DO ACQUISITIONS RELIEVE TARGET FIRMS' FINANCIAL CONSTRAINTS?

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ABSTRACT

Managers often claim that an important source of value in acquisitions is the acquiring firm's ability to finance investments for the target firm. This claim implies that targets are financially constrained prior to being acquired and that these constraints are eased following the acquisition. We evaluate these predictions on a sample of 5,187 European acquisitions occurring between 2001 and 2008, for which we can observe the target's financial policies both before and after the acquisition. We examine whether target firms' post-acquisition financial policies reflect improved access to capital. We find that the level of cash target firms hold, the sensitivity of cash to cash flow, and the sensitivity of investment to cash flow all decline significantly, while investment significantly increases following the acquisition. These effects are stronger in deals that are more likely to be associated with financing improvements. These findings are consistent with the view that acquisitions ease financial frictions in target firms.

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1. Introduction

In a world with imperfect capital markets, firms will sometimes face financial constraints and have to forego valuable investment opportunities. In this situation, an acquisition can potentially mitigate these constraints if an acquirer's access to capital enables the target to undertake an increased number of positive net present value investments. Being part of a larger organization subsequent to an acquisition can improve financing both through better direct access to capital markets, and also by the possibility of reallocations of capital across divisions (see e.g., Stein (2003)). Practitioners often justify acquisitions by this logic, claiming that they can better expand the target's operations because of the acquirer's internally generated cash flow and ability to raise capital externally.[1] Yet, despite the enormous literature on mergers and acquisitions, the extent to which acquisitions lower financial constraints in practice is unknown.

Perhaps the reason why financial constraints in target firms have not been evaluated empirically is that the implications of such constraints concern the financial policies of the target firm and the way in which they change following the firm's acquisition. Evaluating these predictions requires financial data on target firms both before and after the acquisition. For the U.S., such data are not publicly available. However, most European countries require disclosure of financial data for subsidiaries, so it is possible to observe the financial statements of targets both before and after they are acquired, as long as the target remains an independent subsidiary following the acquisition.

Because of this disclosure requirement, we are able to construct a sample of 5,187 European acquisitions occurring from 2001 to 2008, each of which became a wholly owned subsidiary subsequent to the acquisition. This sample contains both domestic (63%) and cross-border (37%) deals, and acquisitions by both public (36%) and private (64%) firms. Most of the targets (97.4%) are private firms; 71.6% are independent firms while the remaining targets are subsidiaries of other firms prior to the

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[1] For example, the *Financial Times* reported that AstraZeneca and Glaxo SmithKline were looking to acquire smaller biotech companies during the Financial Crisis because they were better able to fund those companies' investments than potential targets could do on their own. (*Financial Times*, September 25, 2009)

acquisition. We measure the target firms' cash and investment policies both before and after the acquisition, and evaluate the extent to which the acquisition led to improved access to capital.

To assess whether financial constraints are mitigated by acquisitions requires one to measure constraints in a particular target firm both before and after being acquired. While there are many ways to measure financial constraints, particularly useful ones come from observation of managers' own actions to address their financial position. When access to capital markets is imperfect, value maximization will lead managers to adopt financial policies that ensure that the most important investments will continue to be financed. One such policy is to hold more cash on the balance sheet, so cash holdings should be higher when managers believe they face financial constraints.[2] In addition, when faced with financial constraints, the literature has argued that the effect of a firm's incremental cash flow on investment and also on cash holdings should be higher (see Fazzari, Hubbard and Petersen (1988) and Almeida, Campello and Weisbach (2004)).[3] Therefore, a decline in the target's cash holdings, investment-cash flow sensitivities, and cash-cash flow sensitivities following an acquisition would suggest that the target's financial constraints are reduced when a target is acquired.

We use these measures to evaluate the extent to which target firms are financially constrained prior to being acquired, and that these constraints are reduced subsequent to the acquisitions. The results suggest that target firms are indeed constrained prior to the acquisition, and that the constraints are lessened after the firms are acquired. In particular, we find that cash holdings, normalized by assets, decline by approximately 1.5% for an average target firm following being acquired. The sensitivity of cash to cash flow declines significantly from a positive 10.4% to close to zero, which implies that the target firm goes from being constrained to unconstrained (see Almeida, Campello and Weisbach (2004)). Finally, there is a statistically significant decline in the sensitivity of investment to cash flow, with the

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[2] This argument dates to Keynes (1936) and has been developed and confirmed empirically in a recent literature beginning with Opler, Pinkowitz, Stulz, and Williamson (1999). For a practitioner's take on this argument see Passov (2003), who argues that precautionary considerations are relevant even for companies like Pfizer, which at the time this article was written, had a AAA bond rating.

[3] The issue of measuring financial constraints is controversial and each measure has limitations, which are discussed below in Section 2.5. Our approach is to use alternative measures in the hope that any concerns about one measure are alleviated by the fact that using other measures leads to similar results.

magnitude of the post-acquisition sensitivity being less than half of the pre-acquisition coefficient. All these results are consistent with the view that acquisitions mitigate financing constraints, potentially providing a source of value by enabling target firms to improve their investment policy.

An implication of the financing view of acquisitions is that investment should rise following the acquisition. The results suggest that investment does increase for target firms in our sample. Controlling for other factors, investment as a fraction of total assets increases by between 1.56% and 2% following the acquisition, which is a substantial effect given that the mean (median) investment ratio is 6.4% (3.4%) for targets before the acquisition.

If the estimated declines in cash holdings and the sensitivities of investment and cash to cash flow reflect the easing of financial constraints because of the acquisition, then these declines should be larger following acquisitions that are more likely to increase the ability of firms to finance investment. For example, the decline in cash holdings and sensitivities should be larger following acquisitions of independent firms than following acquisitions of subsidiaries of other firms. Consistent with this prediction, we find that, for independent targets, their cash-to-asset ratio decreases by 1.8%, the cash flow sensitivity of cash decreases by 8.2%, and the investment sensitivity of cash flow decreases by 5.2%. Each of these declines is statistically significantly different from zero. We do not find significant changes in the cash-to-asset ratio or either sensitivity when the target firm is a subsidiary of another firm. Overall, these findings are consistent with independent targets being more financially constrained than subsidiary targets prior to being acquired.

Furthermore, we expect these declines to be larger when targets are smaller. Consistent with this logic, the reduction in cash-to-asset ratio is statistically significant only for the subsample of the smaller targets, with an estimated decline of 2.4% for the bottom tercile of firms ranked by asset size. The cash flow sensitivities of cash and investment also declines by 7.3% and 7.8%, respectively, after the acquisition for this subsample of firms. For the largest tercile of firms, there are no significant declines for any of these variables. These cross-sectional patterns suggest that our estimates of changes in constraints are largest in those targets *a priori* most likely to be constrained.

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Overall, the results suggest that managers of acquired firms change their financial policies in a manner consistent with their becoming less financially constrained following the acquisition. Target firms hold less cash, save less cash out of incremental cash flows, their investment tends to be less correlated with cash flows, and they increase the quantity of investments after they are acquired. These effects are larger when the target is most likely to be constrained prior to the acquisition. Presumably, the parent's cash flows as well as the parent's access to capital markets allow the target firm to manage its financial position more efficiently. These results are consistent with the view that one motive for acquisitions is the value created due to the relaxation of financial constraints.

This paper contributes to a long line of research on the motives for mergers and acquisitions. Early work in this area documented value increases associated with mergers, taking the form of stock price increases as well as improved earnings for the combined firm relative to the pre-merger levels.[4] Once the gains' existence had been established, much attention was paid to their sources. For a long time, the presumed source was efficiency gains. But not until plant-level data on production efficiency was available, was the existence of efficiency gains verified empirically.[5] In addition, the literature has documented relatively small transfers to shareholders from other stakeholders such as employees, the government, and consumers.[6] In terms of sources of gains arising from inefficiencies, the dramatic stock price increases of the 1990s prompted much work on price inefficiency as a motive.[7] Yet, there has been surprisingly little work on the role of improvements in financing efficiencies as a source of merger gains.[8]

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[4] See Jensen and Ruback (1983) for a survey of the early merger event studies, and Healy, Palepu, and Ruback (1992), who document that accounting performance increases following mergers of large public firms.
[5] See especially Schoar (2002) and Maksimovic, Phillips, and Prabhala (2011) for evidence on post-merger plant-level efficiency improvements. Hoberg and Phillips (2010) also document evidence of the product market synergies through a text-based analysis of product market language in 10-K filings.
[6] See Shleifer and Summers (1988) and Pontiff, Shleifer and Weisbach (1990) for discussion and evidence of transfers from employees through wage cuts and pension reversions, and Auerbach and Reishus (1988) and Hayn (1989) for transfers from the government through the tax system.
[7] See Shleifer and Vishny (2003) and Rhodes-Kropf, Robinson and Viswanathan (2005).
[8] Three exceptions are Mantecon (2008), Almeida, Campello, and Hackbarth (2011), and Liao (2011). Mantecon uses a sample of private targets acquired shortly after filing for an IPO and examines the role of uncertainty, which limits their access to external financing, in explaining the wealth effects to the acquirers. Almeida, Campello, and Hackbarth make similar arguments to ours applied to acquisitions of firms in financial difficulties, and Liao focuses on the financing role of acquisitions of partial stakes in firms.

Our paper is also related to the literature on the way firms transfer resources within firms through internal capital markets. Stein (1997) argues that even if access to capital markets does not improve by combining divisions into firms, investment efficiency can be improved by reallocating investment across divisions. Since there are likely to be improvements in direct capital access when firms are combined, the overall effect of combining firms on investment efficiency is potentially substantial.[9] The empirical literature has spent much attention to comparing the values of diversified and single-segment firms, as well as the nature of cross-subsidization inside diversified firms. However, this literature has been criticized because divisions do not combine randomly into firms, and its empirical results could potentially be a consequence of nonrandom selection rather than of internal capital markets.[10] Our results, while also coming from nonrandom combinations of companies, are potentially cleaner than those in the internal capital markets literature, since we can follow the same firms as both separate entities and as a part of new parents. Importantly, we can observe the financial management policies before and after they are acquired.

The remainder of the paper proceeds as follows: Section 2 describes the way in which we constructed a sample of European firms for which we could observe financial management practices both before and after the acquisition, presents some statistics on this sample, and discusses conceptual and practical issues involved in measuring financial constraints. Section 3 presents the tests of how cash levels, cash and investment sensitivities with cash flow, and investment levels change when a firm is acquired. Section 4 compares the extent to which financial constraints are reduced in different kinds of acquisitions. Section 5 analyzes possible explanations for the decline in targets' financial constraints post acquisitions. Section 6 presents robustness checks that address alternative interpretations of our results, while Section 7 concludes.

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[9] But not necessarily. Scharfstein and Stein (2000) present a model in which combining firms can create inefficient rent-seeking, and Ozbas and Scharfstein (2010) provide empirical support for this notion.
[10] See Berger and Ofek (1995) and Lang and Stulz (1994) for evidence on valuation differences, Shin and Stulz (1998) for evidence on cross-subsidization between divisions, and Campa and Kedia (2002) and Chevalier (2004) for the case that these results are a consequence of selection rather than internal capital markets.

2. Measuring Financial Constraints in Acquired Firms

2.1. Data Availability

To evaluate the way in which financial constraints are affected by acquisitions, it is important to have access to a sample of acquisitions for which one can measure both the existence of constraints prior to a potential acquisition, and also the way in which these constraints change following the acquisition. There are a number of approaches that have been proposed to evaluate the magnitude of financial constraints, most of which depend on access to financial data on the firm. Measuring the *change* in this magnitude requires financial data for target firms both before and after the acquisition. Constructing a sample of acquisitions containing such data is not straightforward for a number of reasons.

Before being acquired, targets are either independent firms or subsidiaries of other companies. If the target is free standing and also is publicly traded, disclosure requirements in all countries ensure that financial data on the firm is publicly available. However, vast majority of targets are private and/or subsidiaries of other corporations (see Ellis, Moeller, Schlingemann, and Stulz (2011), Erel, Liao, and Weisbach (2012) and Netter, Stegemoller, and Winoki (2011)). Given that it is impossible to get financial data for privately held firms or subsidiaries of public ones in the United States, estimating the extent to which acquisitions mitigate financial constraints would be difficult using U.S. data.[11]

Gathering financial data on the targets subsequent to the acquisition is even more problematic. In the U.S., acquirers often integrate targets with their existing assets. Indeed, if operational synergies are the driving force behind the acquisition, then it is plausible that optimal use of these synergies will lead to integration of the two firms. Even if the assets are not integrated operationally, in the U.S., their financial data sometimes is consolidated with that of the rest of the acquiring firm. If financial statements are consolidated at the parent firm level, it is impossible to identify financial data from only the former target's assets, since it will be combined with the financial data from the new parent's other assets.

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[11] There are recently available databases assembled through accounting firms on privately held U.S. firms such as *Sageworks*. However, in these databases, firms are generally anonymous, which would preclude matching targets to acquirers. See Asker, Farre-Mensa, and Ljungqvist (2011) and Farre-Mensa (2011) for more information on these data and examples of their use.

2.2. European Financial Data

In contrast to the U.S., most European countries require firms to report financial data publicly on an *unconsolidated* basis, even if they are privately held.[12] Thus for most targets, it is possible to acquire financial data prior to the acquisition, even if the firm is a subsidiary of another firm prior to being acquired. These data are accessible through the *Amadeus* database. Using this database, we construct a sample of acquisitions of European firms where target firms are operated as subsidiaries of their new parents following the acquisitions.[13]

A potential concern is whether we can correctly track the target firm's assets after they are acquired. One possibility is that the parent combines some of its other assets with those of the target firm and keeps them together organizationally in a subsidiary that appears to an outsider to consist of only the target firm's assets. Therefore, we include in our final sample only targets whose number of employees or size as measured by total assets (if the data on number of employees is missing) does not change more than 100%.[14]

2.3. Sample Construction

We start with a sample of European acquisitions taken from the *Zephyr* database. We rely on *Zephyr* rather than the more commonly used *SDC*, because both *Zephyr* and *Amadeus* are provided by a common data vendor, *Bureau Van Dyck*, and therefore share identifiers. Because of the common firm identification, it is possible to match acquisitions from *Zephyr* to financial data from *Amadeus* more accurately than it would be if one were to match *SDC* to *Amadeus.* In addition, Zephyr's coverage of private-firm acquisitions is better than *SDC's.*

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[12] There are some exceptions such as Switzerland, where not all private firms (except for banks and insurance companies) are required to file. Also, filing requirements are not uniform across countries. For example, in the U.K., firms are not required to report sales data. Furthermore, in some countries, subsidiaries in the smallest size category are not obligated to report their financials so we drop all subsidiaries in this size category from our sample.

[13] European firms can be targets of non-European acquirers. In such an acquisition, we generally cannot track the acquirer's financials post-acquisition but can usually track the target's. Consequently, we include all the acquisitions of European targets, but for some analysis where the acquirer's financial information is needed, we restrict our sample to acquisitions with European firms as both acquirers and targets.

[14] This change is measured by comparing average of the first available two years prior to the acquisition to the average of the first available two years following it. We find qualitatively similar results when we only utilize firms whose number of employees or size changes by less than 10%. We present these results in Appendix Table A4.

Amadeus is structured so that each firm has a maximum of ten observations, generally occurring between 2000 and 2009 in our sample.[15] To allow for an acquisition to have financial information for at least a year before and after the deal, we restrict the sample to those acquisitions occurring between 2001 and 2008, leaving one to eight years before and after an acquisition. We also require target firms to be from countries with at least 10 acquisition targets in this time period, eliminating a total of 74 deals with targets from Cyprus, Iceland, Luxembourg, Macedonia, Lithuania, Malta, Moldova, Serbia, and Slovenia. We exclude deals where the target is a financial firm, as well as restructurings, privatizations, LBOs, and exits from private equity deals. We also drop firms with less than 10 employees, with asset size less than $1 million, and without data on fixed assets for at least one year before and after the acquisition. We end up with a sample consisting of 5,187 deals with acquirers from 64 countries from all over the world and targets from 25 European countries.

2.4. Sample Characteristics

Amadeus provides a variety of financial data on our sample firms; however, it does not contain data on capital expenditures, which is important for understanding financial constraints. Therefore, we follow Becker and Sivadasan (2010) and Chung (2011) and estimate capital expenditures as the change in fixed assets plus depreciation, all of which are normalized by total assets. To reduce the effect of outliers in our data set, we trim accounting variables other than leverage at the top and bottom 1% of the distribution.[16] In addition, we restrict our sample to firms with leverage (normalized by assets) between zero and one.

Table 1 presents statistics on the acquisition sample. Most deals are small, with a median target asset size of roughly $7.5 million. However, the size distribution is skewed, with a mean asset size of about $67.7 million, more than eight times the median. Almost two-thirds (63.0%) of the deals are domestic and almost three-fourths (71.6%) have independent targets (not subsidiaries of another firm).

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[15] When we accessed the data set utilized in this paper, the last year fully covered was 2009. Firms that were alive in 2009 have data starting in 2000. However, for the firms that disappear from the sample before 2009, *Amadeus* keeps the data of their last ten years, as well. For example, a firm that disappeared from the sample in 2006 potentially has data available back to 1997.

[16] The results are similar if we winsorize rather than trim all accounting variables.

The vast majority (97.4%) of the acquisitions involve private targets and 36.1% of the deals are by publicly-traded acquirers. The number of deals increases over time until 2007, and declines with the Financial Crisis in 2008. The average deal size is larger in the earlier years of the sample, a mean of $125.5 million in 2002 compared to $38.3 million in 2007. Combined with the lower number of deals in the early part of the sample, this pattern suggests that the sampling process becomes less restrictive over time, so that more (smaller) deals are included.

This table highlights that the target firms in our sample are quite small, and are likely to be firms for which an acquisition is a relatively attractive source of relieving financial constraints. As a comparison, between 2001-2008, the SDC database contained 1,872 European IPOs. The mean ($358m) and median ($20m) values of assets of these IPOs were more than twice our sample mean and medians. The small size of our firms relative to those that go public suggests that the vast majority of our sample could not have gone public, and were also likely to be too small to access the public debt markets.

Appendix Table A1 contains the distribution of the countries of the target firms in the sample. Almost 30% of the deals (1,527) are for U.K. targets. France has the second most, with 748, and eight different countries each have between 200 and 350 targets. The U.K. also has the largest average sized target, with a mean asset value of $114.2 million; however, there are also a lot of very small U.K. targets, which can be seen by the median asset size of U.K. targets being only $6.8 million.

Table 2 presents statistics on the accounting variables of the targets and acquirers in our sample, each computed as the average of the two years prior to the acquisition.[17] To calculate these statistics, we use data from unconsolidated statements for the target and from consolidated statements for the acquirers. Not surprisingly, targets are substantially smaller than acquirers, with mean (median) target asset size of $67.7 million ($7.5 million) and acquirer asset size of $2,438.8 million ($172.90 million). Targets also hold more cash as a fraction of their assets, with a mean of 12.2%, compared to the mean of 9.8% for the acquirers. Targets have lower investment-to-asset ratio (mean of 6.4%) than do acquirers (mean of 12%).

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[17] Since some acquirers are not from Europe, and hence not contained in the *Amadeus* data set and some others make multiple acquisitions but are only included once in Table 2, the number of acquirers for which we have accounting data is substantially smaller than the corresponding number of targets.

For target firms, cash holdings decline following the acquisitions, as both the mean and median cash holdings are higher in the two years before the acquisition compared with the holdings after the acquisition. In addition, the median gross investment to asset ratio declines after the acquisition. However, it is difficult to draw inferences from this table. Secular trends as well as the changing composition of firms in the sample are likely to mask the incremental effect the acquisition has on these variables. To evaluate the effect of acquisitions on firms' financial policies, it is important to hold firm composition constant over time and to control for other factors statistically.

2.5. Measuring Financial Constraints

Financial constraints occur when financial frictions cause firms to deviate from their first-best investments. When firms are constrained, the availability and pricing of financing in addition to a potential investment's value will determine the projects a firm will choose to undertake.[18]

Discussion of financial constraints goes back at least to Keynes (1936), who argued that because of financial market frictions, firms hold cash as a precaution against potential future financial constraints. Firms' optimal cash holdings will be determined by equating the incremental holding cost of cash with the expected benefit in terms of improved investment coming from avoiding potential financing constraints. Consequently, firms' cash holdings should be positively related to the degree to which firms expect to face financial constraints in the future. A large empirical literature beginning with Opler, Pinkowitz, Stulz, and Williamson (1999) has confirmed that, consistent with Keynes' prediction, cash holdings are largely explained by a firm's ability to access capital markets.

A particularly controversial measure of financial constraints was introduced by Fazzari, Hubbard and Petersen (1988), and involves estimating the sensitivity of a firm's investment to its cash flow. The idea is that with frictionless capital markets, investments should be a function of the value of the firm's investment opportunities and independent of the firm's financial position. However, if there are financial constraints, then a firm will choose among projects, being able to undertake more of them when financing

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[18] Tirole (2006) provides a number of models in which constraints occur because of contracting difficulties, either because of moral hazard or asymmetric information reasons.

is more available, in particular, when there is an increase in the firm's cash flows. Empirically, Fazzari, Hubbard and Petersen (1988) and many others have documented a robust relation between a firm's cash flows and its investments. These authors interpret their findings as consistent with financing constraints being an important factor in determining corporate investments.[19]

An alternative approach to measuring financing constraints was suggested by Almeida, Campello, and Weisbach (2004), and involves estimating a firm's propensity to save cash from incremental cash flows. In the Almeida, Campello and Weisbach model, unconstrained firms invest at the first-best level, so incremental cash flows do not have any real effects on the firm's investments. However, a firm facing financial constraints will choose to allocate additional cash flows to increase their investments both today and in the future, so cash holdings to finance future incremental investment should increase with their cash flows. Consequently, the fraction of cash retained by a firm from incremental cash flows reflects management's own view as to whether the firm is likely to face financial constraints in the future. While the investment sensitivity of cash flow measures the effect of constraints on *today's* investment, the cash sensitivity reflects management's assessment of *future* constraints. Almeida, Campello and Weisbach find empirical evidence suggesting that the cash flow sensitivity of cash is strongly related to other measures of financial constraints in a sample of large, publicly-traded U.S. firms.[20]

Several papers estimate loadings of financial variables on apparent constraints to construct easily constructed indices of constraints that can be used more broadly. In particular, Lamont, Polk, and Saa-Requejo (2001) estimate the factors that predict the firms which Kaplan and Zingales (1997) classify as constrained, leading to the "KZ index". Whited and Wu (2006) use an Euler equation approach from a

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[19] Fazzari, Hubbard, and Petersen (1988) has spawned a huge literature, both debating its methodological approach, and also using the investment cash flow relation to test for financial constraints in particular settings (see for example Hoshi, Kashyap and Scharfstein (1991) and Becker and Sivadasan (2010)). Important critiques of the investment/cash flow method are Kaplan and Zingales (1997), Erickson and Whited (2000), Gomes (2001), Alti (2003), and Moyen (2004). In contrast, Rauh (2006) and Almeida and Campello (2007) argue that even in a setting where the measurement issues these papers focus on is not relevant, cash flows nonetheless affects investment, so investment cash flow sensitivities can be good measures of financial constraints despite these papers' critiques.

[20] Other authors have also used the cash flow sensitivity of cash and found it related to other measures of financial constraints. See for example Sufi (2009), Yun (2009), Hadlock and Pierce (2010), Farre-Mensa (2011) and Ostergaard, Sasson, and Sorensen (2011). However, this approach too is not without its critics; see Riddick and Whited (2009).

structural model of investment to create the "WW Index". Both indices are estimated using data on publicly traded U.S. firms using *Compustat* data.

However, even on publicly traded U.S. firms, Hadlock and Pierce (2010) find that both the KZ and WW indices are dominated by a simple index of firm age and size. We cannot use the Hadlock-Pierce size-age index for our analysis of acquisitions since, after the acquisition, the target firm becomes a part of a larger entity and hence its size goes up. So, according to the Hadlock-Pierce index, all target firms become less constrained post acquisitions. Other constraints measures that have been discussed in the literature, such as the existence of a bond rating and membership in a keiretsu (Hoshi, Kashyap and Scharfstein (1991)), are obviously not relevant for small, private European companies. Unfortunately, *Amadeus* does not contain data on dividends, so we cannot use a measure of constraints based on dividend payouts.

Consequently, given that firms in our sample are substantially smaller than *Compustat* firms and they are mostly privately held, we do not use measures of financial constraints that can be calculated for relatively larger and/or public firms only. The measures we use, the level of cash (normalized by a firm's assets), the investment to cash flow sensitivity, and the cash to cash flow sensitivity, are each motivated by theory that is equally valid in all countries and for both public and private firms. Our goal is not to take a stand on which measure of financial constraints is the most accurate. Rather, our hope is that by using three different measures, we can estimate whether acquisitions appear to reduce financial constraints in target firms, as well as the extent to which the effect is robust across alternative measures.

3. Estimates of Acquisitions' Impact on Targets' Financial Constraints

3.1. The Effect of Acquisitions on the Cash Holdings of Target Firms

We estimate multivariate models predicting aspects of firms' financial policies likely to be associated with financial constraints. We evaluate whether these policies change when the firm is acquired, controlling for other potentially relevant factors. The first such policy we consider is the level of cash holdings. If the precautionary demand for holding cash decreases when financial constraints are

eased by an acquisition, then we should observe that, holding other factors constant, firms' cash holdings decline after they are acquired. To test this hypothesis, we estimate equations predicting the quantity of cash, normalized by the firm's total assets.

We estimate the following specification:

$$Cash/Assets = a + b\ AFTER + c\ Controls + e \qquad (1)$$

AFTER is a binary variable that takes on a value of one after the acquisition. In all equations, we exclude the firm-year observations at the deal completion year. We include fixed effects for the target firm to control for time-invariant firm characteristics omitted in regressions. All specifications also include year dummies to control for changing macroeconomic conditions. In addition, we add three country-level variables, total private credit to GDP, stock market capitalization to GDP, and nominal GDP growth in local currencies, to control for variation in external financing availability. Finally, we also include firm-level controls that vary across specifications. We estimate this equation on the entire panel of firm-years for which we have data both before and after the acquisition.

We present estimates of this equation in the first four columns of Table 3. In Column (1), we include only total assets and total assets squared as firm-level variables, since there are some firm-level variables missing for some countries because of differences in reporting requirements. In Column (2), we add the firm's cash flow to total assets as a control, dropping Dutch firms from the analysis since firms from Netherlands do not have cash flow data on *Amadeus*.[21] Column (3) includes ROA but not cash flow since these variables are highly correlated, which, because of data availability, allows us to include Dutch but not Russian firms. In Column (4), we add the number of employees, leverage, and sales growth, which potentially could be related to the firm's growth opportunities. In this final equation, the number of firms declines substantially because data on some items are missing for firms from Denmark, Ireland,

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[21] Depreciation, which is one of the components of cash flow, is missing for all Russian firms in *Amadeus*. We replaced these missing values with zeros and therefore used nonmissing profit/loss values for Russian firms as their cash flows. For robustness, we re-estimate our equations eliminating Russian target firms from the sample with almost identical results.

Netherlands, Russia, and the U.K. In all equations, standard errors are corrected for clustering of observations at the firm level.

The estimates in the cash equations in the first panel of Table 3 are consistent with the view that target firms reduce their cash holdings after being acquired. The coefficient on the dummy variable indicating that a firm-year is after the acquisition is between -.0135 and -.0173, implying a drop of between 1.35% and 1.73% in the cash to assets ratio following the acquisitions. In all specifications, this decline is statistically significantly different from zero. Cash/Assets has a mean of 12.2% and a median of 6.4% before the acquisition. Relative to the sample mean, the regression coefficients imply that following an acquisition, there is about an 11% drop in cash holdings by target firms. These multivariate results confirm the pattern suggested by the univariate comparisons in Table 2, that cash holdings decline after a target is purchased.

One explanation for the drop in cash holdings in target firms following being acquired is that financial constraints are relieved in the target firms following the acquisition. However, an alternative explanation for this finding is that companies move their treasury functions centrally, so that they effectively hold the target firm's cash in the new parent firms. To evaluate this possibility, we re-estimate the equations from Panel A of Table 3 using the acquirer's cash holdings as a dependent variable, and report them in Panel B in Table 3. We calculate these acquirer holdings using the 1,215 acquirers for which we have consolidated financial data, so that they reflect the cash in the entire acquiring firm.[22] Inconsistent with the view that cash is moved from the target to the new parent following the acquisition, we find that cash holdings at the acquiring firm decline after the acquisition. This result holds on both the full sample of acquisitions and also on the subsample (not reported) in which the target's assets are at least 25% of the acquirer's assets.

The reduction in acquirer's cash could occur because, by adding the target firm's assets to the acquirer's, the acquirer has a lower precautionary demand for holding cash. In other words, in some states

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[22] In a previous draft, we presented estimates of these equations using unconsolidated financial data on acquirers, so that they reflect only the parent's financials. The results were similar to those reported here.

of the world, the acquirer will be able to rely on the cash flows generated by the former target's assets. Alternatively, it is possible that the acquirers' cash could decline because some of it is used to pay for the acquisition rather than because of a change in financial policy.

To evaluate this alternative explanation, we calculate an "adjusted" measure of cash, which equals to the reported cash for the acquiring firm plus the price that the acquirer paid for the target firm, for the subsample of acquisitions for which the deal value is available on *Zephyr*. We then re-estimate the equations in Panel B of Table 3, adjusting acquirer unconsolidated cash holdings for the acquisition itself by "adding back" the cash paid for the target firm. This approach overstates the effect of acquisitions on acquirer's cash, since not all deals were paid for entirely by cash. Nonetheless, the estimates, presented in Appendix Table A2, indicate that there is a decline in acquirer's cash of a similar magnitude to that documented in Panel B of Table 3. The decline in acquirer's cash following the acquisition does not appear to be driven by the amount paid for acquisition itself, and instead the decline likely occurs because the target's assets help insure the acquirer against bad states of the world. The fact that cash goes down in both targets and also acquirers suggests that the decline in the quantity of cash kept by the target is not merely a transfer to the new parent.

3.2. The Cash Flow Sensitivity of Cash.

Almeida, Campello and Weisbach (2004) suggest that one could measure financial constraints through the way firms save cash from incremental cash flow. In the Almeida, Campello, and Weisbach model, constrained firms save a positive fraction of incremental cash flows as cash to finance future investments; however, there is no reason for unconstrained firms to adjust their savings' behavior, since their investments are already at the first-best levels. Almeida, Campello, and Weisbach (2004), as well as a number of other papers, document that estimates of the sensitivity of cash holdings to incremental cash flows are highly correlated with other measures of financial constraints. Therefore, the *change* in the cash flow sensitivity of cash around the time of the acquisition should reflect changes in financial constraints occurring at that time.

To estimate the change in the cash flow sensitivity of cash at the time of the acquisition, we use a specification similar to the equations presented in Table 3, with two changes. First, the dependent variable is the change in cash holdings over total assets. Second, in addition to cash flow divided by assets, we include this variable interacted with a dummy indicating whether the firm-year was after the acquisition. In this specification, the coefficient on cash flow divided by assets represents the cash flow sensitivity of assets before the acquisition, and the sum of this coefficient and the coefficient on cash flow interacted with the "after acquisition" dummy variable represents the sensitivity after the acquisition.

We present estimates of this equation in Columns (1) and (2) of Table 4. To evaluate whether the target firms were constrained before being acquired, we focus on the coefficients on cash flow. These coefficients are all positive and statistically significantly different from zero. In the Column (1), where we include country-level controls, firm-level size controls as well as firm and year fixed effects, the coefficient on the uninteracted cash flow term (representing the pre-acquisition sensitivities) is .074, and is .104 when we include other controls but lose firms from Denmark, Ireland, Netherlands, Russia and U.K. from the sample in Column (2). As a rough comparison, Almeida, Campello and Weisbach (2004) estimate similar equations on a sample of large, publicly-traded U.S. firms, and find a statistically significant coefficient of .05 or .06 for their constrained subsamples and estimates close to zero for the unconstrained subsamples. Even though the studies use vastly different samples, our estimates for the pre-acquisition target firms are remarkably close to those reported by Almeida, Campello, and Weisbach. The fact that the coefficients are close between the two papers suggests that the tests are picking up a common phenomenon, likely the existence of financial constraints.

The coefficients on the "After" dummy interacted with cash flow are negative, indicating that the cash flow sensitivity of cash declines following the acquisition. The magnitudes of the coefficients on this interaction term are -.059 and -.093, almost the opposite of the coefficients indicating the cash flow sensitivity before the acquisition. The sum of the coefficients on cash flow and on cash flow interacted with the "After" measures the existence of constraints following the acquisition. In these equations, these sums are very close to, and not statistically different from, zero. These results on the cash flow sensitivity

of cash suggest that target firms appear to be financially constrained prior to being acquired but essentially unconstrained after being acquired. [23]

3.3. The Investment Sensitivity of Cash Flow.

Starting with Fazzari, Hubbard, and Petersen (1988), a large literature has estimated the sensitivity of investment to cash flow, and has used this estimated sensitivity as a measure of financial constraints. The idea is that if a firm is unconstrained, then a firm should undertake all value-increasing investments regardless of the firm's financial condition. However, if the firm faces constraints, then the projects it will undertake will be rationed, and an increase in cash flow will allow it to take more projects. Therefore, we should observe a relation between a firm's investment and its cash flow if the firm is financially constrained.

To estimate the cash flow sensitivity of investment, we use the same specification as for the cash flow sensitivity of cash with investment, normalized by assets, as the dependent variable. We report estimates of this equation in Columns (3) and (4) of Table 4. In each specification, the coefficient on cash flow is positive and statistically significant, suggesting that before the acquisition, the targets were indeed financially constrained. However, the coefficients on cash flow interacted with the after-acquisition dummy are negative and statistically significantly different from zero, which implies that the cash flow sensitivity of investment is lowered following the acquisition. [24]

The usual interpretation of this result, following Fazzari, Hubbard and Petersen (1988), is that financial constraints are eased at the time of the acquisition. This interpretation is subject to the standard critique of the investment/cash flow literature, that cash flow is likely to be correlated with investment opportunities, so that the sensitivity between investment and cash flow could reflect investment

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[23] The estimates are similar if we exclude firm fixed effects or include industry and/or country fixed effects.

[24] Most estimates of investment-cash flow sensitivity control for lagged values of the investment, since investment tends to be auto-correlated. Given the way our data was constructed, we do not include the lagged investment since we measure investment, the dependent variable, as the change in fixed assets plus depreciation, so measurement error in lagged assets would lead to a mechanical relation between our estimates of current and lagged investment.

opportunities rather than financial constraints.[25] Nonetheless, given that the results are in line with those for cash levels and cash/cash flow sensitivities, we view them as additional evidence that is consistent with the view that acquisitions lower financing constraints.

3.4. The Quantity of the Target Firm's Investments.

Financial constraints lead firms effectively to apply a higher cost of capital than they would in frictionless markets. Therefore, if acquisitions ease financial constraints, being acquired will lead target firms to evaluate investment opportunities using a lower cost of capital, and consequently undertake more of them. This logic, which is formalized in models such as Almeida, Campello and Weisbach (2004), is often used by managers to justify acquisitions, who argue that acquirers can more efficiently finance investments for the target than it could independently.

In Table 5, we report equations predicting investment (normalized by assets), using specifications similar to those presented for cash in the first panel. In each equation, the coefficient indicating if a firm-year is after the acquisition is positive, and is statistically significantly different from zero in all specifications. In addition, the magnitude of the coefficient is large economically. The coefficients are all between 0.0156 and 0.0201, implying that investment increases by 1.5% to 2% of assets following the acquisition. Since the mean investment to asset ratio is 6.4% and the median is 3.4% during the year before the acquisition, these estimates suggest that the acquisition increases the mean firm's investment by 23% to 31% and the median firm's by 44% to 59%.

The increase in the target's investment following the acquisition is consistent with lower financial constraints leading to a lower cost of capital being applied to investment projects. However, it is also consistent with operational synergies improving investment opportunities. It is likely that both effects combine to explain the observed increase in investment following acquisitions.

If the increase in investment reflects reductions in constraints, as well as synergies, then the combined value of the acquirer and target should increase. The vast majority of our targets are private, so

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[25] This idea was originally suggested by Poterba (1988) in his published discussion of Fazzari, Hubbard and Petersen, and was developed further by Erickson and Whited (2000) and Alti (2003).

it is impossible to measure value changes for these firms. However, 36 percent of the acquirers are publicly-traded, so we can measure the acquirer's stock-price reaction to these acquirers. For this subsample of deals with public acquirers the average abnormal stock price reaction is 1.5% for three days and 2.3% for 21 days around the merger announcement date, both of which are statistically significantly different from zero at the 1% level. This finding is consistent with the notion that value is created in these deals. It is also consistent with the view that acquirers can make acquisitions at a discount because of the private targets' illiquidity or due to uncertainty about their valuation. [See Koeplin, Sarin and Shapiro (2000) or Ellis, Moeller, Schlingemann and Stulz (2011) for more discussion of acquisitions of private companies.]

4. Within-Sample Comparisons

The estimates presented to this point suggest that acquisitions are associated with declines in cash holdings, the sensitivity of cash holdings with respect to cash flow, and the sensitivity of investment to cash flow, as well as an increase in the quantity of investment for the acquired firms in our sample. These findings suggest that the acquisitions in our sample led to a reduction in financial constraints in the target firms. If an increase in the availability and a reduction in the cost of finance were indeed the reason for these results, we would expect that they would be strongest for those acquisitions for which the reduction in financial constraints is likely to be highest. We evaluate this prediction here.

4.1. Independent firms vs. Subsidiaries of other firms

An important distinction concerns whether, prior to the acquisition, the target firms are independent firms (71.6% of the sample) or subsidiaries of other firms (28.4%). If being acquired and becoming part of a larger organization helps to relieve financial constraints, then going from being independent to becoming a subsidiary should relieve them more than if a firm changes from being a subsidiary of one firm to a subsidiary of another.

To evaluate this hypothesis, we re-estimate the equations from Tables 3, 4, and 5, for the subsamples of deals in which the target is an independent firm and those for which it is a subsidiary. In

Panel A of Table 6, we report one equation for the level of cash holdings, the cash flow sensitivity of cash, and the cash flow sensitivity of investment, and the quantity of investments. The specifications follow Column (2) in Table 3, Columns (1) and (3) in Table 4, and Column (2) in Table 5, not reporting the coefficients on the size variables and two country-level controls to save space. The results indicate that for independent targets, there is a statistically significant 1.8% decline in the quantity of cash, a 8.2% decline in the cash flow sensitivity of cash, and a 5.2% decline in the investment sensitivity of cash. However, the corresponding estimated changes are not statistically significant for targets that are subsidiaries. We can reject the cross-equation restriction that the declines are equal for acquisitions of independent firms and subsidiaries for the decline in cash holdings and cash flow sensitivity of cash, but not in the investment sensitivity of cash. These estimates suggest that the declines in the measures of constraints are largest in acquisitions of independent firms, consistent with the view that they reflect reductions in financing constraints and not some other factor.

The one variable for which the effect of an acquisition is similar regardless of the target firm's status is the quantity of investments. The estimates in Table 6 indicate that the quantity of investments increases by about the same amount for both types of targets (1.7% for independent targets, 2.1% for subsidiary targets). These positive effects likely occur because the increase in investments following the acquisitions contains some operational synergies that are present, regardless of whether the target was independent or a subsidiary prior to being acquired.

4.2. Target Firm Size.

Hadlock and Pierce (2010) present evidence suggesting that, to a first approximation, a firm's size is a reasonable proxy for the likelihood it faces financial constraints. Therefore, it seems plausible that, if the above results reflect acquisitions relaxing financial constraints, then they should be stronger for deals in which the targets are smaller. To test this hypothesis, we re-estimate our main equations from earlier tables on subsamples based on the size of the target, measured by the average of the total assets in U.S. dollars over two years immediately prior to the acquisition.

In Panel B of Table 6, we divide the sample of acquisitions into terciles based on the size of the target firm and re-estimate our equations for the bottom and top terciles. We report one equation for cash holdings, the cash flow sensitivity of cash, the cash flow sensitivity of investment, and the quantity of investment using the same specifications as in Panel A. The results suggest that the reduction in cash holdings is statistically significant only for the subsample of the smaller targets, with an estimated reduction in cash to asset ratios of 0.242%. In addition, the cash flow sensitivities of cash flow to both investment and cash are larger in magnitude and statistically significantly different from zero for the smaller target subsample but not the larger target one. We test the cross-equation restriction that the differences between the declines in cash levels, and both sensitivities are larger for the smaller targets; the results indicate that the declines in cash holdings are significantly larger for the smallest tercile than for the largest one. However, the tests fail to reject the hypotheses that the sensitivities are statistically significantly different between these subsamples. Finally, the investment to assets ratio increases significantly both for the smaller and larger targets following the acquisitions, suggesting that acquisitions of both sets of targets are associated with synergies. These results are consistent with the view that smaller targets are more likely than larger targets to have financial constraints mitigated through being acquired.

5. Acquirer Constraints and Cross-Subsidization

We have documented that financial constraints in target firms, measured through these firms' own financial management policies, appear to decline after they are acquired. These constraints could decline for two reasons. First, being part of a larger organization could improve the ability of the target firms to raise capital, either because it lowers the underlying friction causing the constraints, or because the acquirers' other assets combined with those of the targets' lower the risk to a potential lender. Second, there could be transfers within combined firms that effectively lower the constraints faced by the target firms after the acquisition.

If there are transfers, there are two possibilities: First, post-acquisition firms could be unconstrained, meaning that because of the existence of internal capital markets they can invest at the first best level. Second, the post-acquisition firms could be constrained and there could be transfers of funds across units that are value increasing (or possibly decreasing) as characterized in Stein (1997) or Scharfstein and Stein (2000).

If the post acquisition firms are unconstrained, then the post-acquisition sensitivities of investment and cash to cash flow should be zero. If they are constrained, then for the acquired division (and other divisions as well), the sensitivities should be positive but lower than the pre-acquisition sensitivities. To see why, think about the Stein (1997) equilibrium, which illustrates how incremental cash flows could be allocated in a constrained firm: In this equilibrium, each division invests from its cash flow plus or minus transfers to or from the parent. So if there is an incremental shock to a division's cash flow, then they keep that amount, minus whatever fraction goes to headquarters and the other divisions. To assess whether the logic of the Stein (1997) model provides an explanation for the reduction in constraints we observe in our target firms, we test two of the model's implications: First, whether the combined firm is in fact constrained; and second, whether there are transfers across units within the firm.

5.1. Measuring Acquiring Firm Constraints.

To measure the extent to which acquirers face financial constraints, we estimate cash-cash flow and investment-cash flow sensitivities for the acquirers in our sample, both before and after the acquisition. We estimate these equations using consolidated financial data from 986 acquirers, each of which includes all subsidiaries including the target firm following the acquisition.[26] We report estimates of the cash-cash flow and investment-cash flow sensitivities for these acquirers in Table 7.

The coefficients for the cash-cash flow and investment-cash flow sensitivities in Table 7 are all positive, which suggests that the acquirers are financially constrained. When we do not control for the number of employees, sales growth and leverage in Columns 1 and 3, the coefficients indicate that both

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[26] The results are similar if we use unconsolidated financial data on acquirers that do not reflect the target firm's financials post-acquisition.

sensitivities are statistically significantly positive prior to the acquisitions. After the acquisitions, the estimates in Column 1 indicate that there is a decline in the cash-cash flow sensitivity by about half, which is difficult to interpret because neither the decline nor the post-acquisition sensitivity is significantly different from zero. The investment-cash flow sensitivity increases a small amount following the acquisition (Column 3) but this increase is not statistically significant. The post-acquisition sensitivity of investment to cash flow is positive and statistically significant in the specification presented in Column 3. However, neither sensitivity is statistically significantly different from zero when we control for the number of employees, sales growth and leverage in Columns 2 and 4. Overall, these results provide fairly weak evidence suggesting that acquirers are constrained before the acquisitions, and it is difficult to draw inferences about whether acquirers are constrained following them.

5.2. Post-Acquisition Cross-Subsidization

To test the hypothesis that transfers across subsidiaries of the new parent are the source of the reduction in financial constraints, we estimate equations similar to those reported in Shin and Stulz (1998). The idea is that if there is cross-subsidization, the cash flows of one part of the firm are, to some extent, transferred to fund investments in other parts of the firm. Empirically, this argument suggests that cash flows in the rest of the combined firm should affect investment in the former target. We test this idea using the following specification:

$$Cash_{i,j}/Assets_i = a + b_1 \, CF_i + b_2 \, CF_i \times AFTER + b_3 \, CF_{not \, i} + b_4 \, CF_{not \, i} \times AFTER + c \, Controls + e \quad (2)$$

where CF_i is the cash flow from the target firm in year i, and $CF_{not \, i}$ is the cash flows from the acquiring firm's assets other than those coming from the target firm (calculated by subtracting the target's cash flows from the acquiring firm's post-acquisition consolidated cash flows).

Table 8 contains estimates of this equation. These estimates indicate that the sensitivity of the target's cash holdings and investment to acquirer's cash flow (excluding the target's cash flow post acquisition) is not economically or statistically significantly different from zero. These results are not consistent with the notion of cross-subsidization from acquiring to target firms.

The results in Table 8 calculate the acquirer's non-target cash flows as those from the acquirer's consolidated financial statements minus the target's cash flows, which are taken from the unconsolidated financial statements. However, if there is cross-subsidization, cash flows from larger subsidiaries or from subsidiaries with larger sales growth are potentially more likely to be transferred to the target firm subsequent to the acquisitions. To examine this idea, we utilize historical updates (old DVDs) of the *Amadeus* data to identify other subsidiaries of the acquiring firms within two years following the acquisitions. We are able to gather data on such subsidiaries and their cash flows before and after the acquisitions for a subsample of 1,369 of targets.

We provide estimates of the sensitivity of the target firm's cash or investment to its own cash flows as well as to the asset-weighted or sales-growth-weighted cash flows of the other subsidiaries of the acquiring firm in Appendix Table A3. These estimates confirm the results from Table 8, and suggest that other subsidiaries' cash flows do not affect cash or investment behavior in the target firms. Consequently, cross-subsidization does not appear to be the explanation for the changes in cash and investment policies we observe in target firms subsequent to their being acquired.

5.3. Diversifying vs. Related Acquisitions

The issues we consider are similar to those in the internal capital market literature. However, an important difference between our findings for acquisitions and the empirical internal capital markets literature is that our arguments apply to both diversifying and related acquisitions, while the internal capital markets literature focuses on whether diversification leads to efficient or inefficient cross-subsidization. *Zephyr* provides acquirer and target industry classification for 3,465 of the 5,187 deals in our sample. Of these 3,465 deals, 1,902 are in different industries and the remaining 1,563 are in related ones, using a common two-digit primary SIC code to define related industries.[27] While all of our deals are to some degree diversifying since they are kept in separate subsidiaries following the acquisition, presumably the ones in different industries diversify the firm more.

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[27] We rely on *Zephyr* rather than *Amadeus* for industry classifications because its classifications are done at the time of the acquisition while those in *Amadeus* are done at the time the data is downloaded.

Panel A of Appendix Table A4 presents estimates of our equations for diversifying and related mergers separately. In each subsample, following the acquisitions, there are declines in the level of cash, as well as the sensitivities of cash to cash flow and of investment to cash flow. All are statistically significantly different from zero except cash holdings for the diversifying subsample and investment-cash flow sensitivities for the same industry subsample. For all three variables, we cannot reject the hypothesis that the coefficients are equal to one another across subsamples. It appears that the reduction in financial constraints occurs in both diversifying and same industry mergers.[28]

6. Potential Concerns

6.1. Cross-Country Differences

One possible concern with our analysis is that the main sample includes cross-border deals, for which we cannot completely control for institutional differences across countries. For example, countries differ in their restrictions on firms' abilities to move cash from a local subsidiary to a foreign parent, as well as many aspects of their tax system. We do not have data on the exact treatment of subsidiaries' cash across countries. However, in Panel A of Table 9, we re-estimate the equations from Tables 3, 4, and 5 including the difference in corporate tax rates as a control, and find similar results to those reported above. One difference is that the change in the investment ratio is still positive but no longer statistically significant. If we, however, include other firm level controls as in the specification in Column (4) of Table 5, this coefficient is significant at the 5% level.[29]

In addition, we re-estimate these equations on the subsample including only domestic acquisitions since these deals are not subject to these international concerns. We report these estimates in Panel B of Table 9. The estimated coefficients that reflect constraints are similar to the earlier ones using the entire sample and they are all statistically significantly different from zero at least the 5% level. These results

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[28] An important caveat is that we have information on only the main industry of the acquirer or the target. Therefore, we identify diversifying mergers with potential error since we do not know whether other subsidiaries within the acquirer are in the same industry as the target.

[29] We do not report that specification to save space but it is available from the authors on request.

suggest that the results reported above do not occur because of international factors affecting cross-border acquisitions.

6.2. Matched Sample of Firms that were Not Acquired

While we have documented changes in the financial policies of target firms consistent with constraints being relieved, it is impossible to know definitively whether these policies would have changed even if the target firms had not been not acquired. We can, however, observe the policies of firms that were not acquired but are similar to the target firms. Presumably, any unobservable factors unrelated to the acquisition that could have affected financial policies in the target would have affected financial policies in these similar firms as well. Therefore, estimating whether the target firms' acquisitions coincided with changes in the financial policies of the matched firms provides a "placebo" test of whether there are other factors we do not control for that influence financial policies at the target firms.

To construct a sample of firms similar to the target firms, we match each target firm with the firm on *Amadeus* from the same country and two-digit industry code as the target firm with as close as a book value of assets as possible one year prior to the acquisition. We require that the matching firm has nonmissing financial data for at least one year before and one year after the merger, and has assets no more than 20% different from that of the target firm prior to the merger. We are able to find matched firms meeting these criteria for 5,012 of the target firms in our sample.

For our placebo test, we estimate equations similar to those in Tables 3, 4 and 5 on the sample of matched firms rather than target firms. We present these estimates in Table 10. The results in this table are in sharp contrast to those for the target firms. The estimates in the first column do predict a decline in cash for the matching firms, but it is less than one-tenth of that for the target firms (.11% compared to 1.4%) and is not statistically significantly different from zero. While there is a significant increase in investment for the target firms, there is a significant *decrease* in investment for the matched firms. Both the cash flow sensitivities of cash and of investment are significantly positive for the matched firms prior to the "acquisition". However, neither sensitivity declines significantly for the matched firms like they do

for the target firms. Overall, the placebo tests imply that the matched firms do not experience any of the changes in the financial policies indicative of a decline in financial constraints.

Finally, we re-estimate the equations from Tables 3, 4 and 5 using the combined samples of target and matched firms. In each equation, the "after" dummy is set equal to one only if the firm is a target firm and the year is subsequent to the acquisition, and always equals zero for the matching firms. The results, presented in Appendix Table A5, are very similar to those reported in Tables 3, 4 and 5: Cash levels decline and investment increases following the acquisition. In addition, both the cash flow sensitivities of cash and of investment are significantly positive prior to the acquisition, and both decline significantly following it.

6.3. Managerial Risk Aversion

One possible explanation for our findings is that target managers could be replaced at the time of the acquisition by less risk-averse ones. Equivalently, if target managers are not replaced following the acquisition, they could behave in a less risk-averse manner because their ownership declines when their firms are acquired. We cannot evaluate this hypothesis directly, since we do not know the identity of the managers of our firms. If acquisitions did lead to less risk-averse managers, the implications would be similar to acquisitions lowering financial constraints, since less risk-averse managers would likely apply lower discount rates to investment projects and act as if they were less financially constrained.

We can test this possibility indirectly, however, since changes in managers' risk aversion is likely to be a function of changes in the firm's ownership distribution. Shareholders of the target are likely to be more risk averse, because of their lack of diversification, relative to the shareholders of the acquiring company. If so, and if the control change is associated with a reduction in risk aversion, the change in ownership could lead to the observed change in financial management policies we have documented.

Using data on ownership, we utilize the change in insider ownership of target firms as a proxy for the risk aversion of managers reflected in their lack of diversification. To do so, we create a variable designed to measure the "independence" of a firm, which takes a value of zero if a company has a shareholder with a total (direct or indirect) ownership of over 50%; one if a company has no shareholder

with more than 50% but has one or more shareholders with an ownership percentage of above 25%; two if none of the shareholders have more than 25% of direct or total ownership; and three if a company is publicly-traded and have missing independence indicator as defined above. We calculate this variable for up to two years before and after the acquisition for our targets whenever the data is available. [30]

Unfortunately, this variable is available for only a subset of our targets.[31] Nevertheless, we could identify targets for which we observe either no change in their independence level (1,066 targets) or a decrease in their independence levels (111 targets). In Panel B of Appendix Table A4, we present our main results for this subsample of 1,177 targets, for which there is likely *no* increase in risk aversion. Our results remain similar to those reported elsewhere in the paper despite the significant drop in the number of observations. In the same Panel B of Appendix Table A4, we also present results for a larger subsample of targets, for which we exclude acquisitions of private targets by public acquirers. Again, the results remain similar to those reported elsewhere in the paper. These findings suggest that the paper's main findings do not reflect cases in which managers' risk aversion is likely to have decreased following the acquisitions; instead, they likely occur because of reductions in financial constraints in target firms.

6.4. Changes in Target Size

A potential issue of concern is that even if *Amadeus* calls a subsidiary of a new parent the same name and gives it the same identifier as a pre-acquisition firm, the assets of the subsidiary could be nonetheless different. Such differences in assets could occur if the new parent reallocates assets, either moving some of the target's assets to another part of the firm, adding some of the parent's other assets to the target, or even potentially both adding and subtracting assets from the target simultaneously. While this issue could only explain the results if the errors were systematic and we know of no reason why they

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[30] We repeated the analysis comparing the "independence" level of the target and the acquirer up to two years before the acquisition and get similar results. However, the statistical significance on some cash or investment sensitivity results disappears due to a substantial drop in the number of observations because of missing acquirer data.

[31] The current version of the Amadeus data set includes only the latest available information on firms' ownership information. We used 2002, 2005, and 2008 versions of the database to acquire historical information on shareholders of a subsample of our targets.

would be, it still would be comforting to know that the assets in the subsidiaries are basically the same as those in the original target firm.

In Appendix Table A6, we re-estimate our equations eliminating observations where the number of employees changes by more than 10% in the two years following the acquisition. This criterion is much more strict than the one we used to construct the main sample, in which the number of employees could change by up to 100% with the firm remaining in the sample. Nonetheless, the results are similar to those reported in Tables 3, 4, and 5, except that the reduction in investment-cash flow sensitivity is not statistically significantly different from zero. These tests suggest that dramatic changes in the assets of target firms following the acquisition are not an important determinant of our results.

6.5. Changes in in the Book Value of Assets

Another potential issue of concern is that there could be changes in the book value of the target firm's assets around the time of acquisitions, affecting the regressions reported above. Assets could change if the acquisitions involve stepping up the assets' basis, or if the acquisitions are associated with high growth, as suggested by the finding that acquisitions are followed by higher investment. Since we use the book value of assets to scale many of the variables we use throughout the analyses, we want to ensure that the findings we report are driven by the changes in cash holdings and investment and not by changes in the book value of assets.

To address this concern, we first re-estimate our equations eliminating the year immediately following the acquisition from the estimation as well as the year of the acquisition (which is not included in any equation reported in the paper). Eliminating these observations ensures that any accounting (or other) changes occurring because of these changes are not the explanation for our results. We report the specifications used in Tables 3, 4, and 5 in Appendix Table A7. The results reported in these tables are similar to those reported in Tables 3, 4 and 5.

Second, we reestimate the equations scaling *all* variables by assets in the year prior to the acquisition, rather than the value of assets contemporaneously. We report these equations in Appendix Table A8. Again, the results are similar to those reported in Tables 3, 4, and 5. The results in Appendix

Tables A7 and A8 strongly suggest that the findings reported above are driven by the changes in cash and investment as a function of financial constraints, and not by changes in the book value of assets that are used to normalize these variables.

6.6. Potential Selection Issues.

One potential selection concern comes from the way in which *Amadeus* is constructed and our sampling process. *Amadeus* has a maximum of ten years of data per firm, so for our sample, firms typically have data from 2000-2009.[32] Our data construction process uses all available firm-years in our analysis. This process maximizes our sample size, but leads to an unbalanced structuring of the before-acquisition and after-acquisition observations. In particular, an acquisition later in the sample period will have a larger number of pre-acquisition observations while an acquisition earlier in the sample period will have a larger number of post-acquisition observations.

While we do not know of any particular bias this selection process will cause in our results, and we do include year-specific fixed effects that will adjust for any specific macroeconomic shocks, we would like to ensure that this admittedly unusual data construction procedure is not somehow an important determinant of our results. Therefore we re-estimate the equations presented in Tables 3, 4 and 5 using several alternative samples. First, we restrict the sample to firm-years no more than three years away from the acquisition, and present these results in Panel A of Appendix Table A9. Second we restrict the sample to firm-years no more than five years away from the acquisition and present those results in Panel B of Appendix Table A9. The estimates reported in all panels of Appendix Table A9 are similar to those reported in Tables 3, 4, and 5. Therefore, the basic conclusion that financial constraints decline around the time of acquisitions does not appear to be driven by the sampling approach used in our main tables.

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[32] For firms that disappeared prior to 2009, *Amadeus* keeps earlier data. For example, if a firm disappeared from *Amadeus* in 2004, it could potentially have data starting in 1995. We have generally followed the rule of "keep and use all data" but have re-estimated all equations using just post-2000 data with almost identical results to those reported in the paper.

7. Conclusion

Managers often justify acquisitions with the logic that they can add value to targets by facilitating the target's ability to invest efficiently. If being acquired leads to a reduction in financial constraints, then the target firm effectively faces a lower cost of capital, and is potentially able to undertake more valuable investments. However, examining this view empirically is difficult, since for most acquisitions, one cannot observe data on target firms on subsequent to being acquired. Because of disclosure requirements in European countries, we are able to construct a sample of European acquisitions containing financial data on target firms both before and after the acquisitions. We use this sample to test the hypothesis that target firms' financial constraints are lowered subsequent to acquisitions.

Our approach is to evaluate whether the financial management decisions of target firms change when their firm is acquired in ways consistent with their becoming less financially constrained. Theory suggests that financial constraints should lead managers to increase cash holdings, to increase the cash flow sensitivity of cash as well as the cash flow sensitivity of investment, and to decrease investment. If constraints are eased when a firm is acquired, then these effects should be reversed. In our sample, we document that subsequent to an acquisition, managers do in fact lower their cash holdings, lower the sensitivity of cash holdings to cash flow, lower the sensitivity of investment to cash flow, and increase the quantity of their investments. These results are consistent with the view that financial constraints are lowered for target firms when they are acquired. Lowering these constraints can lead target firms to undertake more positive net present value investments, and consequently provide a potential motive for the acquisition.

We document that these effects are most important in deals for which one would expect financial constraints to be relatively important. In particular, the reduction in financial constraints appears to be more important for targets that were independent firms prior to the acquisition and for smaller targets. In addition, the reduction in financial constraints occurs in both diversifying and same-industry acquisitions. This cross-deal pattern of empirical results suggests that they reflect reductions in financial constraints rather than other factors.

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It seems likely that financial synergies resulting from reductions in financial constraints could motivate some acquisitions, or even induce managers to take value-decreasing acquisitions. While we emphasize that while a reduction in financial constraints could potentially be a factor leading to acquisitions, it is not likely to be the only factor. Substantial evidence indicates that operational synergies and wealth transfers are also important determinants of acquisitions. From our results, it is impossible to quantify the relative importance of financing motivations compared to other factors. Doing so would greatly add to our understanding of why certain firms combine with others.

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Table 1. Statistics on the acquisition sample across time

This table displays statistics on European targets from 2001 to 2008. The sample includes acquisitions of European targets, reported by the *Zephyr* database*,* with at least one year of financial data available (in *Amadeus*) before and after the acquisition. Financial firms, firms with less than 10 employees, and firms with the total asset size less than 1 Million USD are excluded. The table presents the characteristics of acquisitions tabulated by the deal completion year. The total assets of target firms are the averages of the last two years before the merger. Statistics in the last four columns are as of the last fiscal year-end before the deal is completed. Variable definitions are provided in the Data Appendix.

Deal Completion Year	No of Deals	Target's Total Assets before the Acquisition (USD Million)		Domestic Deals (%)	Independent Targets (%)	Private Targets (%)	Public Acquirer (%)
		Mean	Median				
2001	228	76.850	7.233	62.95	72.81	95.18	46.05
2002	393	125.500	7.665	59.07	69.72	96.69	44.27
2003	429	57.448	7.528	61.20	62.47	97.20	29.37
2004	603	78.870	7.952	62.35	69.98	97.18	38.47
2005	768	94.849	8.628	63.53	67.97	97.40	36.72
2006	999	49.298	7.210	60.20	68.77	97.70	35.34
2007	1270	38.377	7.270	65.51	77.48	97.72	34.96
2008	497	83.230	7.453	67.58	78.47	97.59	31.59
Total	5187	67.716	7.578	63.05	71.58	97.36	36.11

Table 2. Summary statistics on the financial variables of the targets and acquirers

This table presents summary statistics for the accounting variables of the targets and acquirers as averages of the last two years before and after the acquisition. All firm-level data are from *Amadeus*. Statistics are based on unconsolidated financial statements for the targets and consolidated financial statements for the acquirers. Variable definitions are provided in the Data Appendix. *Total assets* are in USD Million. We assess the differences in means using the mean difference test and medians using the Wilcoxon-Mann-Whitney test. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	Target							
	Before				**After**			
	Obs.	mean	sd	median	Obs.	mean	sd	median
Total Assets	5187	67.716	622.835	7.578	5187	88.993	945.946	9.717***
Number of Employees	4121	282.901	1741.023	76.500	4363	256.792	1919.958	69.000***
Cash/Total Assets	5002	0.122	0.145	0.064	4936	0.103***	0.127	0.054***
Gross Investment/Total Assets	4148	0.064	0.107	0.034	4484	0.062	0.118	0.027***
Cash Flows/Total Assets	4305	0.077	0.139	0.082	4413	0.068**	0.151	0.073***
ROA	4126	0.110	0.154	0.109	4270	0.093***	0.168	0.094***
Sales Growth	2464	0.133	0.344	0.068	2663	0.131	0.433	0.058***
Leverage	4541	0.577	0.229	0.594	4341	0.552***	0.241	0.564***

	Acquirer							
	Before				**After**			
	Obs.	mean	sd	median	Obs.	mean	sd	median
Total Assets	1429	2438.834	11215.136	172.891	1504	3394.176*	14144.267	281.863***
Number of Employees	1318	7837.190	23942.573	885.000	1404	9114.769	29737.385	1057.250***
Cash/Total Assets	1406	0.098	0.100	0.063	1492	0.077***	0.077	0.050***
Gross Investment/Total Assets	1144	0.120	0.146	0.081	1029	0.099**	0.152	0.059***
Cash Flows/Total Assets	1262	0.079	0.072	0.078	1344	0.067***	0.071	0.069***
ROA	1352	0.096	0.075	0.089	1423	0.083***	0.071	0.078***
Sales Growth	807	0.201	0.425	0.108	725	0.133**	0.387	0.080***
Leverage	1385	0.492	0.180	0.494	1475	0.523***	0.178	0.528***

Table 3. The effect of acquisitions on cash holdings of target and acquirer firms

This table presents estimates of equations predicting cash holding normalized by total assets, for target firms in Column (1) through (4) and acquirer firms in Column (5) through (8). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. The estimates are based on unconsolidated data for the targets and consolidated data for the acquirers. The definition and sources of other variables are provided in the Data Appendix. Firm and year fixed effects are included in all equations. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A: TARGET				Panel B: ACQUIRER			
AFTER	-0.0173***	-0.0139***	-0.0135***	-0.0145***	-0.0164***	-0.0136***	-0.0140***	-0.0077
	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)	(0.006)
Ln(Total Assets)	0.0304	0.0160	0.0151	0.0514	-0.0155	-0.0270	-0.0318	0.0495
	(0.022)	(0.023)	(0.027)	(0.039)	(0.023)	(0.025)	(0.024)	(0.044)
Ln(Total Assets)^2	-0.0012*	-0.0008	-0.0008	-0.0016	-0.0000	0.0002	0.0004	-0.0012
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cash Flow/Total Assets		0.0931***		0.0637***		0.0924***		0.1120***
		(0.008)		(0.015)		(0.026)		(0.040)
ROA			0.0945***				0.0490*	
			(0.008)				(0.030)	
Ln(Number of Employees)				-0.0140***				-0.0113
				(0.005)				(0.008)
Sales Growth				-0.0004				-0.0078
				(0.003)				(0.006)
Leverage				-0.0892***				-0.1050***
				(0.011)				(0.032)
Private Credit/GDP	-0.0239***	-0.0183**	-0.0162*	-0.0202*	-0.0284**	-0.0284**	-0.0271**	-0.0358*
	(0.008)	(0.009)	(0.009)	(0.012)	(0.011)	(0.013)	(0.012)	(0.019)
Market Cap/GDP	0.0007	0.0015	-0.0040	-0.0039	0.0161**	0.0163*	0.0148*	0.0159
	(0.005)	(0.005)	(0.006)	(0.009)	(0.008)	(0.009)	(0.008)	(0.017)
GDP Growth	-0.0028	-0.0042	0.0317	0.1171	-0.0393	-0.0886	-0.0739	-0.1978
	(0.015)	(0.015)	(0.041)	(0.071)	(0.075)	(0.064)	(0.060)	(0.174)
Constant	-0.0600	0.0411	0.0616	-0.1830	0.4757**	0.5435**	0.5876**	-0.2503
	(0.178)	(0.189)	(0.221)	(0.329)	(0.225)	(0.242)	(0.240)	(0.454)
Observations	34,378	29,018	27,793	11,941	9,662	8,252	8,895	3,128
R-squared	0.607	0.628	0.623	0.672	0.648	0.660	0.664	0.740

Table 4. The effect of acquisitions on the cash-cash flow and investment-cash flow sensitivities of target firms

This table presents estimates of equations in which the dependent variables are the changes in the ratio of cash holdings to total assets in Column (1) through (2), and gross investment normalized by total assets in Column (3) through (4). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. We also include its interaction with cash flows to examine the change in the sensitivities subsequent to the acquisitions. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable	Δ(Cash/Total Assets)		Gross Investment/Total Assets	
AFTER	-0.0138***	-0.0104**	0.0218***	0.0247***
	(0.003)	(0.004)	(0.004)	(0.006)
Cash Flow/Total Assets	0.0741***	0.1036***	0.0818***	0.0713**
	(0.013)	(0.025)	(0.016)	(0.028)
AFTER x Cash Flow	-0.0590***	-0.0929***	-0.0436**	-0.0563*
	(0.017)	(0.029)	(0.018)	(0.033)
Ln(Total Assets)	-0.0277	-0.0251	0.0134	-0.0058
	(0.019)	(0.031)	(0.037)	(0.057)
Ln(Total Assets)^2	0.0010*	0.0009	0.0007	0.0019
	(0.001)	(0.001)	(0.001)	(0.002)
Ln(Number of Employees)		-0.0020		-0.0196***
		(0.004)		(0.007)
Sales Growth		-0.0030		0.0310***
		(0.004)		(0.005)
Leverage		-0.0098		0.0224*
		(0.009)		(0.013)
Private Credit/GDP	-0.0036	0.0025	-0.0163	-0.0222
	(0.007)	(0.008)	(0.010)	(0.015)
Market Cap/GDP	-0.0048	-0.0107	-0.0117	-0.0064
	(0.006)	(0.009)	(0.008)	(0.012)
GDP Growth	-0.0192	0.0421	0.1330***	0.1183
	(0.021)	(0.063)	(0.042)	(0.138)
Constant	0.2055	0.1906	-0.2733	-0.2925
	(0.161)	(0.269)	(0.302)	(0.466)
Observations	23,668	11,632	25,591	12,138
R-squared	0.159	0.195	0.320	0.368

Table 5. The effect of acquisitions on investments of target firms

This table presents estimates of equations in which the dependent variables are gross investment normalized by total assets. AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable :	Gross Investment/Total Assets			
AFTER	0.0161***	0.0184***	0.0156***	0.0201***
	(0.004)	(0.004)	(0.004)	(0.005)
Ln(Total Assets)	0.0187	0.0087	0.0006	-0.0140
	(0.036)	(0.037)	(0.040)	(0.056)
Ln(Total Assets)^2	0.0006	0.0009	0.0012	0.0021
	(0.001)	(0.001)	(0.001)	(0.002)
Cash Flow/Total Assets		0.0587***		0.0411**
		(0.011)		(0.019)
ROA			0.0218**	
			(0.010)	
Ln(Number of Employees)				-0.0203***
				(0.007)
Sales Growth				0.0308***
				(0.005)
Leverage				0.0232*
				(0.012)
Private Credit/GDP	-0.0159	-0.0166	-0.0144	-0.0214
	(0.010)	(0.010)	(0.010)	(0.015)
Market Cap/GDP	-0.0092	-0.0108	-0.0032	-0.0057
	(0.007)	(0.008)	(0.008)	(0.012)
GDP Growth	0.1222***	0.1299***	0.2229***	0.1141
	(0.042)	(0.042)	(0.072)	(0.139)
Constant	-0.3169	-0.2272	-0.2712	-0.2155
	(0.292)	(0.302)	(0.327)	(0.463)
Observations	27,322	25,591	24,434	12,138
R-squared	0.315	0.319	0.330	0.367

Table 6. Subsamples of target firms

This table presents estimates of equations from Tables 3, 4, and 5 for subsamples based on target-firm characteristics. Panel A examines subsamples of independent targets and targets as subsidiaries of other firms. Panel B divides the sample of acquisitions into terciles based on the size of the target firm (calculated as the average of assets for the last available two years). The dependent variables are cash holdings normalized by total assets in Columns (1) and (5), changes in cash holdings in Column (2) and (6), and gross investment normalized by total assets in Columns (3), (4), (7), and (8). The regression specifications follow Column (2) in Table 3, Columns (1) and (3) in Table 4, and Column (2) in Table 5. The coefficients on size variables and two country-level variables are not reported to save space. AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. We also include the interaction of AFTER with cash flows to examine the change in the sensitivities post acquisitions. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Panel A. Independent vs. Subsidiary targets

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	INDEPENDENT				SUBSIDIARY			
Dependent Variable :	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0183***	-0.0135***	0.0215***	0.0170***	-0.0030	-0.0129**	0.0227***	0.0212***
	(0.004)	(0.004)	(0.005)	(0.004)	(0.006)	(0.005)	(0.007)	(0.007)
Cash Flow/Total Assets	0.0995***	0.0903***	0.0899***	0.0609***	0.0761***	0.0417**	0.0609**	0.0488**
	(0.010)	(0.018)	(0.019)	(0.013)	(0.013)	(0.016)	(0.029)	(0.021)
AFTER x Cash Flow		-0.0822***	-0.0520**			-0.0092	-0.0251	
		(0.021)	(0.022)			(0.028)	(0.034)	
Constant	-0.0587	0.2649	-0.0361	0.0244	0.1505	-0.1216	-1.3396***	-1.3195***
	(0.208)	(0.198)	(0.383)	(0.382)	(0.413)	(0.308)	(0.500)	(0.500)
Observations	20,569	16,777	18,129	18,129	8,449	6,891	7,462	7,462
R-squared	0.634	0.167	0.331	0.330	0.608	0.143	0.299	0.299

Panel B. Target Size

Dependent Variable :	(1) SMALL (bottom 1/3) Cash/Asset	(2) Δ(Cash/Asset)	(3) Inv/Asset	(4) Inv/Asset	(5) LARGE (top 1/3) Cash/Asset	(6) Δ(Cash/Asset)	(7) Inv/Asset	(8) Inv/Asset
AFTER	-0.0242***	-0.0207***	0.0274***	0.0204***	-0.0032	-0.0080**	0.0151**	0.0145**
	(0.007)	(0.007)	(0.008)	(0.007)	(0.005)	(0.004)	(0.007)	(0.006)
Cash Flow/Total Assets	0.1199***	0.1177***	0.0905***	0.0462**	0.0555***	0.0245	0.0816***	0.0767***
	(0.015)	(0.028)	(0.027)	(0.019)	(0.012)	(0.016)	(0.031)	(0.022)
AFTER x Cash Flow		-0.0729**	-0.0777**			-0.0340	-0.0098	
		(0.032)	(0.031)			(0.025)	(0.034)	
Constant	-0.5883	0.7212	-2.1973**	-2.0904**	0.5494**	-0.0537	0.1910	0.1915
	(1.077)	(0.960)	(1.076)	(1.065)	(0.276)	(0.230)	(0.580)	(0.581)
Observations	8,059	6,422	7,156	7,156	10,813	8,921	9,450	9,450
R-squared	0.628	0.208	0.341	0.340	0.591	0.118	0.301	0.301

Table 7. The effect of acquisitions on the cash-cash flow and investment-cash flow sensitivities of acquirer firms

This table presents estimates of panel equations in which the dependent variables are the changes in the ratio of the acquirer's cash holdings to total assets in Column (1) through (2) and the acquirer's gross investment normalized by total assets in Column (3) through (4). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. The definition and sources of other variables are provided in the Data Appendix. Acquirer-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the acquirer-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable	Δ(Cash/Total Assets)		Gross Investment/Total Assets	
AFTER	0.0041	0.0013	-0.0287**	-0.0339**
	(0.006)	(0.007)	(0.013)	(0.016)
Cash Flow/Total Assets	0.0864**	0.0845	0.1232*	0.0734
	(0.035)	(0.056)	(0.065)	(0.102)
AFTER x Cash Flow	-0.0482	-0.0676	0.0252	0.0312
	(0.046)	(0.056)	(0.087)	(0.111)
Ln(Total Assets)	0.0194	0.0224	0.0096	0.1550*
	(0.024)	(0.031)	(0.087)	(0.094)
Ln(Total Assets)^2	-0.0006	-0.0005	0.0019	-0.0007
	(0.001)	(0.001)	(0.002)	(0.003)
Ln(Number of Employees)		-0.0088*		-0.0449**
		(0.005)		(0.017)
Sales Growth		-0.0094		0.1098***
		(0.007)		(0.023)
Leverage		0.0033		0.0545
		(0.022)		(0.058)
Private Credit/GDP	-0.0040	-0.0109	0.0052	0.0231
	(0.012)	(0.015)	(0.029)	(0.034)
Market Cap/GDP	-0.0159	0.0000	-0.0293	-0.0521
	(0.012)	(0.012)	(0.024)	(0.032)
GDP Growth	-0.1140	0.0801	0.2900	0.4159
	(0.096)	(0.185)	(0.245)	(0.505)
Constant	-0.1619	-0.1746	-0.5516	-2.4146***
	(0.245)	(0.337)	(0.848)	(0.874)
Observations	5,531	3,113	5,610	3,110
R-squared	0.177	0.194	0.352	0.385

Table 8. Cross-subsidization between target and acquirer firms subsequent to the acquisition

This table presents estimates of equations in which the dependent variables are the changes in the ratio of the target firm's cash holdings to total assets in Column (1) through (2) and changes in the target firm's gross investment normalized by total assets in Column (3) through (4). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. Target Cash Flow is the cash flow of the target firm and Acquirer Cash Flow is the consolidated cash flow of the acquiring minus the cash flow coming from the target firm. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the acquirer-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Dependent Variable	(1)	(2)	(3)	(4)
	Target		Target	
	Δ(Cash/Total Assets)		Gross Investment/Total Assets	
AFTER	-0.0178***	-0.0230**	0.0203**	0.0195
	(0.007)	(0.009)	(0.008)	(0.013)
Target Cash Flow	0.0814***	0.0873**	0.1063***	0.0758
	(0.026)	(0.041)	(0.037)	(0.056)
AFTER x Target Cash Flow	-0.0329	-0.0533	-0.0890**	-0.1200**
	(0.034)	(0.048)	(0.041)	(0.061)
Acquirer Cash Flow	0.0026*	-0.0398	0.0015	-0.0409
	(0.001)	(0.048)	(0.002)	(0.067)
AFTER x Acquirer Cash Flow	0.0304	0.0270	-0.0124	0.0075
	(0.020)	(0.052)	(0.027)	(0.077)
Ln(Total Assets)	-0.0103	-0.0730	0.1367*	0.0744
	(0.049)	(0.063)	(0.078)	(0.086)
Ln(Total Assets)2	0.0004	0.0020	-0.0028	-0.0003
	(0.001)	(0.002)	(0.002)	(0.003)
Ln(Number of Employees)		0.0072		-0.0197
		(0.009)		(0.012)
Sales Growth		0.0089		0.0279***
		(0.009)		(0.010)
Leverage		-0.0164		0.0408
		(0.020)		(0.028)
Private Credit/GDP	-0.0208	-0.0182	-0.0038	-0.0125
	(0.015)	(0.017)	(0.022)	(0.026)
Market Cap/GDP	-0.0197	-0.0274	0.0015	-0.0092
	(0.014)	(0.018)	(0.015)	(0.021)
GDP Growth	0.0034	-0.0094	0.2669*	0.2845*
	(0.098)	(0.127)	(0.147)	(0.165)
Constant	0.1229	0.7035	-1.4575**	-1.0381
	(0.416)	(0.548)	(0.639)	(0.715)
Observations	5,599	3,055	6,028	3,171
R-squared	0.203	0.243	0.396	0.424

Table 9. Acquisitions and financial constraints: International considerations

This table presents estimates of equations from Tables 3, 4, and 5, with the difference in corporate tax rates between target and acquiring countries as an additional control variable in Panel A and using the sample of domestic targets only in Panel B. The dependent variables are cash holdings normalized by total assets in Column (1) and (5), gross investment normalized by total assets in Column (2), (4), (6), and (8), and changes in cash holdings in Column (3) and (7). The definition and sources of variables are provided in the Data Appendix. Year fixed effects are included in Panel A and target-firm and year fixed effects are included in Panel B. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Panel A. Difference in corporate tax rates				Panel B. Domestic targets			
Dependent Variable	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0189***	-0.0042**	0.0061*	0.0011	-0.0194***	-0.0174***	0.0262***	0.0212***
	(0.004)	(0.002)	(0.003)	(0.003)	(0.004)	(0.004)	(0.005)	(0.005)
Cash Flow/Total Assets	0.1499***	0.0562***	0.1008***	0.0686***	0.0875***	0.0605***	0.0921***	0.0587***
	(0.011)	(0.009)	(0.013)	(0.009)	(0.011)	(0.016)	(0.021)	(0.015)
AFTER x Cash Flow		-0.0415***	-0.0600***			-0.0520**	-0.0626**	
		(0.013)	(0.016)			(0.022)	(0.024)	
Ln(Total Assets)	-0.0977***	0.0043	0.0033	0.0012	-0.0026	-0.0572**	0.0671	0.0585
	(0.013)	(0.005)	(0.012)	(0.012)	(0.031)	(0.023)	(0.051)	(0.051)
Ln(Total Assets)^2	0.0023***	-0.0001	0.0000	0.0001	-0.0003	0.0018***	-0.0007	-0.0005
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)	(0.002)
Private Credit/GDP	-0.0113*	0.0032	-0.0019	-0.0020	-0.0187	0.0075	-0.0261*	-0.0264*
	(0.006)	(0.003)	(0.005)	(0.005)	(0.012)	(0.009)	(0.014)	(0.014)
Market Cap/GDP	0.0355***	-0.0037	-0.0020	-0.0017	0.0020	-0.0066	-0.0057	-0.0044
	(0.006)	(0.002)	(0.005)	(0.005)	(0.007)	(0.007)	(0.010)	(0.010)
GDP Growth	0.0071	-0.1176***	0.1901***	0.1910***	-0.0131	-0.0416	0.1017*	0.0985*
	(0.079)	(0.038)	(0.068)	(0.068)	(0.017)	(0.026)	(0.055)	(0.055)
Diff_Corptax	-0.1070***	-0.0075	0.0320	0.0317				
	(0.029)	(0.009)	(0.020)	(0.020)				
Constant	1.0299***	-0.0422	-0.0123	0.0098	0.2274	0.4656**	-0.8408**	-0.7604*
	(0.115)	(0.041)	(0.101)	(0.100)	(0.250)	(0.199)	(0.417)	(0.415)
Observations	22,450	18,317	19,968	19,968	17,831	14,525	15,776	15,776
R-squared	0.085	0.007	0.016	0.015	0.630	0.159	0.320	0.319

Table 10. Placebo test: Matched sample

This table presents estimates of our basic regressions in Table 3, Table 4, and Table 5 using the sample of industry-size-country matched firms. For each target firm, we find a matched firm on *Amadeus* from the same country and two-digit industry code that had the closest total assets at the year prior to the acquisition. We require that the matching firm has non-missing financial data for at least one year before and one year after the merger. We drop the matched firms for which the difference in total assets between the target and matched firms is above 20% of the target firm's total assets. The dependent variables are cash holdings normalized by total assets in Column (1), gross investment normalized by total assets in Column (2) and (4), and changes in cash holdings in Column (3). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition of target firms to which the firm is matched. The definition and sources of variables are provided in the Data Appendix. Firm and year fixed effects are included. Standard errors are corrected for clustering of observations at the firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable:	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0011	0.0019	-0.0032	-0.0060*
	(0.003)	(0.004)	(0.004)	(0.003)
Cash Flow/Total Assets	0.1199***	0.1220***	0.0679***	0.0509***
	(0.011)	(0.019)	(0.018)	(0.014)
AFTER x Cash Flow		-0.0347	-0.0344	
		(0.023)	(0.021)	
Ln(Total Assets)	0.0375	0.0178	0.0837**	0.0809**
	(0.024)	(0.027)	(0.035)	(0.034)
Ln(Total Assets)^2	-0.0012*	-0.0004	-0.0012	-0.0012
	(0.001)	(0.001)	(0.001)	(0.001)
Private Credit/GDP	-0.0195**	-0.0103	-0.0019	-0.0018
	(0.009)	(0.007)	(0.009)	(0.009)
Market Cap/GDP	0.0037	0.0019	-0.0097	-0.0092
	(0.005)	(0.006)	(0.007)	(0.007)
GDP Growth	0.0207	0.0316	0.1306***	0.1275***
	(0.017)	(0.027)	(0.040)	(0.040)
Constant	-0.1769	-0.1827	-1.0053***	-0.9772***
	(0.199)	(0.224)	(0.287)	(0.287)
Observations	26,202	18,439	23,149	23,149
R-squared	0.717	0.154	0.358	0.358

Appendix Table A1. Statistics on characteristics of acquisitions across targets' countries

This table displays statistics on European targets from 2001 to 2008. The sample includes acquisitions of European targets, reported by the *Zephyr* database, with at least one year of financial data available (in *Amadeus*) before and after the acquisition. Financial firms, firms with less than 10 employees, and firms with the total asset size less than 1 Million USD are excluded. The table presents the characteristics tabulated by the countries with at least 10 target firms in our sample period. The total assets of target firms are the averages of the last two years before the merger. Statistics in the last four columns are as of the last fiscal year-end before the deal is completed. Variable definitions are provided in the Data Appendix.

| Target Country | No of Deals | Target's Total Assets before the Acquisition (USD Million) | | Domestic Deals (%) | Independent Targets (%) | Private Targets (%) | Public Acquirer (%) |
		Mean	Median				
AUSTRIA	22	13.495	6.670	36.36	54.55	100.00	50.00
BELGIUM	248	29.653	8.252	49.79	75.40	98.79	31.85
BULGARIA	14	10.142	6.184	16.67	71.43	85.71	21.43
CROATIA	28	15.956	9.327	57.14	64.29	96.43	35.71
CZECH REPUBLIC	52	70.786	12.523	31.37	78.85	96.15	38.46
DENMARK	100	25.982	7.726	43.00	72.00	100.00	31.00
ESTONIA	17	7.031	3.644	58.82	47.06	100.00	23.53
FINLAND	215	58.198	4.532	64.49	65.58	98.14	27.44
FRANCE	748	45.271	7.365	67.17	68.32	97.86	35.03
GERMANY	286	71.027	12.390	43.82	60.49	98.60	40.21
GREECE	19	16.533	9.612	76.47	63.16	89.47	68.42
IRELAND	21	9.742	5.172	52.38	85.71	100.00	23.81
ITALY	282	69.915	20.927	60.29	65.96	99.29	36.88
LATVIA	25	6.306	3.891	28.00	80.00	96.00	16.00
NETHERLANDS	252	43.137	6.340	59.04	69.05	97.62	24.21
NORWAY	182	31.894	5.224	57.47	78.57	94.51	34.62
POLAND	74	38.969	10.908	38.89	66.22	95.95	52.70
PORTUGAL	62	40.755	14.514	45.16	66.13	98.39	32.26
ROMANIA	21	48.785	6.612	28.57	80.95	100.00	38.10
RUSSIAN FEDERATION	317	96.890	8.200	87.13	76.66	94.01	23.97
SLOVAKIA	13	12.333	6.279	15.38	84.62	84.62	46.15
SPAIN	343	35.608	10.450	69.32	69.97	98.83	24.78
SWEDEN	305	27.908	5.500	57.62	67.54	95.08	40.33
UKRAINE	14	22.511	4.521	71.43	78.57	100.00	7.14
UNITED KINGDOM	1527	114.276	6.865	70.38	76.56	97.38	43.94
Total	5187	67.716	7.578	63.05	71.58	97.36	36.11

Appendix Table A2. The effect of acquisitions on the cash holdings of acquirer firms adjusted for the deal value

This table presents estimates of our basic regressions in Panel B of Table 3 but adjusts the dependent variable (the ratio of cash holdings of acquirer firms) for the deal value in the year after the acquisition by adding the deal value to cash holdings. The observations without deal value information are dropped from the sample. AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. The definition and sources of other variables are provided in the Data Appendix. Acquirer-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the acquirer-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable:	Acquirer's Cash Holdings adjusted for Deal Value			
AFTER	-0.0126*	-0.0123	-0.0131*	-0.0122
	(0.007)	(0.008)	(0.007)	(0.014)
Ln(Total Assets)	-0.0537*	-0.0764**	-0.1032**	-0.0866
	(0.032)	(0.034)	(0.043)	(0.095)
Ln(Total Assets)^2	0.0014*	0.0020**	0.0029**	0.0027
	(0.001)	(0.001)	(0.001)	(0.002)
Cash Flow/Total Assets		0.0930***		0.1545**
		(0.030)		(0.068)
ROA			0.0861**	
			(0.043)	
Ln(Number of Employees)				-0.0088
				(0.011)
Sales Growth				-0.0093
				(0.008)
Leverage				-0.0763*
				(0.044)
Private Credit/GDP	-0.0504***	-0.0526***	-0.0569***	-0.0440
	(0.018)	(0.020)	(0.019)	(0.028)
Market Cap/GDP	0.0217	0.0110	0.0172	-0.0203
	(0.016)	(0.018)	(0.019)	(0.036)
GDP Growth	0.0045	-0.0070	0.0033	0.0688
	(0.037)	(0.042)	(0.083)	(0.133)
Constant	0.6222**	0.8548**	1.0502***	0.8609
	(0.306)	(0.332)	(0.403)	(0.940)
Observations	3,716	3,262	3,181	1,304
R-squared	0.552	0.571	0.561	0.655

Appendix Table A3. Cross-subsidization between target and other size-weighted (sales-growth-weighted) subsidiaries after the acquisition

This table presents estimates of equations in which the dependent variables are the changes in the ratio of the target firm's cash holdings to total assets in Column (1) through (4) and changes in the target's gross investment normalized by total assets in Column (5) through (8). AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. Target Cash Flow is the cash flow of the target firm only and Size-weighted (Sales-growth-weighted) Non-Target Cash Flow is the asset-weighted (sales-growth-weighted) cash flows of the other European subsidiaries of the acquiring firm. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the acquirer-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Target Δ(Cash/Total Assets)				Target Gross Invesment/Total Assets			
AFTER	-0.0113*	-0.0045	-0.0110	-0.0030	0.0158**	0.0305***	0.0263***	0.0337***
	(0.007)	(0.010)	(0.008)	(0.011)	(0.008)	(0.011)	(0.009)	(0.011)
Target Cash Flow	0.0649**	0.1209**	0.1109***	0.1266**	0.0803***	0.0844**	0.0971***	0.1089**
	(0.030)	(0.055)	(0.038)	(0.059)	(0.028)	(0.043)	(0.032)	(0.043)
AFTER x Target Cash Flow	-0.0468	-0.1024*	-0.0953**	-0.1076*	-0.0187	-0.0371	-0.0087	-0.0503
	(0.037)	(0.061)	(0.043)	(0.065)	(0.033)	(0.054)	(0.041)	(0.057)
Size-Weighted Non-target Cash Flow	0.0398	-0.0068			0.0222	0.0481		
	(0.058)	(0.076)			(0.057)	(0.092)		
AFTER x Size-weighted Non-target Cash Flow	-0.0056	0.0642			0.0760	0.0195		
	(0.076)	(0.089)			(0.083)	(0.106)		
Sales-growth-weighted Non-target Cash Flow			0.0134	-0.0057			0.0210	0.0309
			(0.020)	(0.021)			(0.021)	(0.022)
AFTER x Sales-growth-weighted Non-target Cash Flow			0.0067	0.0141			-0.0252	-0.0341
			(0.026)	(0.030)			(0.032)	(0.032)
Ln(Total Assets)	-0.0489	-0.0514	-0.0627	-0.0748	0.0524	-0.0403	0.0737	-0.0453
	(0.037)	(0.054)	(0.042)	(0.057)	(0.073)	(0.111)	(0.092)	(0.116)
Ln(Total Assets)2	0.0018	0.0019	0.0021*	0.0026	-0.0006	0.0029	-0.0011	0.0031
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.003)	(0.004)
Ln(Number of Employees)		-0.0032		-0.0033		-0.0245**		-0.0211*
		(0.007)		(0.007)		(0.012)		(0.012)
Sales Growth		-0.0028		-0.0010		0.0287***		0.0285***
		(0.008)		(0.008)		(0.009)		(0.009)
Leverage		-0.0265		-0.0243		0.0400*		0.0466**
		(0.018)		(0.019)		(0.021)		(0.022)
Private Credit/GDP	-0.0139	-0.0274*	-0.0223	-0.0305*	-0.0018	0.0034	-0.0079	-0.0076
	(0.012)	(0.014)	(0.014)	(0.016)	(0.019)	(0.027)	(0.022)	(0.030)
Market Cap/GDP	-0.0041	-0.0166	-0.0035	-0.0178	-0.0002	0.0064	0.0040	0.0122
	(0.013)	(0.019)	(0.016)	(0.020)	(0.014)	(0.023)	(0.017)	(0.025)
GDP Growth	0.0173	0.0503	0.0216	0.0094	0.1730	0.1592	0.1502	0.0776
	(0.057)	(0.108)	(0.080)	(0.133)	(0.111)	(0.258)	(0.155)	(0.295)
Constant	0.3497	0.4128	0.4867	0.5924	-0.6928	-0.0731	-0.9035	-0.0424
	(0.324)	(0.480)	(0.363)	(0.505)	(0.604)	(0.914)	(0.763)	(0.957)
Observations	6,564	3,300	4,936	3,057	7,225	3,469	5,320	3,221
R-squared	0.170	0.208	0.180	0.230	0.348	0.389	0.356	0.400

Appendix Table A4. Subsamples of target firms

This table presents estimates of some equations from Tables 3, 4, and 5 for subsamples based on target-firm characteristics. Panel A compares subsamples of diversifying acquisitions and acquisitions within the same industry, where the industry is classified at the time of acquisition. In columns (1)-(4) of Panel B, we present results for a subset of targets whose independence level either does not change or decreases (becoming more closely held) post acquisitions. In Columns (5)-(8) of Panel B, we present results excluding the subset of acquisitions where the acquirer is a public firm and the target is a private firm. The dependent variables are cash holdings normalized by total assets in Columns (1) and (5), changes in cash holdings in Column (2) and (6), and gross investment normalized by total assets in Columns (3), (4), (7), and (8). The regression specifications follow Column (2) in Table 3, Columns (1) and (3) in Table 4, and Column (2) in Table 5. The coefficients on size variables and two country-level variables are not reported to save space. AFTER is a dummy variable that equals one (zero) for the years after (before) an acquisition. We also include the interaction of AFTER with cash flows to examine the change in the sensitivities post acquisitions. The definition and sources of other variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Panel A. Diversifying vs. Same Industry Acquisition

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	DIVERSIFYING				SAME INDUSTRY			
Dependent Variable :	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0080	-0.0255***	0.0290***	0.0216***	-0.0211***	-0.0202**	0.0340***	0.0304***
	(0.007)	(0.007)	(0.008)	(0.007)	(0.008)	(0.008)	(0.010)	(0.009)
Cash Flow/Total Assets	0.0984***	0.0782***	0.1105***	0.0692***	0.1072***	0.0711***	0.0907***	0.0724***
	(0.013)	(0.021)	(0.025)	(0.018)	(0.017)	(0.027)	(0.031)	(0.025)
AFTER x Cash Flow		-0.0540*	-0.0855***			-0.0891***	-0.0402	
		(0.028)	(0.030)			(0.034)	(0.034)	
Constant	0.1087	0.4412	-0.3993	-0.2895	0.1517	0.3078	-0.4233	-0.3952
	(0.344)	(0.288)	(0.487)	(0.488)	(0.413)	(0.324)	(0.658)	(0.656)
Observations	10,329	8,416	9,088	9,088	8,298	6,739	7,306	7,306
R-squared	0.637	0.175	0.347	0.345	0.661	0.178	0.323	0.323

Panel B. Changes in Ownership in Targets

Dependent Variable :	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Targets with No Increase in Independence				Private Acquirers			
	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0164**	-0.0081	0.0263***	0.0226***	-0.0173***	-0.0158***	0.0241***	0.0212***
	(0.007)	(0.006)	(0.008)	(0.008)	(0.004)	(0.004)	(0.005)	(0.005)
Cash Flow/Total Assets	0.1032***	0.0792***	0.0666**	0.0369*	0.0856***	0.0708***	0.0754***	0.0560***
	(0.018)	(0.022)	(0.034)	(0.021)	(0.010)	(0.015)	(0.021)	(0.015)
AFTER x Cash Flow		-0.0572**	-0.0485			-0.0701***	-0.0387*	
		(0.027)	(0.036)			(0.021)	(0.023)	
Constant	0.2415	-0.1474	-0.4272	-0.3657	0.0765	0.3106*	-0.5355	-0.4948
	(0.419)	(0.290)	(0.492)	(0.490)	(0.231)	(0.188)	(0.372)	(0.371)
Observations	7,407	6,094	6,659	6,659	18,936	15,441	16,672	16,672
R-squared	0.596	0.129	0.327	0.327	0.634	0.156	0.312	0.312

Appendix Table A5. Pooled regressions including both target and matched firms

This table presents estimates of equations from Tables 3, 4, and 5 using a sample of both target firms and their industry-size-country matched firms. Matched firms are firms with the closest total assets at the year prior to the acquisition on *Amadeus* from the same country and two-digit industry code. All matching firms have non-missing financial data for at least one year before and one year after the merger and must have a difference in total assets of less than 20% with the target's total assets, or else the observation is dropped. The dependent variables are cash holdings normalized by total assets in Column (1), gross investment normalized by total assets in Column (2) and (4), and changes in cash holdings in Column (3). For target firms, AFTER is a dummy variable that equals one (zero) for years after (before) an acquisition of target firms to which the firm is matched. For matched firms, AFTER equals zero for all years. The definition and sources of variables are provided in the Data Appendix. Firm and year fixed effects are included. Standard errors are corrected for clustering of observations at the firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)
Dependent Variable:	Cash/Asset	Δ(Cash/Asset)	Inv/Asset	Inv/Asset
AFTER	-0.0155***	-0.0103***	0.0093***	0.0071***
	(0.003)	(0.002)	(0.003)	(0.003)
Cash Flow/Total Assets	0.1010***	0.0882***	0.0665***	0.0551***
	(0.007)	(0.010)	(0.011)	(0.009)
AFTER x Cash Flow		-0.0743***	-0.0308**	
		(0.015)	(0.015)	
Ln(Total Assets)	0.0248	-0.0074	0.0423*	0.0401
	(0.017)	(0.016)	(0.025)	(0.025)
Ln(Total Assets)^2	-0.0009*	0.0004	-0.0001	-0.0000
	(0.000)	(0.000)	(0.001)	(0.001)
Private Credit/GDP	-0.0192***	-0.0056	-0.0094	-0.0095
	(0.007)	(0.005)	(0.007)	(0.007)
Market Cap/GDP	0.0031	-0.0018	-0.0098*	-0.0094*
	(0.004)	(0.004)	(0.005)	(0.005)
GDP Growth	0.0085	0.0005	0.1282***	0.1270***
	(0.011)	(0.017)	(0.030)	(0.030)
Constant	-0.0558	0.0250	-0.6295***	-0.6080***
	(0.139)	(0.138)	(0.210)	(0.210)
Observations	54,381	41,427	48,025	48,025
R-squared	0.673	0.156	0.333	0.333

Appendix Table A6. The effect of Acquisitions on Cash Holdings, Investment, and their Sensitivities – Robustness on the sample

This table presents estimates of equations from Tables 3, 4, and 5 after eliminating target firms where the number of employees changes by more than 10% (or total assets changes by more than 10% if number of employees is missing) in the two years following the acquisition. The dependent variables are cash holdings normalized by total assets in Column (1) and (2), changes in cash holdings in Column (3) and (4), and gross investment normalized by total assets in Column (5), (6), (7), and (8), and. The definition and sources of variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash/Asset		Δ(Cash/Asset)		Inv/Asset		Inv/Asset	
AFTER	-0.0104***	-0.0103*	-0.0137***	-0.0114**	0.0250***	0.0195***	0.0234***	0.0185***
	(0.004)	(0.006)	(0.004)	(0.005)	(0.005)	(0.007)	(0.004)	(0.006)
Cash Flow/Total Assets	0.0933***	0.0714***	0.0721***	0.0908***	0.0698***	0.0552*	0.0565***	0.0478**
	(0.009)	(0.017)	(0.015)	(0.023)	(0.019)	(0.032)	(0.013)	(0.022)
AFTER x Cash Flow			-0.0266	-0.0616*	-0.0253	-0.0133		
			(0.021)	(0.032)	(0.022)	(0.037)		
Ln(Total Assets)	0.0510*	0.0162	0.0058	-0.0232	0.0255	-0.0016	0.0231	-0.0037
	(0.031)	(0.050)	(0.023)	(0.039)	(0.050)	(0.075)	(0.050)	(0.074)
Ln(Total Assets)^2	-0.0018**	-0.0005	0.0000	0.0009	0.0004	0.0016	0.0004	0.0017
	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)
Ln(Number of Employees)		-0.0116**		-0.0031		-0.0133*		-0.0134*
		(0.006)		(0.005)		(0.008)		(0.008)
Sales Growth		0.0009		-0.0027		0.0293***		0.0294***
		(0.004)		(0.005)		(0.006)		(0.006)
Leverage		-0.0847***		-0.0100		0.0369***		0.0370***
		(0.013)		(0.010)		(0.013)		(0.013)
Private Credit/GDP	-0.0117	-0.0116	0.0029	0.0153	-0.0044	-0.0177	-0.0046	-0.0176
	(0.011)	(0.015)	(0.008)	(0.011)	(0.012)	(0.017)	(0.012)	(0.017)
Market Cap/GDP	-0.0043	-0.0010	-0.0059	-0.0144	-0.0107	-0.0017	-0.0102	-0.0016
	(0.006)	(0.009)	(0.007)	(0.010)	(0.009)	(0.013)	(0.009)	(0.013)
GDP Growth	0.0020	0.1923**	-0.0167	0.0827	0.1541***	0.0655	0.1524***	0.0653
	(0.017)	(0.077)	(0.024)	(0.071)	(0.053)	(0.110)	(0.052)	(0.110)
Constant	-0.2411	0.0857	-0.0910	0.1630	-0.4977	-0.3365	-0.4742	-0.3172
	(0.254)	(0.429)	(0.196)	(0.338)	(0.410)	(0.621)	(0.410)	(0.615)
Observations	18,427	7,968	15,021	7,774	16,173	8,085	16,173	8,085
R-squared	0.628	0.674	0.148	0.169	0.297	0.351	0.296	0.351

Appendix Table A7. The effect of Acquisitions on Cash Holdings, Investment, and their Sensitivities – Excluding the observations one year after the acquisition

This table presents estimates of equations from Tables 3, 4, and 5 after eliminating firm-year observations one year after the acquisition. The dependent variables are cash holdings normalized by total assets in Column (1) and (2), changes in cash holdings in Column (3) and (4), and gross investment normalized by total assets in Column (5), (6), (7), and (8). The definition and sources of variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash/Asset		Δ(Cash/Asset)		Inv/Asset		Inv/Asset	
AFTER	-0.0152***	-0.0105	-0.0031	0.0019	0.0276***	0.0302***	0.0241***	0.0253***
	(0.005)	(0.007)	(0.004)	(0.006)	(0.006)	(0.008)	(0.005)	(0.008)
Cash Flow/Total Assets	0.0948***	0.0676***	0.0626***	0.1119***	0.0987***	0.0977***	0.0755***	0.0658***
	(0.010)	(0.018)	(0.016)	(0.032)	(0.021)	(0.035)	(0.014)	(0.024)
AFTER x Cash Flow			-0.0434**	-0.0913**	-0.0457*	-0.0627		
			(0.021)	(0.038)	(0.024)	(0.043)		
Ln(Total Assets)	0.0129	0.0827*	-0.0127	-0.0058	-0.0157	-0.0520	-0.0207	-0.0611
	(0.024)	(0.046)	(0.021)	(0.037)	(0.043)	(0.067)	(0.043)	(0.066)
Ln(Total Assets)^2	-0.0007	-0.0025*	0.0004	0.0002	0.0015	0.0029	0.0016	0.0032
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Ln(Number of Employees)		-0.0141**		-0.0053		-0.0152**		-0.0159**
		(0.006)		(0.005)		(0.008)		(0.008)
Sales Growth		0.0040		-0.0031		0.0327***		0.0326***
		(0.004)		(0.006)		(0.007)		(0.007)
Leverage		-0.0904***		-0.0063		0.0220		0.0234
		(0.014)		(0.011)		(0.015)		(0.015)
Private Credit/GDP	-0.0226**	-0.0208	-0.0046	0.0000	-0.0082	-0.0120	-0.0083	-0.0107
	(0.011)	(0.015)	(0.008)	(0.010)	(0.012)	(0.018)	(0.012)	(0.018)
Market Cap/GDP	0.0046	-0.0028	-0.0001	-0.0099	-0.0149	-0.0058	-0.0138	-0.0052
	(0.006)	(0.011)	(0.006)	(0.010)	(0.009)	(0.014)	(0.009)	(0.014)
GDP Growth	-0.0036	0.1071	-0.0131	0.0799	0.1575***	0.1945	0.1550***	0.1878
	(0.020)	(0.084)	(0.027)	(0.081)	(0.047)	(0.147)	(0.046)	(0.147)
Constant	0.0677	-0.4391	0.1077	0.0654	-0.1130	0.1419	-0.0638	0.2268
	(0.205)	(0.392)	(0.182)	(0.320)	(0.358)	(0.556)	(0.357)	(0.549)
Observations	19,464	8,083	15,776	7,875	17,192	8,266	17,192	8,266
R-squared	0.624	0.675	0.175	0.212	0.338	0.386	0.337	0.385

Appendix Table A8. The effect of Acquisitions on Cash Holdings, Investment, and their Sensitivities – Robustness on Scaling by Total Assets

This table presents estimates of equations from Tables 3, 4, and 5 scaling *all* variables by assets in the year prior to the acquisition, rather than the value of assets contemporaneously. The dependent variables are cash holdings normalized by total assets in Column (1) and (2), changes in cash holdings in Column (3) and (4), and gross investment normalized by total assets in Column (5), (6), (7), and (8). The definition and sources of variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Dependent Variable	Cash/Asset		Δ(Cash/Asset)		Inv/Asset		Inv/Asset	
AFTER	-0.0084**	-0.0134**	0.0013	0.0031	0.0334***	0.0269***	0.0293***	0.0208***
	(0.004)	(0.006)	(0.004)	(0.006)	(0.005)	(0.008)	(0.005)	(0.007)
Cash Flow/Total Assets	0.1085***	0.1039***	0.0898***	0.1407***	0.0561***	0.0923***	0.0324***	0.0611***
	(0.010)	(0.022)	(0.015)	(0.027)	(0.016)	(0.028)	(0.012)	(0.021)
AFTER x Cash Flow			-0.0420**	-0.0915***	-0.0428**	-0.0607*		
			(0.019)	(0.034)	(0.020)	(0.033)		
Ln(Total Assets)	0.2577***	0.3084***	0.0925***	0.0824*	-0.0212	-0.0545	-0.0227	-0.0606
	(0.028)	(0.055)	(0.024)	(0.044)	(0.039)	(0.059)	(0.039)	(0.059)
Ln(Total Assets)^2	-0.0059***	-0.0064***	-0.0022***	-0.0019	0.0031***	0.0043**	0.0031***	0.0045**
	(0.001)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Ln(Number of Employees)		-0.0159***		-0.0139***		-0.0139**		-0.0146**
		(0.005)		(0.005)		(0.006)		(0.006)
Sales Growth		-0.0015		0.0126**		0.0116**		0.0118**
		(0.004)		(0.005)		(0.005)		(0.005)
Leverage		-0.0617***		0.0098		0.0212		0.0213
		(0.013)		(0.011)		(0.014)		(0.014)
Private Credit/GDP	-0.0031	-0.0324**	-0.0163*	-0.0094	-0.0031	-0.0186	-0.0035	-0.0182
	(0.011)	(0.015)	(0.009)	(0.013)	(0.012)	(0.016)	(0.012)	(0.016)
Market Cap/GDP	-0.0129**	-0.0072	-0.0141**	-0.0137	0.0050	0.0107	0.0060	0.0111
	(0.006)	(0.011)	(0.007)	(0.010)	(0.007)	(0.011)	(0.007)	(0.011)
GDP Growth	0.0420**	0.1692*	-0.0106	0.0589	0.0807	-0.0604	0.0800	-0.0617
	(0.019)	(0.097)	(0.028)	(0.099)	(0.052)	(0.120)	(0.052)	(0.121)
Constant	-2.5035***	-3.0679***	-0.8902***	-0.7703**	-0.4807	-0.2069	-0.4578	-0.1405
	(0.236)	(0.475)	(0.205)	(0.369)	(0.317)	(0.481)	(0.318)	(0.480)
Observations	27,878	9,948	19,733	8,465	20,814	8,688	20,814	8,688
R-squared	0.609	0.679	0.197	0.263	0.395	0.423	0.394	0.423

Appendix Table A9. The effect of Acquisitions on Cash Holdings, Investment, and their Sensitivities – Robustness on "AFTER" dummy

This table presents estimates of equations with different definitions of the AFTER dummy, the dependent variable. We restrict the sample only to three years (Panel A) or five years (Panel B) immediately before and after the acquisition. The dependent variables are cash-to-assets ratio in Column (1) and (2), changes in cash holdings in Column (3) and (4), and gross investment-to-assets ratio in Column (5), (6), (7), and (8), and. The definition and sources of variables are provided in the Data Appendix. Target-firm and year fixed effects are included in all regressions. Standard errors are corrected for clustering of observations at the target-firm level and associated standard errors are in parentheses. The symbols ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels.

Panel A. Three years before and after the acquisition

Dependent Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Cash/Asset		Δ(Cash/Asset)		Inv/Asset		Inv/Asset	
AFTER	-0.0187***	-0.0213***	-0.0271***	-0.0231***	0.0247***	0.0314***	0.0194***	0.0255***
	(0.004)	(0.006)	(0.005)	(0.007)	(0.005)	(0.008)	(0.005)	(0.007)
Cash Flow/Total Assets	0.0859***	0.0556***	0.0774***	0.1027***	0.0814***	0.0711**	0.0433***	0.0303
	(0.010)	(0.020)	(0.017)	(0.032)	(0.020)	(0.030)	(0.014)	(0.022)
AFTER x Cash Flow			-0.0591***	-0.1025***	-0.0680***	-0.0729**		
			(0.021)	(0.036)	(0.021)	(0.034)		
Ln(Total Assets)	0.0394	0.0379	-0.0255	-0.0325	0.0029	-0.0491	-0.0070	-0.0652
	(0.040)	(0.058)	(0.032)	(0.053)	(0.057)	(0.093)	(0.057)	(0.092)
Ln(Total Assets)^2	-0.0014	-0.0010	0.0009	0.0011	0.0015	0.0037	0.0018	0.0041
	(0.001)	(0.002)	(0.001)	(0.002)	(0.002)	(0.003)	(0.002)	(0.003)
Ln(Number of Employees)		-0.0181***		-0.0029		-0.0159*		-0.0174*
		(0.006)		(0.006)		(0.009)		(0.009)
Sales Growth		-0.0022		-0.0022		0.0234***		0.0233***
		(0.004)		(0.005)		(0.006)		(0.006)
Leverage		-0.0829***		-0.0030		0.0113		0.0130
		(0.014)		(0.012)		(0.017)		(0.017)
Private Credit/GDP	-0.0209	-0.0188	-0.0102	-0.0044	-0.0117	-0.0154	-0.0120	-0.0138
	(0.014)	(0.018)	(0.011)	(0.015)	(0.015)	(0.022)	(0.015)	(0.022)
Market Cap/GDP	0.0023	-0.0101	-0.0180*	-0.0254*	0.0022	-0.0117	0.0041	-0.0107
	(0.009)	(0.014)	(0.010)	(0.015)	(0.012)	(0.019)	(0.012)	(0.019)
GDP Growth	-0.0131	0.1969*	-0.0026	0.0290	0.0589	-0.1363	0.0503	-0.1435
	(0.029)	(0.108)	(0.031)	(0.113)	(0.057)	(0.183)	(0.057)	(0.182)
Constant	-0.1274	-0.0848	0.2245	0.3145	-0.4322	-0.1081	-0.3356	0.0407
	(0.328)	(0.495)	(0.272)	(0.453)	(0.468)	(0.761)	(0.466)	(0.749)
Observations	18,883	8,135	16,381	7,957	17,629	8,256	17,629	8,256
R-squared	0.662	0.702	0.238	0.281	0.392	0.457	0.391	0.457

Panel B. Five years before and after the acquisition

Dependent Variable	(1) Cash/Asset	(2) Cash/Asset	(3) Δ(Cash/Asset)	(4) Δ(Cash/Asset)	(5) Inv/Asset	(6) Inv/Asset	(7) Inv/Asset	(8) Inv/Asset
AFTER	-0.0159***	-0.0154***	-0.0153***	-0.0113**	0.0275***	0.0307***	0.0231***	0.0251***
	(0.003)	(0.005)	(0.004)	(0.005)	(0.004)	(0.006)	(0.004)	(0.006)
Cash Flow/Total Assets	0.0869***	0.0616***	0.0767***	0.1038***	0.0904***	0.0792***	0.0607***	0.0427**
	(0.009)	(0.016)	(0.014)	(0.027)	(0.017)	(0.028)	(0.012)	(0.019)
AFTER x Cash Flow			-0.0677***	-0.1002***	-0.0551***	-0.0683**		
			(0.018)	(0.030)	(0.019)	(0.033)		
Ln(Total Assets)	0.0216	0.0393	-0.0302	-0.0397	0.0131	-0.0303	0.0059	-0.0415
	(0.026)	(0.042)	(0.021)	(0.035)	(0.041)	(0.062)	(0.041)	(0.061)
Ln(Total Assets)^2	-0.0009	-0.0011	0.0011*	0.0013	0.0009	0.0027	0.0010	0.0030
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.002)
Ln(Number of Employees)		-0.0156***		-0.0012		-0.0186***		-0.0197***
		(0.005)		(0.004)		(0.007)		(0.007)
Sales Growth		0.0004		-0.0024		0.0302***		0.0300***
		(0.003)		(0.004)		(0.005)		(0.005)
Leverage		-0.0869***		-0.0037		0.0164		0.0174
		(0.012)		(0.010)		(0.013)		(0.013)
Private Credit/GDP	-0.0163	-0.0197	-0.0079	-0.0036	-0.0119	-0.0141	-0.0123	-0.0132
	(0.010)	(0.013)	(0.007)	(0.009)	(0.011)	(0.015)	(0.011)	(0.015)
Market Cap/GDP	0.0034	-0.0013	-0.0086	-0.0132	-0.0129	-0.0107	-0.0116	-0.0096
	(0.007)	(0.010)	(0.007)	(0.010)	(0.009)	(0.014)	(0.009)	(0.014)
GDP Growth	-0.0048	0.1492*	-0.0223	0.0530	0.1299***	0.1710	0.1252***	0.1661
	(0.022)	(0.083)	(0.025)	(0.076)	(0.045)	(0.153)	(0.045)	(0.154)
Constant	-0.0177	-0.1017	0.2426	0.3344	-0.4085	-0.1264	-0.3384	-0.0221
	(0.218)	(0.356)	(0.185)	(0.304)	(0.340)	(0.507)	(0.340)	(0.502)
Observations	25,504	10,923	21,674	10,647	23,416	11,106	23,416	11,106
R-squared	0.639	0.679	0.175	0.209	0.333	0.389	0.333	0.388

Data Appendix

This table contains descriptions and the sources of variables used in our analyses. Country-level and firm-level variables are measured at the annual frequency. Deal-level items are measured as of the last fiscal year-end before the deal is completed.

Variable	Description
	Panel A. Country-level variables
Private Credit/GDP	Private credit by deposit money banks and other financial institutions to GDP (Source: Beck and Demirgüç-Kunt (2009), updated as of April 2010. The raw data used in this paper are from *IMF's International Financial Statistics*)
Market Cap/GDP	Value of listed shares to GDP (Source: Beck and Demirgüç-Kunt (2009), updated as of April 2010. The raw data used in this paper are from *IMF's International Financial Statistics*)
GDP Growth	Annual percentage nominal growth rate of GDP in local currencies (Source: *World Bank*)
Diff_Corptax	The difference in corporate income tax rates between target's and acquirer's countries (Source: *OECD*)
	Panel B. Deal-level variables (Source: *Zephyr*)
Domestic/Cross-border Deals	A deal is domestic (cross-border) if the target and acquiring firms are from the same nation (different nations).
Independent/Subsidiary Target	A given target firm is coded as an independent one if it is not a subsidiary of another firm.
Public/Private Target (Acquirer)	Target (acquirer) is a public firm if is listed or delisted.
Financial Target	Target is a financial firm if its primary industry classification (NAICS) is 52 or 53 (or first digit of US SIC code is 6 if NAICS code is missing).
Same_Industry	Target is in a same industry as the acquiring firm if their first 2 digits of the primary US SIC code are the same.
	Panel C. Firm-level variables (Source: *Amadeus*)
Total Assets	Book value of assets = Fixed assets (FIAS) + Current assets (CUAS)
Ln(Total Assets)	Natural logarithm of total assets converted into US dollars.
Number of Employees	The number of employees (EMPL)
Cash/Total Assets	Cash and cash equivalents (CASH) / Total Assets
Gross Investment/Total Assets	[Fixed assets - lagged Fixed assets + Depreciation (DEPRE)]/ Total Assets
Cash Flows/Total Assets	Cash flows (CF) / Total assets
Δ(Cash/Total Assets)	Cash flows/Total Assets - lagged (Cash flows/Total Assets)
ROA	EBITDA(EBTA) / Total Assets
Sales Growth	(Sales (TURN) - Lagged Sales)/Lagged Sales
Leverage	[Long term debt (LTDB) + Current liabilities (CULI)] / Total Assets