Why are firms sold?

Evidence from acquisitions of European private firms

Yeejin Jang
Purdue University
jang67@purdue.edu

Natalia Reisel
Fordham University and New York University
nreisel@fordham.edu

This version: December, 2015

We would like to thank Nagpurnanand Prabhala, Anjan Thakor, Vojislav Maksimovic, Gautam Goswami, René Stulz as well as seminar participants at Purdue University and Fordham University for valuable comments.

Why are firms sold?

Evidence from acquisitions of European private firms

Abstract

We examine motives to sell private firms and provide insights into the sources of value creation from acquisitions of private targets. Using a novel dataset, we document that less profitable, highly leveraged private firms that tend to underinvest are likely to be sold. Further, these firms experience a high level of top management turnover around the period of the acquisitions and this turnover is sensitive to poor firm performance. Additionally, we find significant improvement in firm performance such as profitability and sales growth following the acquisitions. These firms also adjust their capital structure towards lower leverage. By and large, our results suggest that sales of private firms facilitate the transition of assets to a more efficient use.

Mergers and acquisitions (M&A) represent one of the most important economic transactions in the life cycle of a corporation. Not surprisingly, there is an extensive literature that has studied such transactions. This literature, however, mainly focuses on the perspective of the buyer (acquirer). By contrast, in this paper, we analyze these transactions from the perspective of the selling company (target) with the focus on private firms.

Moeller et al. (2004) and Faccio et al. (2006) document that about 70-80% of the targets in acquisitions worldwide are private companies. Despite the fact that private companies are important participants in these transactions, few studies actually examine private targets. Furthermore, there are fundamental differences in acquisitions of private and public companies: 1) while public companies are acquired via public equity markets, private companies are acquired via private negotiation with a relatively small number of controlling shareholders (Zingales, 1995); and 2) acquirers' returns are positive for private targets but not for public targets (Fuller et al., 2002; Moeller et al., 2004) and sources of value creation are largely unknown (Faccio et al., 2006; Golubov et al., 2015). Thus, private companies warrant special attention.

In this paper, we use a novel dataset that includes financial and managerial information for private European targets. The unique feature of the data is that we are able to track characteristics of private targets prior, around, and after the acquisitions. This allows us to address two important interrelated questions. First, what are the motives behind the decision to sell a private company? We consider a few potential motives including efficient redeployment of

assets, expansion, and arbitrary exit.[1] Second, what are the sources of value creation/destruction for these transactions?

Our first set of results demonstrates how pre-acquisition performance of private companies differs from the performance of a control group of private companies that were not sold. We find that private targets have lower profitability but generally have a similar level of sales growth compared to private companies not acquired. They also exhibit a lower level of gross investments. The results suggest that poor firm performance may trigger the decision to sell-out. We also find evidence that private targets are highly leveraged prior to acquisitions but they are not in financial distress. Thus, the decision to sell a private firm is unlikely to be driven mainly by bankruptcy considerations as suggested by Shleifer and Vishny (1992). Further, we find that poorly performing private firms are likely to be sold when the firms' industries perform well in terms of profitability and sales growth.

We then show that private targets experience a high level of managerial turnover around the date of the acquisition. For about 48% of private targets, more than half of the top executives are replaced within three years around the acquisitions. This turnover is sensitive to firm performance prior to the acquisition: poorly performing firms experience higher managerial turnover around the acquisition. Interestingly, Martin and McConnell (1991) document similar results for a sample of U.S. public targets.[2] They attribute the findings of high turnover of poorly performing managers around the time of the acquisitions to the disciplinary role of acquisitions. Acquisitions are used to discipline managers who pursue their own objectives instead of acting in the interest of shareholders. Concentrated ownership in private firms, however, alleviates conflicts of interest between managers and shareholders and it also makes companies impervious

[1] We discuss potential motives to sell-out in the next section.
[2] See also Kang and Shivdasani (1995) and Franks and Mayer (1996) for international evidence.

to takeovers (Pagano and Roell, 1998). Thus, the disciplinary role of acquisitions is unlikely to apply to our setting.

Our next set of findings demonstrates how performance of private targets changes following the acquisitions. Using both time-series tests and a difference-in-difference approach, we find evidence that profitability, investments, and sales growth improve following acquisitions. For example, sales growth increases by about 26% following acquisitions. The improvement in performance is evident for both public and private acquirers, cross-border and domestic deals, same industry, and diversifying acquisitions. Additionally, leverage decreases significantly following acquisitions.

Taken together, our results largely suggest that redeployment of assets to a more efficient use may be the main motive to sell a private firm. Owners retain a firm for which they have a comparative advantage and sell it when another party can manage it more efficiently. The acquiring party anticipates a higher value for the firm than in its current use and the sellers capture some of the resulting efficiency gains (Lucas, 1978; Lang, Poulsen, and Stulz, 1995; Maksimovic and Phillips, 2002). The finding that leverage decreases following the acquisition also suggests that financing considerations play an important role in these transactions. Sell-outs may mitigate costs associated with high leverage such as those due to the debt-overhang problem (Myers, 1977).

Interestingly, we find little evidence that the need to raise capital for expansion or to maintain the current high level of performance explains the decision by a private firm to sell-out (Poulsen and Stegemoller, 2008; Bayar and Chammanur, 2011). Re-allocation of innovative projects from small firms to larger firms is also unlikely to be the main motive to sell a private firm (Phillips and Zhdanov, 2012). However, we find evidence that sell-outs by sole owners are

consistent with arbitrary exits driven by circumstances that are not directly related to firm performance. Unlike the case with multiple owners, firms that are sold by sole owners are less likely to exhibit poor performance prior to the acquisition and show little improvement in performance afterwards. Further, they seem to be sold at a discount relative to private firms with multiple owners which is similar to fire sales.

There is an extensive debate in the literature whether corporate transactions are driven mainly by firm value-maximization or by managers pursuing their own non-profit maximizing objectives. We provide evidence that supports the former. Importantly, we identify three main sources of value creation from acquisitions of private targets: replacement of the management team, re-adjustment of capital structure and improvement in profitability. Thus, our evidence is inconsistent with the view that firms tend to acquire assets that they cannot manage efficiently (Jensen, 1986).

Our paper is most closely related to Maksimovic and Phillips (2001) who examine markets for corporate assets using plant-level data, which include private firms' assets. They find that when a firm sells one of its plants, the total factor productivity of the plant is significantly improved under the new ownership (the case of partial-firm asset sales). However, the change in plants' productivity is insignificantly different from zero following the acquisitions of stand-alone firms (the case of the M&A transactions). Further, an increase in plant productivity following a transaction does not necessarily imply that a firm follows profit-maximizing objectives as resources can be misallocated somewhere else within the firm outside the operating side. Using comprehensive financial and managerial data on private firms, we provide new evidence on the performance improvement for target firms following merger and acquisitions and on sources of value creation for these transactions. Our results highlight that the source of

value creation is not limited to the low price paid for private targets (Officer, 2007) but is driven by significant improvement in financial performance for firms that were managed poorly. Further, we show that benefits in these transactions may come not only from the operating side of the business but also from the financing side.

Our paper builds on Erel, Jang, and Weisbach (2015) who show that acquisitions ease financial constraints of target firms. We extend their work by identifying potential channels that may allow target firms to ease financial constraints and improve investments such as replacement of inefficient management and re-adjustment of capital structure.

Our result stands in contrast to the findings in the literature that examines the determinants of initial public offerings by comparing the ex-ante and ex-post characteristics of the IPO firms with those of private firms (Pagano, Panetta, and Zingales, 1998; Aslan and Kumar, 2011). Unlike sell-outs, firms going public display high levels of growth, profitability, and investments prior to the change in ownership. Thus the sell-out to another public (or private) company generally is not just a mere substitute for a costly IPO process.

The rest of the paper is organized as follows. The next section discusses potential motives to sell-out a private firm. Section 2 presents data, sample selection procedure, and the main variables. Empirical approaches and the main results are presented in Section 3. Section 4 includes additional tests. Section 5 concludes.

1. Potential motives to sell a private company

In this section, we discuss a few potential motives for the decision to sell a private company. Specifically, we consider the efficient redeployment of assets, expansion, and arbitrary exit. Additionally, we discuss whether sell-outs may be motivated by agency problems or

bankruptcy considerations. This analysis also identifies potential sources of value creation for the M&A transactions.

1.1. Efficient redeployment of assets

The decision to sell a private firm may be driven by efficiency considerations. Improvement in efficiency following sell-outs may come both from the operating side of the business, the neoclassical view, and from the financing side, the capital structure adjustment.

The neoclassical view assumes that in each industry some firms operate more efficiently than others. Firms may differ because managerial and organizational talent varies across firms (Lucas, 1978; Maksimovic and Phillips, 2002). Owners retain a firm for which they have a comparative advantage and sell it when another party can manage it more efficiently. The acquiring party places a higher value on the firm than in its current use and the sellers capture some of the resulting efficiency gains (see also, Lang, Poulsen, and Stulz, 1995; and Hite et al., 1987). Further, Maksimovic and Phillips' (2002) model predicts that sell-outs are more likely to occur when an industry receives a positive demand shock and firms with less productive managers find it more advantageous to sell their assets to firms with more productive managers instead of producing output themselves.

There is empirical evidence consistent with the efficient redeployment of assets for partial-firm asset sales. Using plant-level data available through Longitudinal Research Database (LRD), Maksimovic and Phillips (2001) find that when a firm sells one of its plants, that plant experiences an increase in total factor productivity (under the new ownership) following the transaction. Interestingly, this is not the case for mergers and acquisitions when the whole firm is

sold. The change in the total factor productivity for target firms following the transaction is mainly insignificant (or even negative in some cases). Thus, it is still unclear how mergers and acquisitions generate value for the parties involved.

Our cash flow based measures allow us to assess firm performance in a broader sense and to investigate *directly* whether there is evidence of profit maximization following mergers and acquisitions that is consistent with the efficient redeployment of assets. Further, unlike in Maksimovic and Phillips (2001), our measures do not rely on an assumption of a production function that defines the relation between a plant's inputs and outputs. Additionally, our financial data allows us to investigate whether financing considerations play an important role in sell-outs, which is difficult to do using the LRD data because financial structure variables are not available.

Efficiency gains in sell-outs may also come from the financing side. Private firms rely heavily on debt financing (Giannetti, 2013). While debt financing has benefits, it also entails substantial costs. The costs of debt include costs of financial distress, possible asset substitution (Jensen and Meckling, 1976), and potential underinvestment in positive NPV projects due to debt overhang problem (Myers, 1977). Over-levered private firms may gain by adjusting leverage towards an optimal level.

1.2. Expansion and investment projects

A well performing private firm may agree to be acquired by another firm in order to gain access to external sources of funds and be able to sustain a high level of profitability, investments, or growth. Gaining access to a new source of funds is the most cited reason for an

initial public offering (e.g. Ritter and Welch, 2002). A private firm, however, may avoid a costly IPO process and get access to external capital through an acquisition by another company (Poulsen and Stegemoller, 2008). The latter may be an important alternative to an IPO as evidence over the last decade shows that a private firm was much more likely to be acquired than to conduct an IPO (Bayar and Chammanur, 2011).

The positive relation between high levels of investment and the likelihood of sell-outs is also emphasized by Phillips and Zhdanov (2012). Their model predicts that a small firm is likely to maintain a high level of investments, such as R&D investments, in anticipation of an acquisition. The possibility of an acquisition amplifies the potential gain from such investments. In this case, sell-outs reallocate investment projects, such as highly innovative projects, from small firms to large firms, which prefer to acquire a new project rather than to develop a project in-house.

There is some indirect empirical evidence that demonstrates a positive relation between firm performance and the likelihood of sell-out. For example, Brau, Francis and Kohers (2003) find that sell-outs are more likely in high market-to-book industries.

1.3. Arbitrary exit

The decision to sell a private company might be driven by circumstances that are not directly related to firm performance. The major owner may sell a company due to personal circumstances (e.g. desire to pursue other objectives, retirement, divorce or scandal). There is anecdotal evidence that supports this argument. A well-publicized example is the sale of the Clippers basketball franchise by the Sterlings following a social media scandal. We also identify

a few additional cases by searching deal analysis in the S&P Capital IQ database. For example, Christine Baines, the founder of Jigsaw Healthcare, a medical insurance company in the U.K., sold her company to Chase Templeton Group in 2010. This deal was initiated when she announced her interest in selling the firm in order to retire after thirty years in the business.

Given that there is no liquid market for private firm shares, acquisition is an obvious option for private firm owners to cash out. In this case, it might be easier to sell a well-performing company but there is no reason to believe that one should observe systematic improvement in performance after the transaction. Further, sell-outs for personal reasons may result in discounted prices similar to fire sales if the need for cash is time-sensitive.

Three motives for sell-outs presented above, efficient redeployment of assets, expansion, and arbitrary exit, imply different predictions regarding firm performance and management turnover prior, around, and after an acquisition. We present those predictions in Table A.

1.4. Agency and bankruptcy considerations

Since at least Berle and Means (1932), economic literature recognizes the importance of agency considerations in explaining major decisions undertaken by corporations. The literature, for example, suggests that dispersed shareholders in public firms often lack control rights to discipline managers and the M&A market may be used to acquire controlling stakes that allow replacement of target firms' managers who follow their own non-profit maximizing objectives (Manne, 1965; Martin and McConnell, 1991). This explanation for the M&A transactions, however, is unlikely to apply to private targets in this paper. Little separation of ownership and control in private firms is likely to mitigate conflict of interests between managers and

shareholders. Further, concentrated ownership structure of private firms makes companies impervious to takeovers (Pagano and Roell, 1998).

Finally, the decision to sell a private firm may be driven by bankruptcy considerations. Shleifer and Vishny (1992) predict that, in cases where private firms have trouble meeting debt payments, the owners sell the firms because they cannot borrow more or issue new equity. This argument contrasts with the efficient redeployment of assets hypothesis, which predicts that private firm that are sold are poorly performing but not in financial distress.

2. Data, sample selection and variables

In this section, we describe our data, discuss the sample selection procedure for the private targets and the control group, and present descriptive statistics for our sample and main variables.

2.1. Sample construction for European acquisitions

We use a few modules of Bureau Van Dijk (BvD) database. Our data for acquisition transactions are from the *Zephyr* database, where we obtain the detailed information on M&A deals in European countries. Accounting data are from *Amadeus*, which provides annual financial statements of public and private firms in European countries. We obtain managerial data from historical BvD DVDs because these data are static in *Amadeus* and only available as of the last filing year. The data are collected from each national official public body in charge of collecting the annual accounts in the country, and always come from the officially filed and audited accounts. The BvD database we use shares common firm identifiers. For the accuracy of

the data combining process, we rely on *Zephyr* instead of the *SDC* database because that is commonly used for M&A transaction data.[3] The BvD *Amadeus* database only provides the most recent 10-year annual information. We combine the 2006 and 2010 versions of *Amadeus* for a more comprehensive coverage with accounting information from 1997 to 2010.

One of the main advantages of using European data is that we can exploit the detailed firm-level information on private firms. Acquisitions of private companies have not been explored in depth in previous M&A literature, which primarily focuses upon public firm deals, mainly due to the data availability. Unlike the U.S., however, in most of European countries, every company with limited liability, independent of its listing status, is required to file accounting and financial statements to an official public body on a consolidated and unconsolidated basis.[4] Because of these requirements, we are able to obtain accounting and management data for privately held target firms prior to the acquisitions. In addition, as long as those target firms remain subsidiaries of the acquirers, we can trace the performance of target firms after being acquired. The firm-level information in this case is obtained from unconsolidated financial statements.

The data on managers for private firms are collected from historical BvD DVDs. For top executives, we obtain names and positions within a company starting in 1999. We restrict the data to Western European countries because the data quality is higher for this sub-set of European countries.

[3] We compare the coverage of acquisition transactions of Zephyr to that of SDC. We find that the coverage of Zephyr is slightly better especially for European countries and confirm that the transaction information is consistent.
[4] Company filing requirements vary by country, but they are usually based on the number of employees, the amount of capital or sales. In the U.K., for example, a company with more than £6.7 million sales, 50 employees, or £6.7 million balance sheet is required to report annual reports meeting IFRS or UK GAAP. Small companies that do not meet the standards above also need to report abbreviated balance sheet.

Data on top executives of private firms allow us to explore how acquisition transactions affect private firms' management and which factor is important in determining management turnover when a firm goes through changes in ownership. Previous papers have studied turnover of target firms' CEOs around acquisition transactions (e.g. Martin and Mcconnell, 1991), but their evidence is focused on large U.S. public target firms. Lel et al. (2015) compare top management turnover of public and private companies in European countries in general, not around the acquisition transactions specifically. To our knowledge, this paper is the first study documenting the evidence of management turnover around acquisitions for the privately held targets.

We start with the European acquisition transactions occurring from 2000 to 2010, where acquirers purchase more than 50% of the target firms' shares. This requirement confirms that acquirers obtain significant amounts of shares, becoming controlling shareholders of the target firm post-acquisitions.[5] Target firms are from 16 European countries including Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Netherlands, Norway, Portugal, Spain, Sweden, and the U.K., where the information on management teams is available, but we do not put any restrictions on the nationality of acquirers. We exclude transactions when acquirers or targets are from financial industries, buyout deals, government mergers, and reverse takeovers. We also exclude deals involving multiple targets or by multiple acquirers. Next we merge accounting data and top management turnover data of target firms, and then require target firms to have the non-missing total assets variable at least one year prior to the acquisition year. The final acquisition sample comprises of 5,707 private targets.

[5] 88% of our sample is 100% acquisition deals. The main results are similar if we exclude those partial acquisitions.

Table 1 presents the distribution of private targets by year, country, and deal type. Panel A shows that the number of deals peaks in 2007; and that 40% of the private firms are sold to public acquirers with the remaining 60% acquired by private firms. Panel B shows the deal distribution by country. Target firms are from 16 European countries with the largest number of deals from the U.K., about 27%. As robustness, we perform some tests using the U.K. deals separately later. About 41% of the deals are cross-border deals by acquirers from 64 countries. As shown in panel C, target firms are from various industries, but the vast majority of our targets is manufacturing (38%) or service firms (26%). About half of the targets are sold to firms in the same industry, while the other half of the deals is diversifying acquisitions. Compared to the plant-level acquisition sample of manufacturing firms in Maksimovic and Phillips (2001), our sample includes a broader set of deals in terms of industry distribution.

2.2. Control group

Our analysis of motives to sell a private firm and value creation for the M&A transactions requires a benchmark sample of private firms that are not sold. One of the important advantages of using European sample is that we can identify a large sub-set of such firms. We use the following procedure to construct a control sample of private firms that are not involved in any acquisition transactions during our sample period. This procedure ensures that the sample of targets is not too small relative to controls to make the empirical analysis meaningful. For each target firm, we find private firms from the same country and from the same industry with the difference in total assets less than 30% as of one year prior to the transactions. Among all the matched firms, we choose up to five control firms that have the smallest difference in total assets. For most of the deals (91% of the sample), we use the 3-digit US SIC code as an industry

specification, but for the target firms for which we are not able to find any matched firms, we use the 2-digit industry specification instead. Using this process, we find 25,089 control firms in total. 77% of target firms are matched to five control firms, and the difference in total assets is 3.7% on average. This procedure selects a large sub-set of private firms that are comparable to targets in size and industry but allows comparison on other firm characteristics that are highlighted by the theories we test.

Finally, we collect firm-year panel data for the target and control firms in our sample. We use 10-year observations around the acquisitions if available, but exclude the observations of the year when the acquisition is completed to avoid any dramatic changes or errors in accounting data on the year of the acquisitions. We require each firm-year observation to have non-missing total assets. The final panel dataset has 34,235 target-year observations.

2.3. Main variables

As a main measure for firm profitability, we use EBIT, normalized by total assets.[6] As a robustness, we also use the average of EBIT over the previous three years, the EBIT adjusted for industry performance (median EBIT at the first two-digit primary U.S. SIC code), and cash flow. We use sales growth to proxy for growth opportunities and interest coverage and leverage to analyze capital structure decisions. As the Amadeus database does not have a capital expenditure variable, we calculate gross investment as a change in fixed assets plus depreciation, normalized by previous year total assets. All variables are winsorized at the 1% tail, but because of extreme

[6] Some papers use other firm performance measures that are adjusted for depreciation and amortization (e.g. EBITDA) instead of EBIT. In Amadeus, the EBIT variable has fewer non-missing observations than EBITDA because depreciation and amortization information is not available in several countries. For this reason, we use EBIT as a main performance measure in this paper, but the main results are quantitatively similar if we use EBITDA as a performance measure.

outliers, sales growth and investment variables are winsorized at 5% for the upper tail.[7] The Appendix A1 describes how each variable is defined.

We follow Lel et al. (2015) in calculating managerial turnover. For many private companies in Europe, all top managers are often reported as managing directors. Given the difficulty in identifying the sole top executive (such as CEO) in a private firm in the BvD dataset, we compute turnover statistics for the entire top management team. Specifically, we create an indicator variable to measure a turnover event, which takes a value of one when at least half of the top management team is turned over within a year.

3. Empirical analysis and main results

In this section, we conduct an empirical analysis of performance of private targets prior, around, and after the acquisitions to provide insights into motives for sell-outs and value creation for these transactions.

3.1. Pre-acquisition analysis: What type of firm is sold?

We start our empirical analysis of the motives for sell-outs discussed in Section 1 by examining characteristics of private targets prior to acquisitions. To that end, we compare private targets to a set of control firms that were not sold. The motives for sell-outs that we analyze make contrasting predictions about target characteristics prior to acquisitions. Thus, this analysis helps in differentiating among various motives.

3.1.1. Univariate analysis

[7] The interest coverage variable is truncated at the 10^{th} and 90^{th} percentile because it is very noisy.

In Table 2, Panel A, we compare the characteristics of target and control firms as of the most recent year prior to the acquisitions. As expected for private firms, target firms in our sample are small with the mean of total assets of 88 million U.S. dollars. When compared to control groups, target firms are larger in terms of total assets. Given the size difference between target and control firms, we control for the firm size in the next section.

In univariate tests, we find that target firms are significantly different from control firms that are not acquired. Target firms have lower profitability prior to the acquisitions than control firms as they have lower EBIT and cash flows. We also find that target firms tend to have a higher leverage ratio. In addition, target firms invest roughly 9% less compared to private firms that are not sold. These simple mean comparisons between target and control firms provide preliminary evidence that poorly-performing firms and highly-levered firms are more likely to be sold. We perform more rigorous tests in a regression setting in the following sub-sections.

The evidence that poorly performing firms are likely to be sold-out is consistent with the efficient redeployment of assets. However, it is also consistent with the explanation that firms in financial distress would be acquired by other firms. To check whether poor performance of target firms in our sample is related to financial default, we also take a look at the interest coverage ratio. The interest coverage ratios are not significantly different between target firms and control firms. The magnitude of the interest coverage of target firms is high with the median of 3.53, indicating that private targets are not in financial distress.

3.1.2. Regression analysis

We employ a probit regression as a baseline model, where the dependent variable is an indicator variable for target firms. In particular, we use the following specification:

$$Probability(Target) = f\,(profitability, sales\ growth, leverage, investments, log\ assets, log\ GDP, industry\ \&\ country\ \&\ year\ fixed\ effects) \quad (1)$$

The sample includes the most recent available accounting data prior to the acquisition. In addition to the main explanatory variables, we include the log of total assets to control for any size effects on the likelihood of acquisition. We include log of GDP and target country dummies to control for unobservable country effects on acquisition activities. In addition, we include industry and acquisition year fixed effects in all regressions to control for industry-wide and time trends that may affect the transactions. Standard errors are clustered at the firm level. The number of observations varies across specifications depending on the availability of independent variables included in the regression. We report marginal effects from probit regressions in Panel B of Table 2.

First, we test whether profitability explains a firm's decision to be sold. In column (1), EBIT has a negative coefficient of -0.049, which is significant at the 1% level, implying that firms with lower EBIT are more likely to be sold. Columns (2) to (4) show that the results are robust to alternative measures of firm profitability. Firms with lower profitability in the prior three years, firms with poor performance relative to its industry and firms with low cash flow are more likely to be sold to other firms. In column (5), we find no difference in sales growth, but as shown in columns (6) and (7), target firms are highly levered and invest less compared to firms that are not sold. When we include all variables together in column (8), we find that the EBIT, leverage, and investment explain the probability of being sold-out.

The neoclassical model of Maksimovic and Phillips (2002) predicts that a poorly performing firm is sold when the firm's industry is doing well. Thus, in Table 3, we take a close look at the performance of target firms relative to the other firms within the same industry. The

regression specification is similar to Table 2 with the additions of industry-level EBIT, cash flows, and sales growth, which are measured as the median of each variable in a given year within a target firm's industry that is classified by the first two digits of the primary U.S. SIC code. We find that the coefficients of industry EBIT and industry cash flow are positive and statistically significant, which suggests that the performance of target firms compared to the industry is an important factor for acquisition decisions. The coefficient on industry sales growth is 0.301 and statistically significant at the 1% level, which implies that firms in growing industry are more likely to be sold-out. In sum, a poorly performing firm is more likely to be sold to other firms, especially when its industry is profitable and growing.

Taken together, our pre-acquisition analysis provides robust evidence that firms that are performing poorly are more likely to be sold-out than firms that are performing well. These results suggest that efficient redeployment of assets to a more productive use may be the main motive to sell a private firm. This motive predicts that firms that use their assets inefficiently, thus having lower profitability and investments, are more likely to be sold-out. In further support of the efficient redeployment hypothesis and consistent with the neoclassical model of Maksimovic and Phillips (2002), those poorly performing firms are sold when an industry is performing relatively well. Additionally, the results suggest that the capital structure consideration may play an important role in these transactions.

We do not find support for the expansion or arbitrary exit motives. In contrast to our findings, the expansion motive predicts that firms with high growth, investments or profitability are sold-out. Further, if most of private firms are sold because of owners' personal reasons, then we should see no significant differences between targets and controls prior to acquisitions.

3.2. Management turnover around acquisitions

In this section, we investigate changes in top management in private targets around acquisitions to provide further insights into the motives for sell-outs and sources of value creation for these transactions.

The efficient redeployment motive predicts that one of the sources of value creation from acquisitions is replacement of managers with poor skills. In this case, we should observe high managerial turnover in target firms around the period of the acquisitions. Moreover, we should observe management turnover to be sensitive to the pre-acquisition performance.

Figure 1 depicts top management turnover patterns for private targets and controls over the four years before and after the acquisition completion. The difference in top management turnover between target and control firms is highly noticeable. For control firms, turnover is flat over the eight-year period at about 8-9% per year. In contrast, for target firms, the turnover increases significantly around the acquisitions completion and peaks at about 28%.

Next, we examine in a regression setting whether top management turnover around an acquisition is sensitive to the performance of private targets. We focus on three-year window around acquisition completion (i.e. one year before, one year after, and the year of the completion) to observe changes in turnover. This approach is similar to Martin and McConnell (1991) who consider a period from the initial announcement of the acquisition to twelve months after the completion in the analysis of managerial turnover in public target firms. Since private firms are not required to make announcements of acquisition attempts and they do not receive much media attention, including the year prior to the acquisitions is important for consistency with the earlier studies. While our main tests of management turnover are based on this three-year window, using different windows provide similar results.

We estimate a series of probit regressions that take the following form:

$$\textit{Probability (Top management turnover)} = f(\textit{firm performance, log assets, log GDP, industry \& country \& year fixed effects}) \quad (2)$$

The dependent variable is top management turnover over the three-year window. It takes a value of one if the top management turnover dummy equals one at least one year of the three-year window, and zero otherwise. Our specification follows previous research such as DeFond and Hung (2004) and Aggarwal et al. (2011) and defines *Firm Performance* as the one-year lagged ratio of earnings before interest, taxes and depreciation to total assets and includes a set of firm control variables, country, industry and year controls. Now we use a sample of target firms only, excluding controls. Since top management team information is not available for all target firms in our sample, the number of deals decreases to 2,296.

In Table 4, the marginal effects from probit regressions are reported. The coefficient on EBIT is -0.14 and it is significant at the 5% level, suggesting that top management of poorly performing firms are more likely to be replaced around acquisitions than those of well performing firms. The magnitude of the coefficient indicates that a one standard deviation decrease in the target firms' EBIT prior to the acquisitions increases the probability that more than half of the target firms' top executives will be replaced by three percentage points. The economic magnitude of the turnover sensitivity to performance is not trivial, given a mean of management turnover of target firms around acquisitions is 20%, which is equivalent to an 11% change in top management turnover rate in target firms. When we use alternative measures of profitability (EBIT over the previous three years, industry-adjusted EBIT, and cash flows), we also find robust results: management turnover of target firms is sensitive to target firms' previous performance.

Although we do not tabulate the results, we find no difference in the management turnover rate between same industry mergers and diversifying mergers, public acquirer and private acquirer, and cross-border deals and domestic deals.

Overall, we find a high level of managerial turnover around the period of the acquisitions. Further, managers of the target firms that perform poorly prior to the acquisitions are more likely to be replaced, which is consistent with the efficient reallocation of assets. Low skilled or inefficient management are replaced by new employees to manage assets better. Again, we do not find evidence to support the expansion motive, which predicts that managers stay following the acquisitions, or the arbitrary exit motive, which predicts that management turnover around acquisitions is not conditional on poor firm performance.

3.3. Post-acquisition analysis: Evidence on value creation

Empirical evidence documented in the previous sections largely supports the efficient redeployment of assets hypothesis. If the efficient redeployment of assets is indeed the main motive for sell-outs of private firms, we should observe improvement in firm performance post-acquisitions.

Generally, it is empirically challenging to test whether acquisitions create value or not especially when acquisitions involve private targets. First, in order to observe changes in target firms after the acquisitions, one needs information at the firm-level not only before but also after the transaction. Second, the information on private firms that are not sold is needed to provide direct comparison of the performance between the two groups. Previous papers are limited to analyzing stock returns of acquirers' shareholders around acquisition announcements because of

the data availability. However, acquirers' returns around deal announcement dates are only available for acquisitions by public firms, and the announcement returns can reflect the combination of a lot of information such as overpayment. In addition, as Jerrell and Poulsen (1989) point out, there might be little impact on bidders' returns if targets are relatively small compared to acquirers.

As discussed in section 2, the BvD data allows us to analyze post-acquisitions performance of private targets. Panel A of Table 5 reports the summary statistics of target firm characteristics one year before and after the acquisitions. In a simple univariate test, we find that target firms' size does not change after the acquisitions in terms of total assets. However, they have higher cash flows and lower leverage after being acquired and the differences are statistically significant in univariate tests.

Next, we test whether changes in firm performance and capital structure are statistically significant in a regression setting. First, we compare whether performance of target firms changes after the acquisition relative to the set of control firms described in Section 2.2. We take the average of two-year observations (if available) separately before and after the acquisitions. As in equation (1), we run probit regression models, where the dependent variable is defined as one for target firms and zero for control firms. The firm-level variables are measured for the two years prior to the acquisition in columns (1) and (3) and for the two years post acquisitions in columns (2) and (4). We test for the null hypothesis that the coefficients are equal across the models using seemingly unrelated estimation, which incorporates the covariance between the estimators. The p-values for these tests are presented.

The probit regression results are reported in panel B of Table 5. The coefficient on EBIT is statistically negative pre-acquisitions in column (1), but the difference is not significant any

more post-acquisitions in column (2). The coefficient on sales growth is insignificant before the acquisitions, while the difference becomes statistically significant (at the 1% level) after the acquisitions. In addition, leverage has a statistically positive coefficient of 0.02 prior to the acquisitions, but the sign changes to negative after the acquisitions and it is statistically significant at the 1% level.

These results imply that while target firms have lower profitability than comparable private firms prior to being sold, the performance difference becomes insignificant post-acquisitions. However, the difference-in-differences is insignificant ($p = 0.43$). Importantly, target firms experience an increase in sales growth and become less levered relative to the comparable firms that are not sold after the acquisitions. In both cases, the differences-in-difference is significant at the 1% level. When we use cash flows as an alternative measure for firm profitability, we find similar results.

In Appendix A2, as a robustness check, we perform our analysis separately for the U.K. to further address a concern related to cross-country differences in performance. We find stronger evidence for improvement in performance and changes in capital structure after acquisitions. Target firms in the U.K. have higher profitability than control firms after being acquired, and the difference is statistically significant at the 1% level. U.K target firms also experience an increase in growth opportunities, measured by sales growth, and a decrease in leverage after acquisitions.

Further, we analyze the effect of acquisitions on target firms' performance and investment in a panel regression framework. In this test, the sample includes five-year observations of target firms each before and after the transactions (a maximum of 10 years around acquisitions). Observations of the acquisition year are omitted. We run a series of OLS

regressions, where the dependent variables are EBIT, cash flow, sales growth, leverage, and investment, with the following specification:

Firm Performance = f (AFTER, log assets, log GDP, firm & year fixed effects) (3)

To control for any firm-specific unobservable factors that would affect performance and investment, all regressions include firm and year fixed effects. Therefore, the coefficient on AFTER variable, an indicator of observations after the acquisitions, represents whether firm performance significantly changes around acquisitions after controlling for unobservable time-invariant characteristics of target firms.

The OLS estimation results are reported in Table 6. The coefficients on the AFTER variable are positive and statistically significant for sales growth and investment, and negative and significant for leverage. We do not find any significant changes in EBIT or cash flows around acquisitions. We perform additional tests in the next section and show that these insignificant results are mainly driven by firms sold by sole owners; firms with multiple sellers exhibit improvement in profitability.

The improvement in performance is economically significant. The results suggest that sales growth of target firms increases by 0.042 and investments increase by 0.02. Given that average sales growth and investment of target firms prior to the acquisition are 0.16 and 0.075, respectively, these effects on sales growth and investment are equivalent to about a 26% increase.

While we have accounting information following acquisitions for more than 60% of the target firms, a question remains whether private targets that lack post-acquisition data exhibit different performance patterns following the transactions. One reason why we do not observe post-acquisition data for a sub-set of targets is that they may be combined with the acquirer

rather than staying as a subsidiary. There is no economic theory that suggests we should expect a different performance pattern for this sub-set of firms. Nevertheless, in Appendix A3 we take a closer look at this question by comparing acquirers' performance following acquisitions for targets with and without post-acquisition data. We find no difference in the acquirers' profitability, sales or leverage suggesting that both groups of targets exhibit similar performance patterns following acquisitions.

In sum, in this section, we find evidence that positive value following acquisitions of private targets could be created by improving growth opportunities, restructuring capital structure, and increasing investment. We find weak evidence that their profitability is improved after the acquisitions. These results provide further support for the efficient redeployment of assets.

4. Ownership structure and acquisition decisions

In this section, we analyze owner type such as sole owner to determine if it has an effect on the value creation from the acquisition of private targets. This analysis provides further insight into the motives for sell-outs.

4.1. Analysis by seller type

In this sub-section, we investigate the arbitrary exit motive in depth by using the information on types of owners of private targets. One of the distinct features of a privately held firm compared to a publicly traded firm is that private firms have a concentrated ownership structure and, in some cases, firms are majority-owned by an individual. Thus, acquisitions can occur when a majority owner decides to sell off shares for personal reasons. For example, an

owner may convert the stake into liquid assets (i.e. cash) due to divorce or retirement. If acquisition transactions are motivated by personal reasons rather than economic ones, then these types of acquisition deals will have different features from the deals motivated by the improvement in efficiency. We predict that the acquisition deals potentially motivated by owners' personal reasons are not conditional on past performance and that the improvement in firm performance is less likely to be observed.

In this section, we test this hypothesis by splitting the acquisitions deals into two categories: firms sold by one individual (sole owners) and firms sold by multiple owners. The discussion above suggests that the arbitrary exit motive for sell-outs is more likely to apply to the former rather than the latter.

We use seller (or vendor) information from the *Zephyr* database to identify the target firms that are sold by sole owners. We complement these data using ownership information from the historical Amadeus DVDs.[8] To identify sole owners, we find the sellers whose names include "mr", "mrs.", "miss", "family", "familia", or "famille." Then we manually double-check sellers' names to identify sole owners. We find 339 target firms that are sold by a single owner, and the rest of 2,489 target firms are sold by multiple owners.

In Table 7, we run probit regressions estimating the probability of being acquired as in equation (1) separately for the firms that are sold by sole owners and for the firms that are sold by multiple owners. In column (1), when using the sample that includes target firms that are sold by one owner and their control firms, we find that the coefficient on EBIT is positive and insignificant. On the other hand, when we use the sample of target firms that are sold by multiple

[8] It is possible that the ownership information of control firms is not exactly the same at the time of comparison. However, we believe that the changes in ownership structure would not be extreme for private firms if those firms do not go through acquisitions or any other equity sales transactions.

owners, we find that the coefficient on EBIT is negative and significant in column (2). The difference in the two coefficients is statistically significant at the 1% level. These results imply that firms that are sold by sole owners are performing as well as control firms, while the firms that are sold by multiple owners are performing poorly relative to control firms.

In Table 8, we separately run panel regressions similar to Table 6, comparing changes in target firms' performance and investment before and after the acquisitions for the transactions by sole sellers and for those by multiple sellers. We find robust evidence that target firms sold by multiple owners experience significant improvement in profitability in terms of EBIT and cash flows, increase in sales growth, decrease in leverage, and increase in investment. On the other hand, we find no changes in performance of target firms when they are sold by a sole owner. The differences in coefficients of AFTER dummy variables between Panel A and Panel B are statistically significant.

Our analysis using a subsample of acquisitions by seller type suggests that firm sales by sole owners are consistent with the arbitrary exit motive, and firm sales by multiple owners are consistent with the efficient redeployment motive.

4.2. Deal value analysis

Given the previous results of no significant improvement in target firms' profitability, a natural question that follows is what the sources of value for the acquisitions of firms sold by sole owners are. In this sub-section, we take a look at the deal value to investigate a source of value creation from acquisitions of firms sold by sole owners. Given that there is no liquid market for private firm shares, sole owners might be willing to sell the firm at a low price if the

need for cash is time-sensitive. Using information on total transaction value that an acquirer pays to purchase a target firm, we test whether the deal value paid is lower for sell-outs by sole owners than for those by multiple owners.

It is challenging to estimate deal premiums, especially for acquisitions of private targets. Previous papers that usually focus on public targets calculate a deal premium as the aggregate value of the different components of the securities offered by acquirers, divided by the market capitalization of target firms prior to the acquisitions (for example, Schwert (2000) and Officer (2007)). However, since private targets, by definition, do not have any public markets for their shares traded, it is difficult to measure the current market value of equity shares as a benchmark to calculate deal premiums. Instead, we take a deal multiple approach, where the deal value is scaled by target firms' fundamentals such as EBITDA, EBIT, and sales observed prior to the acquisitions.

We test whether sole owners sell firms at a lower price compared to multiple owners, controlling for target firms' fundamentals such as profitability or sales. As there are substantial outliers in the distribution of multiple variables, which is also noted by Officer (2007), we use a quantile regression framework to estimate the median effect on the deal value multiples. The independent variables of a median regression are deal value multiples and the main variable is a dummy variable indicating whether the firm is sold by a sole owner. All regressions include industry, country, and acquisition year fixed effects. The deal value information is available for 35% of acquisition transactions in our sample, and the number of observations varies depending on the variables used for calculating deal multiples.

In Table 9, we find that dummy variables for sole sellers have negative coefficients and they are statistically significant in explaining the deal premiums. Sole owners of private firms

sell off the firms at a lower price by 1.56 percentage points, holding firm profitability constant. Given the median deal value to EBITDA is 10, this estimate indicates acquisition discounts of 15.6% for private firms sold by sole owners relative to those sold by multiple owners. Our deal value analysis suggests that sole owners are selling their shares at a lower price compared to multiple owners and this could be a potential source of value creation for the acquirers.

5. Summary and Conclusions

In this paper, we analyze a few motives for sell-outs of private firms and the source of value creation for these transactions. The main empirical challenge in performing such an analysis is that it requires data on private firms prior, around, and after the transaction that are generally not available in the U.S. We overcome this challenge by accessing European data that covers acquisition transactions of private firms. For a set of private firms that were sold/acquired and for a control group of private firms that were not sold/acquired, we obtain firm-level financial and managerial data before and after the transactions.

We document three main sets of results that are new to the literature. Prior to acquisitions, private firms display low profitability, low investments, and high leverage although they are not in financial distress. Around acquisitions, private firms experience high levels of managerial turnover, which is conditional on poor firm performance. After acquisitions, private firms improve profitability, sales growth, investments and reduce leverage.

These findings are important for a few reasons. First, they provide empirical support for theoretical predictions of the neoclassical models, which emphasize the operating side of a business. However, we also find that the gains from sell-outs are not limited to the operating side

of the business but come from the financing side as well: Private targets may benefit from the adjustment of the capital structure towards optimal leverage.

Importantly, our findings also provide insights into sources of value creation from acquisitions of private targets. While the significant majority of the M&A transactions involve private targets, the sources of value creation have been largely unknown. We identify three sources of value creation: replacement of the poor management team, improvement in profitability, and re-adjustment of capital structure. Finally, our results indicate that private firms that opt for sell-outs differ substantially from firms that opt to go public via IPOs, suggesting that sell-outs are not simply substitutes for IPOs.

While the majority of sell-outs are consistent with the efficient redeployment of assets, in additional analyses, we show that a sub-set of deals with sole owners displays pre- and post-acquisition performance that is consistent with the arbitrary exit motive driven by circumstances that are not directly related to firm performance. Thus, the motives for sell-outs may depend on the owner type.

References

Aggarwal, Reena, Isil Erel, Miguel Ferreira, and Pedro Matos. "Does governance travel around the world? Evidence from institutional investors." *Journal of Financial Economics* 100, no. 1 (2011): 154-181.

Aslan, Hadiye, and Praveen Kumar. "Lemons or cherries? Growth opportunities and market temptations in going public and private." *Journal of Financial and Quantitative Analysis* 46.02 (2011): 489-526.

Bayar, Onur, and Thomas J. Chemmanur. "IPOs versus acquisitions and the valuation premium puzzle: a theory of exit choice by entrepreneurs and venture capitalists." *Journal of Financial and Quantitative Analysis* 46.06 (2012): 1755-1793.

Berle, Adolf, and Gardiner Means. "The modern corporation and private property," Cambridge/Mass (1932)

Brau, James C., Bill Francis, and Ninon Kohers. "The Choice of IPO versus Takeover: Empirical evidence." *The Journal of Business* 76.4 (2003): 583-612.

Defond, Mark L., and Mingyi Hung. "Investor protection and corporate governance: Evidence from worldwide CEO turnover." *Journal of Accounting Research* (2004): 269-312.

Erel, Isil, Yeejin Jang, and Michael S. Weisbach. "Do acquisitions relieve target firms' financial constraints?." *The Journal of Finance* 70.1 (2015): 289-328.

Faccio, Mara, John J. McConnell, and David Stolin. "Returns to acquirers of listed and unlisted targets." *Journal of Financial and Quantitative Analysis* 41.01 (2006): 197-220.

Fuller, Kathleen, Jeffry Netter, and Mike Stegemoller. "What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions." *The Journal of Finance* 57.4 (2002): 1763-1793.

Golubov, Andrey, Alfred Yamson, and Huizhong Zhang. "Extraordinary acquires." *Journal of Financial Economics* 116 (2015): 314-330.

Hite, Gailen L., James E. Owers, and Ronald C. Rogers. "The market for interfirm asset sales: Partial sell-offs and total liquidations." *Journal of Financial Economics* 18.2 (1987): 229-252.

Jensen, Michael C. "Agency cost of free cash flow, corporate finance, and takeovers." *Corporate Finance, and Takeovers. American Economic Review* 76.2 (1986).

Lang, Larry, Annette Poulsen, and Rene Stulz. "Asset sales, firm performance, and the agency costs of managerial discretion." *Journal of Financial Economics* 37.1 (1995): 3-37.

Lucas Jr, Robert E. "On the size distribution of business firms." *The Bell Journal of Economics* (1978): 508-523.

Maksimovic, Vojislav, and Gordon Phillips. "The market for corporate assets: Who engages in mergers and asset sales and are there efficiency gains?" *Journal of Finance* (2001): 2019-2065.

Maksimovic, Vojislav, and Gordon Phillips. “Do conglomerate firms allocate resources inefficiently across industries? Theory and evidence.” *Journal of Finance* (2002): 721-767.

Manne, Henry G. “Mergers and the market for corporate control.” *The Journal of Political Economy* (1965): 110-120.

Martin, Kenneth J., and John J. McConnell. “Corporate performance, corporate takeovers, and management turnover.” *The Journal of Finance* 46.2 (1991): 671-687.

Moeller, Sara B., Frederik P. Schlingemann, and René M. Stulz. “Firm size and the gains from acquisitions.” *Journal of Financial Economics* 73.2 (2004): 201-228.

Lel, Ugur, Darius P. Miller, and Natalia Reisel. “Differences in Corporate Governance between Public and Private Firms: Evidence from Top Management Turnover.” Working paper (2015).

Officer, Micah S. “The price of corporate liquidity: Acquisition discounts for unlisted targets.” *Journal of Financial Economics* 83.3 (2007): 571-598.

Pagano, Marco, and Fabio Panetta. “Why do companies go public? An empirical analysis.” *The Journal of Finance* 53.1 (1998): 27-64.

Pagano, Marco, and Ailsa Roell. “The choice of stock ownership structure: agency costs, monitoring, and the decision to go public.” *Quarterly Journal of Economics* (1998): 187-225.

Phillips, Gordon M., and Alexei Zhdanov. “R&D and the Incentives from Merger and Acquisition Activity.” *Review of Financial Studies* (2012): hhs109.

Poulsen, Annette B., and Mike Stegemoller. “Moving from private to public ownership: selling out to public firms versus initial public offerings.” *Financial Management* 37.1 (2008): 81-101.

Ritter, Jay R., and Ivo Welch. “A Review of IPO Activity, Pricing, and Allocations.” *The Journal of Finance* 57.4 (2002): 1795-1828.

Shleifer, Andrei, and Robert W. Vishny. “Liquidation values and debt capacity: A market equilibrium approach.” *The Journal of Finance* 47.4 (1992): 1343-1366.

Zingales, Luigi. “Insider ownership and the decision to go public.” *The Review of Economic Studies* 62.3 (1995): 425-448.

Table A. Motives for sell-outs

	Expansion	Efficient redeployment	Arbitrary Exit
Pre-acquisition	High firm performance/ High growth opportunity	Poor firm performance Positive demand shock in the industry	Not necessarily related to performance
Around-acquisition	Managers stay	Management turnover is conditional on poor firm performance	Management turnover is not conditional on poor firm performance
Post-acquisition	Maintain high level of firm performance	Improvement in firm performance	No improvement in firm performance necessary

Table 1. Sample distribution

This table shows the distribution of the acquisitions in our sample by the year when the acquisition is completed in Panel A, by target firms' country in Panel B, and by target firms' industry in Panel C. The sample consists of acquisitions deals of private targets in European countries in the 2000-2010 period. In Panel C, the industry classification is based on the first two digits of primary U.S. SIC code of target firms. Variable descriptions are provided in Appendix A1.

Panel A. By acquisition year

Year of Acquisition	No of Deals	Percentage	Cross-Border Deal	Same Industry Deal	Public Acquirer
2000	60	1%	48%	58%	63%
2001	158	3%	50%	51%	49%
2002	311	5%	43%	59%	45%
2003	330	6%	41%	52%	39%
2004	450	8%	43%	52%	42%
2005	561	10%	46%	54%	46%
2006	809	14%	42%	50%	41%
2007	911	16%	43%	52%	43%
2008	834	15%	41%	47%	39%
2009	547	10%	31%	54%	26%
2010	736	13%	36%	56%	35%
Total	5707		41%	52%	40%

Panel B. By target country

Target Country	No of Deals	Percentage	Cross-Broder Deal
AUSTRIA	32	1%	63%
BELGIUM	295	5%	61%
DENMARK	88	2%	50%
FINLAND	170	3%	64%
FRANCE	951	17%	34%
GERMANY	519	9%	35%
GREECE	24	0%	38%
ICELAND	4	0%	35%
IRELAND	56	1%	8%
ITALY	450	8%	64%
NETHERLANDS	309	5%	50%
NORWAY	263	5%	37%
PORTUGAL	91	2%	49%
SPAIN	570	10%	35%
SWEDEN	345	6%	43%
UNITED KINGDOM	1540	27%	55%
Total	5707		41%

Panel C. By target industry

Target 2-digit SIC	Industry Description	No of Deals	Percentage	Same Industry Deal
01-09	Agriculture, Forestry, Fishing	5	0%	20%
10-14	Mining	66	1%	48%
15-17	Construction	272	5%	35%
20-39	Manufacturing	2191	38%	52%
40-49	Transportation & Public Utilities	700	12%	61%
50-51	Wholesale Trade	568	10%	40%
52-59	Retail Trade	326	6%	52%
70-89	Services	1509	26%	58%
91-99	Public Administration	51	1%	33%
	Others	19	0%	39%
	Total	5707		52%

Table 2. Pre-acquisition analysis

This table shows the summary statistics and probit regression estimation for the probability of being a target. Each target firm is matched to private firms that are not acquired or do not acquire other firms during the sample period. Matched control firms are from the same country and have the same three-digit SIC industry code as the target firm. Matched firms are required to have total assets greater than 1 million U.S. dollars and the difference in total assets is no greater than 30% one year prior to the acquisition. The control group includes a maximum of five matched firms with the smallest difference in total assets. Panel A presents summary statistics for the accounting variables of the targets and control firms in our sample one year prior to the acquisition if available and two years prior to the acquisition otherwise. The differences in mean and median are evaluated using t-test and sign rank test, respectively. Panel B reports the marginal effects from probit models estimating the probability of being a target. The dependent variable equals one if a firm is acquired and zero for control firms. All regressions include industry, target country, and acquisition year dummy variables except column (3). Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Summary statistics

	Target		Control		
	Obs.	mean	Obs.	mean	Difference
Total Assets	5707	88.082	25089	68.099	19.984**
Number of top managers	2405	2.625	10898	2.236	0.389***
Firm Age	5362	20.461	24939	20.872	-0.411
EBIT	5433	0.049	23843	0.058	-0.009***
EBIT 3 years	5433	0.050	23843	0.057	-0.006**
Cash Flow	5069	0.066	21671	0.082	-0.015***
Sales Growth	4383	0.137	19169	0.141	-0.004
Leverage	5291	0.592	23821	0.584	0.008*
Interest Coverage	3621	10.124	15776	9.697	0.427
Investment	4696	0.067	20105	0.074	-0.008***
Number of Firms	5707		25089		

Table 2, continued

Panel B. Probit regression

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Prob(Target = 1)							
EBIT	-0.049***							-0.041*
	(-3.24)							(-1.80)
EBIT 3 years		-0.046***						
		(-2.74)						
EBIT industry adjusted			-0.052***					
			(-3.43)					
Cash Flow				-0.134***				
				(-6.52)				
Sales Growth					-0.004			0.005
					(-0.58)			(0.66)
Leverage						0.034***		0.026**
						(3.58)		(2.07)
Investment							-0.086***	-0.077***
							(-4.24)	(-3.26)
Log Assets	0.009***	0.009***	0.010***	0.011***	0.014***	0.009***	0.011***	0.015***
	(4.52)	(4.54)	(5.19)	(5.15)	(5.95)	(4.26)	(4.65)	(6.05)
Log GDP	-0.086	-0.089	-0.092	-0.003	-0.150	-0.041	-0.082	-0.069
	(-0.65)	(-0.68)	(-0.71)	(-0.02)	(-1.00)	(-0.31)	(-0.54)	(-0.43)
Industry Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Country Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Acquisition year Dummies	Y	Y	Y	Y	Y	Y	Y	Y
Observations	29,276	29,276	29,276	26,740	23,551	29,112	24,801	21,034
Log-likelihood	-13981	-13983	-13998	-12902	-11247	-13744	-11980	-9974

Table 3. Pre-acquisition analysis: Industry performance

This table reports the marginal effects from probit models estimating the probability of being a target with industry-level independent variables. The sample includes all target firms and control firms in European countries. The dependent variable equals one if a firm is acquired and zero for control firms. Industry-level EBIT, Cash flow, and Sales growth are measured as a median of each variable in a given year in the firms' industry based on the first two digits of the primary U.S. SIC code. All regressions include two-digit SIC industry code, target country, and acquisition year dummy variables. Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
	Prob(Target = 1)		
EBIT	-0.051***		
	(-3.35)		
Industry EBIT	0.363*		
	(1.96)		
Cash Flow		-0.137***	
		(-6.65)	
Industry Cash Flow		0.693**	
		(2.39)	
Sales Growth			-0.007
			(-1.05)
Industry Sales Growth			0.301***
			(4.00)
Log Assets	0.009***	0.011***	0.013***
	(4.49)	(5.09)	(5.78)
Log GDP	-0.095	-0.011	-0.235
	(-0.72)	(-0.08)	(-1.55)
Industry Dummies	Y	Y	Y
Country Dummies	Y	Y	Y
Acquisition year Dummies	Y	Y	Y
Observations	29,276	26,740	23,551
Log-likelihood	-13980	-12899	-11239

Table 4. Top management turnover around acquisitions

This table shows the probit regression estimation for the probability of top management turnover around the acquisition. The marginal effects are reported. The sample includes target firms only. The dependent variable equals one if more than half of top managers are replaced at least one year in three years around the acquisition and zero otherwise. The firm-level variables are measured in one year prior to the acquisition. All regressions include one-digit SIC industry code, target country, and acquisition year dummy variables except column (3). Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)
	Prob(top management turnover =1)			
EBIT	-0.140**			-0.188**
	(-2.35)			(-2.33)
EBIT 3 years		-0.147**		
		(-2.10)		
EBIT industry adjusted			-0.138**	
			(-2.30)	
Sales Growth				0.013
				(0.40)
Leverage				0.033
				(0.61)
Log Assets	0.022***	0.022***	0.022***	0.016*
	(2.81)	(2.86)	(2.83)	(1.78)
Log GDP	1.288**	1.291**	1.285**	1.511**
	(2.03)	(2.03)	(2.02)	(2.06)
Industry Dummies	Y	Y	N	Y
Country Dummies	Y	Y	Y	Y
Acquisition year Dummies	Y	Y	Y	Y
Observations	2,296	2,296	2,296	1,841
Log-likelihood	-1357	-1358	-1358	-1102

Table 5. Changes in firm performance around acquisitions

This table shows the summary statistics and regression estimations for changes in firm performance around the acquisition. Panel A presents summary statistics for the firm-level variables of the targets in our sample as a two-year average before and after the acquisitions. The difference in mean is evaluated with a t-test. Panel B reports the marginal effects from probit models estimating changes in target firm performance relative to control firms before and after the acquisitions. The sample includes target and control firms. The dependent variable equals one for target firms and zero for control firms. The firm-level variables are measured in one year prior to the acquisition in columns (1) and (3) and one year after the acquisitions in columns (2) and (4). We report p-values for the difference in coefficients of each variable from the joint estimation of two probit models. All regressions include two-digit SIC industry code, target country, and year dummy variables. Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Summary statistics

	BEFORE		AFTER		
	Obs.	mean	Obs.	mean	Difference
Total Assets (USD million)	5707	87.188	3743	92.952	5.763
EBIT	5460	0.050	3642	0.055	0.006
Cash Flow	5139	0.069	3442	0.079	0.010**
Sales Growth	4405	0.159	3361	0.141	-0.017*
Leverage	5452	0.600	3556	0.560	-0.040***
Investment	4749	0.075	3357	0.073	-0.002
Number of Firms	5707		3743		

Table 5, continued

Panel B. Probit regressions before and after the acquisitions

	(1)	(2)	*diff.*	(3)	(4)	*diff.*
	BEFORE	AFTER	*p-value*	BEFORE	AFTER	*p-value*
EBIT	-0.043**	-0.016	*0.38*			
	(-2.12)	(-0.71)				
Cash Flows				-0.060**	-0.014	*0.23*
				(-2.43)	(-0.53)	
Sales Growth	0.006	0.063***	*0.00*	0.004	0.062***	*0.00*
	(0.72)	(7.75)		(0.49)	(7.68)	
Leverage	0.026**	-0.049***	*0.00*	0.023*	-0.050***	*0.00*
	(2.08)	(-3.77)		(1.81)	(-3.77)	
Investment	-0.079***	0.034	*0.00*	-0.069***	0.037	
	(-3.38)	(1.49)		(-2.92)	(1.61)	
Log Assets	0.015***	0.010***		0.015***	0.010***	
	(6.37)	(3.78)		(6.39)	(3.85)	
Log GDP	-0.057	-0.123		-0.054	-0.135	
	(-0.36)	(-0.70)		(-0.34)	(-0.76)	
Industry, Country, Year Dummies	Y	Y		Y	Y	
Observations	21,021	17,213		20,854	17,098	
Log-likelihood	-9965	-7682		-9890	-7636	

Table 6. Changes in target performance before and after the acquisitions: Panel regression

This table shows the panel OLS regression estimations for changes in firm performance and investment around acquisitions. The sample includes firm-year observations of target firms ten years around the acquisitions. Observations at the year of acquisition are dropped. *AFTER* is equal one for the years after the acquisitions and zero otherwise. All regressions include firm and year fixed effects. Standard errors are corrected for clustering the observations at the firm level and t-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	EBIT	Cash Flow	Sales Growth	Leverage	Investment
AFTER	-0.004	0.003	0.042***	-0.030***	0.020***
	(-1.00)	(0.96)	(3.71)	(-6.21)	(5.07)
Log Assets	0.027***	0.017***	0.090***	0.031***	0.036***
	(7.26)	(4.79)	(9.42)	(7.09)	(11.20)
Log GDP	0.138*	0.071	-0.488**	0.012	-0.185***
	(1.76)	(1.06)	(-2.57)	(0.11)	(-2.68)
Firm FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observations	32,534	30,435	26,943	32,223	28,102
Adj. R-squared	0.436	0.386	0.118	0.645	0.181

Table 7. Pre-acquisition analysis by types of target owners

This table reports the marginal effects from probit models estimating the probability of being a target by types of target firm owners. The dependent variable equals one if a firm is acquired and zero for control firms. The sample includes target firms that are sold by one individual owner and their control firms in column (1). In column (2), the sample includes target firms that are sold by multiple owners and their controls. We report p-values for the difference in coefficients of each variable from joint estimation of two probit models. All regressions include two-digit SIC industry, target country, and acquisition year dummy variables. Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	*diff.*
	Sole Seller	Multiple Sellers	*p-value*
EBIT	0.158	-0.161***	*0.00*
	(1.62)	(-4.79)	
Sales Growth	-0.001	0.010	*0.76*
	(-0.03)	(0.83)	
Leverage	0.030	0.029	*0.97*
	(0.57)	(1.62)	
Investment	-0.067	-0.125***	*0.60*
	(-0.69)	(-3.50)	
Log Assets	0.008	0.017***	
	(0.61)	(4.89)	
Log GDP	-0.714	-0.232	
	(-0.93)	(-0.94)	
Industry, Country, Acquisition year dummies	Y	Y	
Observations	1,296	9,480	
Log-likelihood	-609.3	-4514	
# targets	241	1,783	
# controls	1,055	7,697	

Table 8. Changes in target firm performance by types of target owners

This table shows the panel OLS regression estimations for changes in firm performance and investment around acquisitions by types of target owners. The sample includes firm-year observations of target firms ten years around the acquisitions. Observations at the year of acquisition are dropped. All regressions include firm and year fixed effects. In Panel A, the sample includes target firms that are sold by sole l owner. In Panel B, the sample includes target firms that are sold by multiple owners. Control variables include Log Assets and Log of GDP, but the coefficients are not reported to save space. Standard errors are corrected for clustering the observations at the firm level and t-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A. Sole seller

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	EBIT	Cash Flow	Sales Growth	Leverage	Investment
AFTER	-0.027	-0.001	0.010	-0.029	0.033**
	(-1.55)	(-0.08)	(0.24)	(-1.49)	(2.07)
Firm FE, Year FE control variables	Y	Y	Y	Y	Y
Observations	1,944	1,884	1,619	1,972	1,745
Adj. R-squared	0.473	0.406	0.114	0.638	0.191

Panel B. Multiple sellers

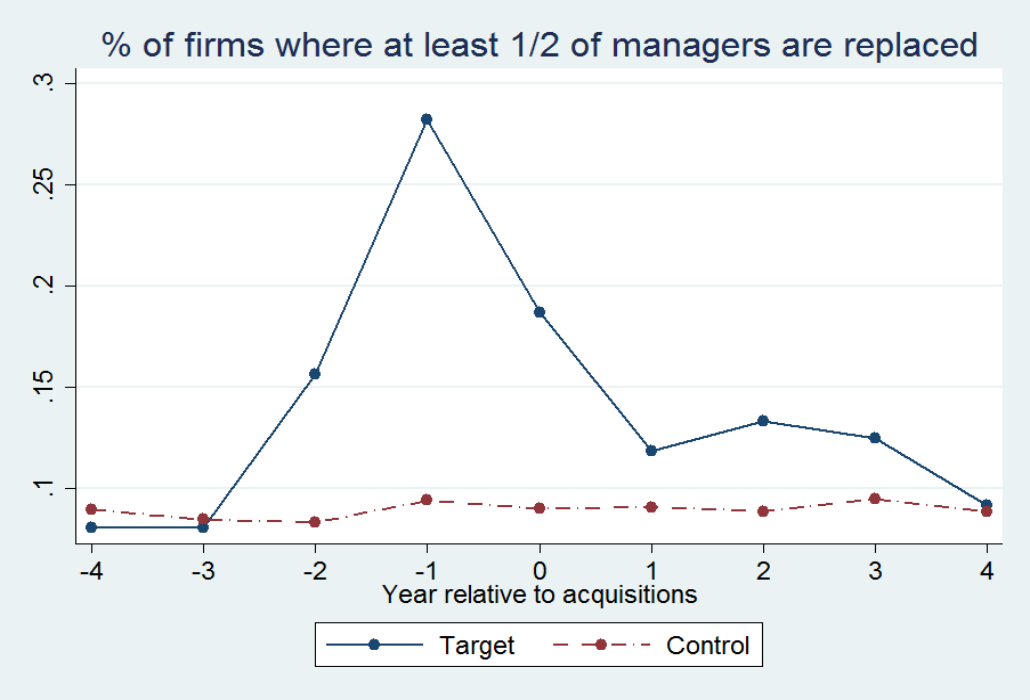
	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	EBIT	Cash Flow	Sales Growth	Leverage	Investment
AFTER	0.012*	0.019***	0.038**	-0.044***	0.027***
	(1.94)	(3.36)	(2.19)	(-5.58)	(4.38)
Firm FE, Year FE control variables	Y	Y	Y	Y	Y
Observations	14,767	13,633	12,361	14,362	12,512
Adj. R-squared	0.417	0.376	0.122	0.635	0.199

Table 9. Deal value multiples by types of target owners

This table shows the median regression estimations for deal value multiples. The sample includes the target firms that have deal value information available. The dependent variables are deal value scaled by EBITDA, EBIT, and Sales, respectively, estimated one-year prior to the acquisitions. All regressions include one-digit SIC industry code, target country, and acquisition year dummy variables. Standard errors are corrected for clustering the observations at the firm level and t-statistics are in parentheses. Variable descriptions are provided in the Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)
Dependent Variable:	Deal Value to EBITDA	Deal Value to EBIT	Deal Value to Sales
Sole seller	-1.559*	-1.780*	-0.250**
	(-1.79)	(-1.67)	(-2.08)
Industry, Country, Acquisition year FE	Y	Y	Y
Observations	773	719	1,036

Figure 1. Top management turnover around acquisitions



Appendix A1. Variable Definition

Variable	Definition
AFTER	An indicator variable equals to one for firm-years after being acquired
Total Assets	Total assets in U.S. million dollars
EBIT	EBIT/Total assets
EBIT 3 years	Average of EBIT over previous three available years
EBIT industry adjusted	EBIT - Industry EBIT, where Industry EBIT is the median EBIT in a given year in the same industry at the first two digits of the primary U.S. SIC code of target firms.
Cash Flow	Cash flows/Total assets
Sales Growth	(Sales - Lagged sales)/Lagged sales
Leverage	(Long-term debt + Current liabilities)/Total assets
Investment Coverage	EBIT/Interest paid
Investment	(Fixed assets - Lagged fixed assets + Depreciation)/Total assets
Log Assets	Log of total assets in U.S. million dollars
Log GDP	Log of GDP of target country in U.S. million dollars
Industry EBIT	Median EBIT in a given year in the same industry measured at the first two digits of the primary U.S. SIC code of the target.
Industry Cash Flow	Median Cash Flow in a given year in the same industry measured at the first two digits of the primary U.S. SIC code of the target.
Industry Sales Growth	Median Sales Growth in a given year in the same industry measured at the first two digits of the primary U.S. SIC code of the target.
Turnover	An indicator variable that equals to one if at least half of the top management team is turned over in a given year.
Sole seller	An indicator variable that equals to one for a deal where a firm is sold by single individual and zero otherwise. The owner information is manually checked using the seller names provided by *Zephyr*.
Deal Value to EBITDA	Deal value/the most recent target EBITDA prior to the acquisition
Deal Value to EBIT	Deal value/the most recent target EBIT prior to the acquisition
Deal Value to Sales	Deal Value/the most recent target Sales prior to the acquisition

Appendix A2. Changes in firm performance and investment around the acquisitions: U.K. targets only

This table reports the marginal effects from probit models estimating the probability of being a target for a subsample of the U.K. target firms. The regression specification follows Panel B of Table 5. Standard errors are corrected for clustering the observations at the firm level and z-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)		(3)	(4)	
	Prob (Target = 1)		*diff. p-*	Prob (Target = 1)		*diff. p-*
	BEFORE	AFTER	*value*	BEFORE	AFTER	*value*
EBIT	0.035	0.210***	*0.00*			
	(0.93)	(4.94)				
Cash Flows				0.060	0.252***	*0.01*
				(1.25)	(4.95)	
Sales Growth	-0.038**	0.069***	*0.00*	-0.040**	0.074***	*0.00*
	(-2.05)	(3.96)		(-2.12)	(4.31)	
Leverage	0.056**	-0.094***	*0.00*	0.062**	-0.082***	*0.00*
	(2.22)	(-3.57)		(2.39)	(-3.05)	
Investment	-0.035	0.084	*0.12*	-0.042	0.061	*0.18*
	(-0.66)	(1.61)		(-0.80)	(1.16)	
Log Assets	0.019***	0.007		0.020***	0.006	
	(4.02)	(1.25)		(4.01)	(1.18)	
Log GDP	-0.438	-0.664		-0.465	-0.712	
	(-0.88)	(-1.40)		(-0.93)	(-1.50)	
Industry Dummies	Y	Y		Y	Y	
Country Dummies	N	N		N	N	
Acquisition year Dummies	Y	Y		Y	Y	
Observations	4,737	4,197		4,718	4,192	
Log-likelihood	-2158	-1921		-2151	-1919	

Appendix A3. Changes in acquirers' performance before and after the acquisitions by target firm data availability

This table shows the panel OLS regression estimations for changes in firm performance and investment around acquisitions. The sample includes firm-year observations ten years around the acquisitions. Observations at the year of acquisition are dropped. We use combined acquirer and target performance measures weighted by assets prior to an acquisition and acquirer's consolidated performance measures after the acquisition. *AFTER* is equal to one for the years after the acquisitions and zero otherwise. *Have Post Data* is equal to one if the target has post-acquisition accounting data and zero otherwise. All regressions include firm and year fixed effects. Standard errors are corrected for clustering the observations at the firm level and t-statistics are in parentheses. Variable descriptions are provided in Appendix A1. ***, **, and * represent the statistical significance at the 1%, 5%, and 10% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
Dependent Variable:	EBIT	Cash Flow	Sales Growth	Leverage	Investment
AFTER	-0.005	-0.002	0.063***	0.017*	0.019*
	(-0.87)	(-0.33)	(3.05)	(1.87)	(1.85)
AFTER *Have Post Data	-0.007	-0.008	-0.026	0.001	-0.021**
	(-1.10)	(-1.34)	(-1.32)	(0.05)	(-2.13)
Log asset	0.007*	-0.002	0.088***	0.014**	0.074***
	(1.66)	(-0.54)	(5.96)	(2.02)	(10.34)
Log GDP	0.064	0.050	0.328	-0.060	-0.014
	(1.35)	(0.92)	(1.50)	(-0.58)	(-0.14)
Firm FE	Y	Y	Y	Y	Y
Year FE	Y	Y	Y	Y	Y
Observations	19,564	17,517	15,707	19,531	15,700
Adjusted R-squared	0.499	0.422	0.111	0.700	0.128