 (0.46)	0.198*** (0.01)			-0.043 (0.36)	-0.061 (0.13)	-0.075* (0.06)
Log of book value of total assets	-0.053*** (0.00)	-0.027*** (0.00)	-0.036*** (0.00)	-0.022** (0.03)	-0.007 (0.52)	-0.009 (0.44)	-0.010 (0.37)	-0.011 (0.32)
Leverage (total debt / market value of equity plus book value of debt)	0.303*** (0.00)	0.161*** (0.00)	0.229*** (0.00)	0.231*** (0.00)	0.064 (0.40)	0.076 (0.32)	0.054 (0.48)	0.041 (0.59)
Tobin's q (market value of equity plus book value of debt / book value of total assets)	0.001 (0.88)	0.004 (0.42)	0.006 (0.52)		-0.006 (0.46)	-0.007 (0.44)	-0.005 (0.58)	-0.004 (0.65)
Percent of shares acquired		0.875*** (0.00)	0.455*** (0.00)	0.511*** (0.00)	0.534*** (0.00)	0.542*** (0.00)	0.536*** (0.00)	0.527*** (0.00)
Holding period of block shares is longer than three years (indicator)		0.156*** (0.00)	0.120*** (0.00)	0.131*** (0.00)	0.128*** (0.00)	0.122*** (0.00)	0.128*** (0.00)	0.128*** (0.00)
Acquirer and target are in the same 2-digit industry (indicator)		0.061* (0.08)	0.020 (0.89)	-0.017 (0.91)	0.132*** (0.01)	0.115** (0.02)	0.128*** (0.01)	0.120** (0.01)
Industry (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year (indicators)	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Intercept	-0.038 (0.57)	-0.275*** (0.00)	-0.489*** (0.00)	-0.567*** (0.00)	-0.499*** (0.00)	-0.481*** (0.00)	-0.472*** (0.00)	-0.450*** (0.00)
Pseudo R^2	0.1405	0.3619	0.3542	0.3532	0.2362	0.2535	0.2316	0.2351
No. of observations	1,081	1,080	1,094	1,124	1,012	992	1,012	1,012

Table 12
Logit Regression Estimates of the Likelihood of Nonroutine Top Executive Turnover

The sample consists of 1,132 partial block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). We define the top executive as the CEO. If a firm does not have a CEO, we use the chairman of the board as the top executive. Otherwise, the top executive is defined as the president. Following Denis, Denis, and Sarin (1997) and Kang and Kim (2008), we refer to turnover events in which the top executive is removed due to death, illness, or other nongovernance-related reasons over the three years from the acquisition date as routine turnover. We classify a management change as normal if the stated reason for the change is retirement and the retiring manager is between the ages of 64 and 66. We refer to all other turnover events as nonroutine turnover. The dependent variable takes the value of one if nonroutine top management turnover occurs and zero otherwise. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. *p*-values are in parentheses. The symbols *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Independent Variables	(1)	(2)	(3)	(4)	(5)
Prior stock return: a	-0.636***	-0.617***	-0.569***	-0.643***	-0.589***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Private equity acquirer (indicator): b		0.236			
		(0.35)			
*a * b*		-0.152			
		(0.70)			
PE acquirer has representatives with finance experience on the target's board (indicator): c			0.658		0.674
			(0.11)		(0.15)
*a * c*			-1.084*		-1.923**
			(0.10)		(0.04)
PE acquirer has representatives with same industry experience on the target's board (indicator): d				0.301	-0.026
				(0.53)	(0.96)
*a * d*				0.132	1.499
				(0.83)	(0.11)
Operating income / total assets	-0.695***	-0.689***	-0.718***	-0.678***	-0.670**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Log of book value of total assets	0.000	-0.007	-0.012	-0.002	-0.013
	(1.00)	(0.90)	(0.82)	(0.97)	(0.81)
Leverage (total debt / market value of equity plus book value of debt)	-0.336	-0.334	-0.402	-0.341	-0.400
	(0.38)	(0.38)	(0.29)	(0.37)	(0.30)
Tobin's q (market value of equity plus book value of debt / book value of total assets)	-0.046	-0.048	-0.055	-0.045	-0.052
	(0.34)	(0.32)	(0.26)	(0.34)	(0.28)
Percent of shares acquired	3.681***	3.588***	3.440***	3.657***	3.453***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Holding period of block shares is longer than three years (indicator)	1.034*** (0.00)	1.024*** (0.00)	1.024*** (0.00)	1.034*** (0.00)	1.023*** (0.00)
Acquirer and target are in the same2-digit industry (indicator)	1.251 (0.11)	1.267 (0.10)	1.253 (0.11)	1.251 (0.11)	1.265 (0.10)
Age of top executive	0.032*** (0.00)	0.032*** (0.00)	0.033*** (0.00)	0.032*** (0.00)	0.032*** (0.00)
Tenure of top executive	-0.001 (0.91)	-0.001 (0.96)	-0.001 (0.94)	-0.001 (0.93)	-0.001 (0.94)
Founder (indicator)	-0.020 (0.92)	-0.044 (0.83)	-0.084 (0.69)	-0.023 (0.91)	-0.078 (0.71)
Industry (indicators)	Yes	Yes	Yes	Yes	Yes
Year (indicators)	Yes	Yes	Yes	Yes	Yes
Intercept	-3.629*** (0.00)	-3.626*** (0.00)	-3.566*** (0.00)	-3.622*** (0.00)	-3.549*** (0.00)
Pseudo R^2	0.1455	0.1465	0.1527	0.1458	0.1552
No. of observations	998	998	998	998	998

Table 13
Heckman Two-Step Regression: Controlling for Endogeneity of Target Selection

The sample consists of 1,132 domestic block share acquisitions between 1990 and 2006. We obtain the initial sample of block share acquisitions from Thomson Financial's Security Data Corporation (SDC) Platinum database. We first identify partial acquisitions in which the acquirers initially held less than 5% of a target firm's outstanding shares and then purchased more than 5% but less than 50% of its outstanding shares. We then exclude from the sample deals in which the acquirer ends up with more than 50% of a target firm's outstanding shares after the acquisition. We also exclude cases in which the acquirer is either an Employee Stock Ownership Plan or an Employee Benefits Trust and cases in which the acquirer is a group of companies, individuals, or investment firms (i.e., more than one acquirer). A two-step regression described in Heckman (1979) is used to address the self-selection issue. The instrumental variable (*IV*) is the number of PE deals in a 4-digit SIC industry from year -5 to year 0 (announcement year) excluding the sample deal itself divided by the number of publicly listed firm in the same 4-digit SIC industry in Compustat in year 0. Acquisitions are considered to be private equity acquisition if the acquirer is either a buyout fund or a venture capital fund. Appendix provides a detailed description of the construction of the variables. *p*-values are in parentheses. All variables are described in the Appendix. The symbols *, **, and *** denote significance at the 10, 5, and 1 percent levels, respectively.

	Selection Equation	Outcome Equation				Selection Equation	Outcome Equation
	PE Indicator	Board Representation Ratio	Board Representation Ratio (Representatives with Finance Experience)	Board Representation Ratio (Representatives with Same Industry Experience)		PE-appointed Director with Finance Experience (Indicator)	Nonroutine Top Executive Turnover
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
IV	0.339**	0.162*	0.074*	0.169***	0.162***	0.417**	
	(0.03)	(0.10)	(0.08)	(0.01)	(0.01)	(0.01)	
Private equity acquirer (indicator): a		0.162*	0.074*	0.169***	0.162***		
		(0.10)	(0.08)	(0.01)	(0.01)		
R&D expenditures / sales is in the top 25% of the sample (indicator):b				0.003			
				(0.63)			
Target has multiple segments (indicator): c					-0.008		
					(0.34)		
Free cash flow (indicator): d			-0.006				
			(0.17)				
*a*b*				0.038***			
				(0.00)			
*a*c*					0.026*		
					(0.10)		
*a*d*			0.049***				
			(0.00)				
PE acquirer has representatives with finance experience on the target's board (indicator): e							-0.072
							(0.83)
Prior stock return: f		0.000	0.001	0.005	0.006	-0.115	-0.087***
		(1.00)	(0.82)	(0.25)	(0.20)	(0.33)	(0.00)
*e*f*							-0.114*
							(0.10)

Operating income / total assets		-0.199 (0.17)		-0.011 (0.23)	-0.015* (0.09)	0.722* (0.05)	-0.116*** (0.01)
Log of book value of total assets		0.055 (0.12)	-0.001 (0.20)	-0.002 (0.29)	-0.002 (0.32)	0.001 (0.99)	-0.001 (0.88)
Leverage		0.091 (0.71)	0.021*** (0.01)	-0.003 (0.83)	-0.005 (0.68)	0.856*** (0.01)	-0.037 (0.59)
Tobin's q		0.003 (0.91)		-0.002 (0.20)	-0.002 (0.23)	0.062 (0.13)	-0.006 (0.38)
Percent of shares acquired			0.077*** (0.00)	0.138*** (0.00)	0.136*** (0.00)		0.667*** (0.00)
Holding period of block shares is longer than three years (indicator)			0.013*** (0.00)	0.014** (0.01)	0.013** (0.01)		0.174*** (0.00)
Acquirer and target are in the same2-digit industry (indicator)			0.021 (0.22)	0.036 (0.14)	0.034 (0.16)		0.219* (0.09)
age							0.005*** (0.00)
tenure							-0.000 (0.96)
founder							-0.010 (0.77)
lambda			-0.015 (0.51)	-0.088*** (0.01)	-0.081** (0.01)		0.113 (0.49)
Industry (Indicators)		Yes	Yes	Yes	Yes	Yes	Yes
Year (Indicators)		Yes	Yes	Yes	Yes	Yes	Yes
Constant		-1.600*** (0.00)	-0.013 (0.16)	-0.008 (0.64)	-0.005 (0.77)	-2.589*** (0.00)	-0.138 (0.20)
Wald χ^2			172.15***	199.20***	191.75***		221.62***
No. of observations	1,092	1,091	1,092	1,022	1,022	1,005	1,005

Appendix 1
Definitions of Variables

This appendix shows detailed descriptions of the construction of all the variables used in the tables.

Variable name	Definition
Age of top executive	Age of top executive in the year before the partial acquisition.
Board representation (indicator)	One if the acquirer has board representation on the target's board during the block ownership holding period (up to three years after the block share purchase) and zero otherwise.
Board representation ratio	Number of members of the board of directors appointed by acquirers / total number of members of the board of directors in target during the block ownership holding period (up to three years after the block share purchase).
Control (indicator)	One if the purposes of acquisitions disclosed in a 13 filing are for hostile takeover, proxy fights, or any actions related to seeking control and zero otherwise.
Finance experience (indicator)	One if the director has finance experience and zero otherwise. The director is considered to have finance experience if: (1) the director has been an officer in a finance service company with a position higher than or equivalent to vice president or director, including the general partner of a private investment firm, or (2) the director has been a CFO or a treasurer in any company.
Founder (indicator)	One if the top executive is the founder of the firm and zero otherwise
Free cash flow (indicator)	One if the ratio of target cash flow to total assets is above the sample median and its Tobin's q is below the sample median.
Industry experience (indicator)	One if the director has target industry experience and zero otherwise. The director is considered to have target industry expertise if: (1) the director has worked for other companies in the same two-digit SIC industry as the target, or (2) the director has been a board member of such companies.
Holding period of block shares is longer than three years (indicator)	One if the acquirer holds block shares for longer than 3 years after the partial acquisition and zero otherwise.
IV	Instrumental variable, which is the number of PE deals in a 4-digit SIC industry in year -5 to year 0 (announcement year) excluding the sample deal itself divided by the number of publicly listed firm in the same 4-digit SIC industry in Compustat in year 0.
λ_1	The inverse Mill's ratio term for PE acquirers.
λ_2	The inverse Mill's ratio term for non-PE acquirers.
Leverage	Total debt / market value of equity plus book value of debt.
Log of book value of total assets	Log (total assets)
Nonroutine Top Executive Turnover (indicator)	One if nonroutine top executive turnover event occurs in a certain year and zero otherwise. We define the top executive as the CEO. If a firm does not have a CEO, we use the chairman of the board as the top executive. Otherwise, the top executive is defined as the president. Following Denis, Denis, and Sarin (1997) and Kang and Kim (2008), we refer to turnover events in which the top executive is removed due to death, illness, or other nongovernance-related reasons over the three years from the acquisition date as routine turnover. We classify a management change as normal if the stated reason for the change is retirement and the retiring manager is between the ages of 64 and 66. We refer to all other turnover events as nonroutine turnover.

Number of segments	The number of different target segments reported in *Compustat Industry Segment* file.
Operating income / total assets	Earnings before interest, taxes, depreciation, and amortizations / total assets
PE (indicator)	One if the acquirer is either a buyout fund or a venture capital fund and zero otherwise.
Percent of shares acquired	Sum of the percent of shares acquired at the transaction date and the percent of additional shares that the acquirer purchased up to the three years after the transaction date.
Prior stock return	Four-digit SIC industry mean-adjusted return for the past one year before the block acquisition
R&D expenses / sales	Target industry's R&D expenses divided by sales.
Tenure of top executive	The number of years that the current top executive serves as a CEO as of the year before the partial acquisition.
Tobin's q	Market value of equity plus book value of debt / book value of total assets.