Unrelated Acquisitions

Rajesh K. Aggarwal
Carlson School of Management
University of Minnesota
321 19th Avenue South
Room 3-122
Minneapolis, MN 55455
612-625-5679
rajesh@umn.edu

Mufaddal Baxamusa
Opus College of Business
University of St. Thomas
MCH 336, 2115 Summit Avenue
St Paul, MN 55105
651-962-5845
baxa0428@stthomas.edu

Abstract: A large fraction of acquisitions occur between unrelated firms—acquisitions that are neither horizontal nor vertical. Unrelated acquisitions are positively correlated with multiple measures of information asymmetry. Unrelated acquirers have a higher cost of capital and use more stock in their acquisitions. Nonetheless, unrelated acquisitions have positive cumulative abnormal announcement returns and outperform related acquisitions, suggesting that these are value-creating mergers. Post-merger, target firm segments' cash flows are used to finance acquirer firm segments' investments, consistent with unrelated acquisitions occurring to create an internal capital market where target firm cash flows cross-subsidize acquiring firm investments.

Keywords: Mergers, Acquisitions, Internal Capital Markets, Segments.

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1. Introduction

Unrelated mergers occur between firms that are neither product market competitors nor linked in a buyer-supplier relationship. While there are many potential sources of value creation in related mergers (mergers that can be classified as either horizontal or vertical),[1] the sources of value creation are less clear when it comes to unrelated mergers. Intriguingly, we find that the largest group of acquisitions occurs between unrelated firms. In the recent literature, these unrelated mergers have not been the focus of most research.[2] This paper examines why unrelated mergers occur and whether they create value.

We find that unrelated mergers generate more value than related mergers—cumulative abnormal announcement returns are higher, and operating performance post-merger is better for unrelated mergers. This is in contrast to the evidence for diversifying mergers from the 1980s (Shleifer and Vishny (1991)), who find that diversifying mergers earn lower announcement returns than related mergers. Given the clear economic rationales that exist for related mergers, whether horizontal or vertical, our results are surprising. We also find that investment is greater post-merger for unrelated mergers. This investment is higher for the acquirer's original operating segments but is lower for the target's original operating segments. This result suggests that unrelated acquirers may be using target firm cash flows to subsidize acquiring firm capital investments. We test this proposition and find support for it.[3]

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[1] Examples include the elimination of double marginalization and transactions costs in vertical mergers, and the generation and exploitation of market power in horizontal mergers (see Alchian, Crawford and Klein (1978), Grossman and Hart (1986), Borenstein (1990), Kim and Singal (1993), Prager and Hannan (1998), Eckbo (1983), Shahrur (2005), Lafontaine and Slade (2007), and Bhattacharya and Nain (2011)).

[2] While there is a literature that has looked at conglomerate merger waves (see e.g., Shleifer and Vishny (1991) for a discussion of the 1960's and 1980's), our analysis suggests that diversifying mergers are much more common in recent times than previously thought.

[3] Two recent papers provide a different perspective on investment cross-subsidization. Erel, Jang, and Weisbach (2012) argue that acquirers provide financing for target investments, and find support for this in European acquisitions. As the samples are very different, we view their results as complementary to ours. Almeida, Campello, and Hackbarth (2011) argue that liquid acquirers, those with access to credit lines, are more likely to

While the possibility that unrelated acquiring firms may be using the acquisitions to cross-subsidize investment in their original divisions is interesting, we do not claim that this cross-subsidization is necessarily inefficient. Indeed, our results on post-merger operating performance suggest that unrelated acquisitions may be quite efficient. Moreover, if the motivation for unrelated mergers is a desire to engage in cross-subsidization, this suggests that the acquiring firms are unable to fund investment in their own divisions yet are able to fund an acquisition (or that funding for an acquisition is cheaper than funding for internal investment). Consistent with this, we also provide evidence showing that unrelated acquirers have higher costs of capital and use more stock to finance their acquisitions than do related acquirers. This evidence suggests that unrelated acquirers do indeed have less access to external capital.

If unrelated acquirers do have less access to financing, and yet ex post seem to have valuable investment opportunities, we wonder why this might be. In another set of tests, we examine whether unrelated acquirers suffer from a higher degree of information asymmetry. We use several measures of information asymmetry, and find that unrelated acquirers have substantially higher levels of information asymmetry along every measure. One interpretation of these results is that unrelated acquisitions happen so that good type acquirers can fund their valuable internal investment opportunities with the target firm's cash flows. Acquisitions appear to be easier to finance than internal investment for good types.[4]

As unrelated acquisitions can be thought of as diversifying acquisitions, it is worth considering whether there are benefits of diversification. There is a large literature that considers the costs of diversification (see, e.g., Rajan, Servaes, and Zingales (2000)). One argument is that diversification leads

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acquire financially distressed targets even in the absence of synergies. We acknowledge that investment cross-subsidization may happen from both targets to acquirers and acquirers to targets.

[4] Our results are related to those in Gormley and Matsa (2011). They find that firms facing product liability risk engage in unrelated acquisitions, and, in contrast to our results, that these acquisitions have negative announcement returns. Our sample is broader, and we emphasize an investment motive for these acquisitions rather than a desire by managers to reduce their personal exposures to firm risk.

to internal capital markets and the inefficient allocation of capital to the various divisions (see Lamont (1997)). Shin and Stulz (1998) find that the segment's sensitivity of investment to cashflows of other segments in a firm is not dependent on whether its investment opportunities are better than that of other segments. Scharfstein and Stein (2000) show that one reason for internal capital markets may be rent-seeking behavior by divisional managers.

On the other hand, there is also a literature that suggests there may not be a diversification discount (see Campa and Kedia (2002), Graham, Lemmon, and Wolf (2002), Villalonga (2004), and Hund, Monk and Tice (2010)). Our analysis more precisely identifies mechanisms and reasons for unrelated acquisitions. Diversifying acquirers may create internal capital markets to fund future investment of the acquirer's original segments, and these internal capital markets are beneficial.

In the next section, we develop several hypotheses that we then test. Section 3 describes our data and the various measures we construct for our tests. Sections 4 through 7 present our main results. Section 8 concludes.

2. Hypothesis Development

To understand the potential reasons for unrelated acquisitions, we examined a number of these mergers in detail. It appears that many of the targets are already mature industry leaders, suggesting that these targets are potential cash-cows. A good example of this is the April 2001 acquisition by Active IQ Technologies (an e-business service provider) of Meteor Industries (a distributor of petroleum products). Kenneth Brimmer, the CEO of Active IQ, commented at the time, "We are pleased to have completed this important financing transaction. Active IQ is now positioned with approximately $5 million in cash to

execute its business plan."[5] What is interesting here is that the acquisition seems to have been a source for future financing, and not just a use of current financing. This suggests the following story.

In arms-length financing, the investors are typically less informed than the managers about the value of a project. This in turn leads to managers overstating the benefits of the project resulting in adverse selection. The consequence of adverse selection is that some positive NPV projects may not be funded (or the firm may need to send costly signals every time the firm needs to raise external capital). To reduce the consequences of adverse selection, the firm may want to generate an internal capital market.

One way to generate an internal capital market is to acquire a firm whose cash flows are less correlated with those of the firm. In order to finance the acquisition, the firm may need to use the external capital market. In relation to an individual project, an acquisition has less informational problems because the acquisitions are covered by analysts and the media. Additionally, independent opinions are regularly sought about acquisitions and this information is publicly distributed. A crucial assumption is that the acquirers who are able to execute an unrelated transaction are good type acquirers but that their type is unobservable.

More precisely, consider two types of firms, good and bad. Each type has an investment project. Both types would like to take their investment projects, but only the good type's project has positive NPV. Since type is unobservable, neither type can get financing for their investment project. Both types can also choose to engage in an unrelated acquisition. Unrelated targets generate future cash flows which are sufficient to fund the investment project. An acquisition attempt generates a signal about the acquirer's type in the form of analyst reports, media attention, and investor scrutiny. For

[5] Source: http://www.theautochannel.com/news/2001/05/01/019893.html

a sufficiently informative signal, only good types will choose to engage in an unrelated acquisition. Bad types will not pool with good types and therefore will not complete unrelated acquisition. While engaging in an unrelated acquisition may lead to positive announcement returns for bad acquirers, long-term operating performance will be negative since these are bad types, resulting in worse outcomes than no acquisition. More precisely, a poor acquisition will reveal a bad type more quickly than would no acquisition. Note that we are assuming that acquisitions are a much more transparent and informative form of investment than are internal investment projects.

We have assumed that the acquisition is an unrelated one for two reasons. First, if a firm in an industry is financing-constrained relative to undertaking an investment project, then it is likely that other firms in that industry are also financing-constrained. In this case, engaging in a related acquisition (an acquisition in the same industry) will not resolve the financing problem for the investment (Shleifer and Vishny (1992)). Second, firms engage in related acquisitions for a variety of economic reasons that are independent of information asymmetry, and our argument relies strictly on information asymmetry. To the extent that a related transaction has no other economic rationale other than information asymmetry, then it would fit within our story as well. However, such transactions are likely to be rare. Note that this also implies that in addition to good and bad types with investment projects, there are also other firms that independently choose to engage in related transactions. Given this structure, the natural specification for our empirical tests is to compare firms that engage in unrelated transactions with firms that engage in no transactions, recognizing that the decision to engage in an unrelated transaction is a choice made to separate from the non-acquirers. This then is a selection model. In order to implement a selection model, we must find exogenous variation that is correlated with the firm's choice to engage in an unrelated transaction.

For completeness, we also consider a second specification in which we compare unrelated acquirers to related acquirers. Here, we consider the possibility that a firm first decides to make an acquisition and then chooses whether to make an unrelated versus a related acquisition. In this case, there is still a choice being made, and so we again implement selection models for this comparison.

The information asymmetry argument leads to several hypotheses.

Hypothesis 1: Unrelated acquirers have higher levels of information asymmetry (are more informationally opaque) than do non-acquirers or related acquirers.

Above we argue that unrelated acquirers are good types while non-acquirers are bad types. However, there are a number of firms that engage in no acquisitions simply because they have no interest in doing so, and not because they are constrained due to being bad types. In other words, the sub-population of non-acquirers contains both bad types and neutral types. Thus, we expect that unrelated acquirers will face higher levels of information asymmetry than do non-acquirers. For related acquirers, recall that these firms independently choose to engage in related transactions, so these firms can also be viewed as neutral types.

Hypothesis 2: Unrelated acquisitions are "good" acquisitions that result in higher announcement returns for the acquirer than do related acquisitions.

Because an unrelated acquisition generates a signal about an unrelated acquirer that reveals the acquirer's type, unrelated acquisitions have higher announcement returns than do related acquisitions in which there is no information revelation. As there is no announcement for non-acquisitions, there is no testable return implication for non-acquirers.

Hypothesis 3: Unrelated acquirers make operational improvements and increase the performance of the merged company relative to non-acquirers and related acquirers.

Unrelated acquirers are good types, and as a result are able to run the merged firm more efficiently. The bad types are non-acquirers (along with hypothetical targets), who form a baseline against which to measure the performance of the unrelated acquirers. Related acquirers are neutral types, and they form an alternative baseline for the unrelated acquirers.

Hypothesis 4: Post-acquisition, unrelated acquirers increase investment in the acquirer's original divisions and decrease investment in the target's original divisions relative to non-acquirers and related acquirers.

Recall that unrelated acquirers are constrained from taking internal investment projects as a result of information asymmetry. After the acquisition, unrelated acquirers are able to take these investment projects, possibly at the expense of investment projects in the target's original divisions.

Hypothesis 5: Post-acquisition, unrelated acquirers cross-subsidize the acquirer's original divisions from the target divisions' cash flows while no such cross-subsidy is available to the target division.

Put differently, the acquirer segment investment/target segment cash flow sensitivity is greater for unrelated acquirers, while the target segment investment/acquirer segment cash flow sensitivity is weaker for unrelated acquirers. Unrelated acquirers are able to take investment projects after the acquisition by appropriating cash flows from the target. In other words, rather than purchasing growing firms, unrelated acquirers purchase mature firms and use the cash flows to cross-subsidize the acquirers' original segments' investment and growth.

Hypothesis 6: Unrelated acquirers face relatively higher external costs of capital due to information asymmetry, and therefore finance more of their acquisitions with stock than do related acquirers.

If information asymmetry constrains the ability of unrelated acquirers to finance investment, then these acquirers are also less likely to be able to use cash or debt financing for their acquisitions. As a result, we expect unrelated acquirers to use relatively more equity than related acquirers to finance their acquisitions.

We test these implications on a large sample of acquisitions from 1997 to 2007, as we describe in the next section. An important point to keep in mind is that our argument differs from the prior literature that finds diversifying (unrelated) acquisitions are value destroying in earlier time periods, such as the 1960s and 1980s (Shleifer and Vishny (1991)). In contrast, for our sample period, we hypothesize that unrelated acquisitions may be value-enhancing, although possibly at the expense of some target firm investments.

3. Data

We use data from a variety of sources. Our outcome variables—either returns or accounting performance—come from CRSP and Compustat. The individual segments accounting data comes from the segments files of Compustat. Only those firms that have sales, profit or assets greater than 10% of the corresponding consolidated totals are required to report segments data. Hence, firms not reporting data in the segments file of Compustat are assumed to have one segment.

The domestic merger and acquisitions data are from SDC. We use standard filters on the data from SDC. The announcement dates for these acquisitions are between 1997 and 2007 to correspond to the Hoberg and Phillips (2010) classifications for horizontal mergers. Acquirers and targets must be

publicly traded—for many of our tests, we will require financial and operating data for the acquirer and target pre-acquisition, and these data are only consistently available for publicly-traded firms. Acquirers must own less than 50% of the target before announcement, and obtain 100% of the target's shares. The deal value must be greater than $1 million and be greater than five percent of the total assets of the acquirer. The deal must be completed within 1000 days of announcement. Also, we exclude acquirers from the financial services and utility sectors.

A. Unrelated versus Related Acquisitions

Our primary independent variable is whether an acquisition is a related or an unrelated acquisition. To construct the dummy variable *Unrelated*, we first need to define what a related acquisition is. A related acquisition is either a vertical merger or a horizontal merger, and the set of unrelated acquisitions is then the complement of the related acquisitions.

We define a vertical merger using the methodology of Fan and Lang (2000) and Fan and Goyal (2006) and employ the Benchmark Use Table from the National Bureau of Economic Analysis.[6] These benchmark tables are published every five years and the industry classifications are regularly modified. We hand construct a concordance by going through each industry classification and then mapping previous industry classifications to the current industry classifications. The Use Table is a matrix containing the value of commodity flows between each pair of roughly 491 private-sector, intermediate six-digit IO industries (see Lawson et. al., (2002) for detailed description of the dataset). The table reports for each pair of industries, i and j, the dollar value of i's output required to produce industry j's total output (a_{ij}).

[6] The data are available from: http://www.bea.gov/industry/io_benchmark.htm

The value a_{ij} is divided by the dollar value of industry j's total output to get v_{ij}, representing the dollar value of industry i's output required to produce one dollar's worth of industry j's output. Conversely, a_{ji} is divided by the dollar value of industry i's total output to get v_{ji}, representing the dollar value of industry j 's output required to produce a dollar's worth of industry i's output. The maximum of v_{ij} and v_{ji} represents the vertical relationship, and if it exceeds one percent, then we classify the merger as a vertical merger.

For horizontal mergers, Hoberg and Phillips (2010) convincingly argue that SIC based classifications of similarity or relatedness are too coarse to adequately capture the extent of true relatedness. They propose a text-based network industry classification (TNIC) method to classify firms as being similar in a product market sense. Using their methodology, we classify mergers as being horizontally related. Their data start in 1997. A related acquisition is then any acquisition that is either horizontal or vertical, as defined above. An unrelated acquisition is any acquisition that is neither horizontal nor vertical. These mergers have been underexplored in the literature relative to horizontal and vertical mergers.

Table 1 provides summary data for our sample. We find that the largest fraction (42.6%) of the mergers is unrelated. In fact, if we use a more stringent definition for vertical mergers, that the maximum of v_{ij} and v_{ji} exceeds five percent, then the majority of the mergers can be classified as unrelated. However, we take a more conservative approach by defining vertical as the maximum of v_{ij} and v_{ji} exceeding one percent. In Table 1, the supplier correlation and customer correlation between the acquirer and the target is lower for unrelated mergers than it is for horizontal and vertical mergers. For horizontal mergers, the correlations are all one, as these measures are defined at the industry level. The vertical

mergers all show correlations between the horizontal mergers and the unrelated mergers, as we would expect.

B. Firm Characteristics

Table 2, Panel A, presents summary statistics on a number of firm characteristics. Firm year observations are separated into three categories—firms that engage in no acquisitions, firms that engage in related transactions, and firms that engage in unrelated transactions. We create matching samples for firms engaging in no acquisitions relative to firms engaging in unrelated acquisitions, and for firms engaging in related acquisitions relative to firms engaging in unrelated acquisitions. We propensity score match samples based on size, industry, and year.

Summary statistics for all firms engaging in unrelated transactions are reported in Column (1), matched firms engaging in no acquisitions in Column (2), and matched firms engaging in related acquisitions in Column (3). Since we are matching the firms in Columns (2) and (3) to the unrelated acquirers in Column (1), we have 1007 observations in each of Columns (1) through (3). We require that acquirers report the relevant accounting information in order to form the data reported in the summary statistics from the fiscal year immediately prior to the announcement of the acquisition to the fiscal year immediately after completion of the acquisition. We also require that target firms report the relevant accounting information in order to form the data reported in the summary statistics in Table 2, Panel B, for the fiscal year immediately prior to the acquisition.

Our first matched or control sample is non-acquirers. This control sample is selected by propensity score matching the size, industry, and year characteristics of the non-acquirers to the unrelated acquirers conditioning on the non-acquirer engaging in no acquisitions during the period from one year

prior to the unrelated acquirer's acquisition to one year after completion of the acquisition. To construct a sample of "target" firms for these non-acquirers, we then match the target characteristics of the unrelated acquisitions to those of other firms in Compustat who have not been previously selected as matching non-acquirers. The characteristics of these hypothetical targets in the fiscal year prior to the announcement of the matched unrelated acquisition are what are reported in Table 2, Panel B, Column (2). To create a hypothetical matched combined firm post-merger for the no acquisition case, we simply add up and scale the variables appropriately for the matched non-acquirer and its hypothetical target at the time that is one fiscal year after completion of the matched unrelated acquisition. These characteristics are what are reported in Table 2, Panel C, Column (2).

Our second matched sample is related acquirers. Out of the 1,358 related acquisitions in our sample of acquisitions with public acquirers and public targets, we propensity score match 1,007 of these acquirers to the 1,007 unrelated acquirers, thus using most of the sample of related acquisitions. Target data for the 1,007 matched related acquisitions are reported in Table 2, Panel B, Column (3). Post-acquisition summary statistics for the related acquisitions are reported in Table 2, Panel C, Column (3).

Table 2, Panel B examines pre-acquisition target characteristics. Targets for unrelated acquirers have higher investment, higher Tobin's Q, higher cash flow, and lower leverage than targets for related acquirers or non-target companies. Table 2, Panel C shows that post-merger acquirer firm characteristics change dramatically across the three matched samples. Unrelated acquirers invest more, have higher Tobin's Q, less debt, and more cash than do related acquirers or non-acquirers.

C. Information Asymmetry

Another key variable in our analysis is the extent of information asymmetry between the firm and the external capital markets, primarily in relation to the firm's internal investment projects, or the extent to which the firm is opaque to external investors. Because information asymmetry is inherently difficult to measure, we use a number of variables identified in the previous literature.

Intangible Assets: Intangible assets are generally hard for investors to value because of informational costs. We use intangible assets less goodwill normalized by total assets as a proxy for asymmetric information.

Discretionary Accruals: Discretionary accruals measure the quality of earnings disclosure (DeAngelo, 1986; Jones, 1991). The higher the discretionary accruals, the poorer is the quality of disclosure and the more opaque is the firm. We use the modified Jones method, which employs the cross sectional characteristics of the data, to measure discretionary accruals.

Analyst Dispersion: We use the dispersion in the one year ahead analysts' EPS forecast as another measure of information asymmetry. This dispersion is standardized by the average forecast. The larger the dispersion, the less consensus, and therefore the larger is the information asymmetry.

Bid-Ask Spread: Bid-ask spreads are higher when adverse selection costs are higher. This increase in spread is independent of the other components of the bid-ask spread, such as inventory holding costs or order processing costs (see Copeland and Galai (1983), Glosten and Milgrom (1985), and Welker (1995)). We use the median of monthly bid-ask spreads divided by price as another measure of information asymmetry.

Herfindahl: Harris (1998) empirically shows that higher industry concentration is correlated with lower levels of disclosure by the firms. Industry concentration is measured by the Herfindahl Index.

Rating: In order for a firm to obtain a debt rating, it needs to disclose additional information, thus reducing information asymmetry. Additionally, rating agencies continuously monitor the firm's health and the rating provides additional information to the public. We capture information asymmetry through ratings by using a dummy variable that takes the value of one if the firm is rated in the year prior to the acquisition and zero otherwise.

Implied Cost of Capital: Implied cost of capital is the internal rate of return that makes the price of the stock equal to its future expected cashflows (Chava and Purnanandam (2010)). Firms with greater information asymmetry have higher costs of capital. Firms with less access to financing and greater risk will also have higher costs of capital (possibly due to information asymmetry), so we primarily use the implied cost of capital as a measure of access to financing and firm risk.

Table 2, Panel D, shows that our matched samples of firms engaging in no acquisitions, related acquisitions, and unrelated acquisitions have similar levels of information asymmetry prior to the acquisitions. However, we also find that the implied cost of capital is significantly higher for unrelated acquirers than for related acquirers and for unrelated acquirers than for matched non-acquirers, implying that unrelated acquirers are riskier than related acquirers and non-acquirers.

D. Exogenous Variation

Our hypothesis is that unrelated acquirers face higher levels of information asymmetry. This suggests that a selection model is the appropriate method for testing the impact of unrelated acquisitions on performance, investment, and financing. Therefore, we implement selection models and seek exogenous variation related to the choice of whether to engage in an unrelated transaction.

For plausible exogenous variation related to industry structure, we use the BEA's Benchmark Input-Output Use Table to construct a measure of the relative importance or centrality of an industry. The idea here is that industries vary in the number of linkages they have to other industries. Some industries are suppliers or buyers from many industries, while some supply or buy from only a few industries. The most commonly used centrality measure is *Degree*.[7] *Degree* counts the number of ties the industry has with other industries. The dataset is rich in the sense that we have additional information about the strength of these ties given by a_{ij}. This suggests that we should use the weighted degree measure where the weight is a_{ij} (see Newman (2004) and Barrat, et. al., (2005)). The results presented here use weighed degree centrality. However, they are robust to using other measures of centrality. We use the measure *Degree* (measured at the industry level) as a source of exogenous variation for the unrelatedness of acquisitions. Table 2, Panel D, also provides summary statistics for *Degree*. As expected, firms engaging in unrelated acquisitions show lower levels of *Degree* (centrality) than do firms engaging in related acquisitions or firms not engaging in acquisitions.

In Table 3, we examine the relation between *Degree* and our information asymmetry variables. We hypothesize that information asymmetry is lower for firms that are more central. We pool the unrelated acquirers with the matched related acquirers and matched non-acquirers. Columns (1) through (6) present each of our measures of information asymmetry as the independent variable of interest. Column (7) uses low cash holdings as another proxy for information asymmetry (as well as financial constraints). Column (8) then includes all variables simultaneously. The results show that the level of *Degree* is negatively correlated with greater information asymmetry after controlling for firm

[7] Two recent merger papers that use *Degree* to measure customer-supplier relations are Ahern (2012) and Harford, Schonlau, and Stanfield (2012).

characteristics and industry and year effects.[8] This is consistent with firms that are more central having increased quality, relevance, and timeliness of information about that firm. Similarly, if the firm's industry has many customer and supplier industries then the information about the firm's industry will be more widely known. Note that this is simply an association—we do not expect that there is a causal relation between information asymmetry and how central a firm is.

4. Determinants of unrelated acquisitions

We hypothesize that unrelated acquisitions occur when acquirers face relatively higher external costs of capital, thereby constraining internal investment. Higher external costs of capital can be due to a variety of sources. We focus on adverse selection and argue that unrelated acquirers face higher information asymmetry than either non-acquirers or related acquirers (Hypothesis 1). We test this in Table 4 in two ways.

In Panel A, we consider logit specifications where the dependent variable takes a value of 0 if there is no acquisition, and 1 if there is a unrelated acquisition. We consider several empirical specifications, and in all of them we include additional controls for acquirer firm characteristics—firm size, firm Q, leverage, and cash flow—and acquirer industry characteristics—industry average Q, industry average leverage, and industry average cash flow divided by total assets. We also include industry and year effects in all specifications. In Column (1), we consider the relation between *Degree* and *Unrelated*. We expect that firms that are more central are less likely to engage in unrelated transactions, and this is what we find.

[8] In unreported results, we also find that *Degree* is negatively correlated with the implied cost of capital, although an obvious concern here is that the implied cost of capital is endogenous.

In Column (2), we find that firms with lower cash holdings as a fraction of total assets prior to the acquisition are more likely to engage in unrelated transactions. This finding is inconsistent with the hypothesis that firms engaging in unrelated transactions do so to squander excess cash. This finding is consistent with two other interpretations both of which support our argument. First, fewer cash holdings may imply that the firm is more informationally opaque, and thus provide a measure of information asymmetry. Second, fewer cash holdings may imply that the firm is more financially constrained and less able to fund internal investment.

Column (3) shows that firms with higher implied costs of capital are more likely to engage in unrelated transactions. This finding along with our previous finding that firms with lower cash holdings engage in unrelated acquisitions suggests that the unrelated acquirers are more financially constrained, and yet still engage in unrelated acquisitions.

In Column (4), the independent variables of interest are the asymmetric information variables: the level of firm intangibles, the level of firm discretionary accruals, the dispersion in analyst estimates, the bid-ask spread for the firm's stock price, the firm's industry Herfindahl index, and whether the firm has a debt rating. All of the coefficients on the information asymmetry variables suggest that greater information asymmetry about the acquirer is associated with a higher frequency of unrelated acquisitions than no acquisitions at all. In Column (5), we include all of the independent variables concurrently. As expected, given the association we found between *Degree* and the level of information asymmetry in Table 3, some of the information asymmetry variables are no longer significant. Nonetheless, our previous findings remain—firms that are less central, have smaller cash holdings, have higher costs of capital, and face greater information asymmetry engage in more unrelated transactions relative to matched firms engaging in no transactions.

In Panel B, we consider a logit specification where the dependent variable takes a value of 0 if there is a related acquisition and 1 if there is an unrelated acquisition. Because we are comparing unrelated acquisitions to related acquisitions in this panel, we include a full set of bid controls—the relative size of the target and the acquirer, the number of bidders, whether the offer is a cash offer, whether the acquirer has a toehold, whether the target is in a technology industry, whether there is a tender offer, whether the offer is hostile, or whether the offer is neither friendly or hostile. We also include the previously described acquirer and acquirer industry controls, as well as industry and year effects in all specifications. The independent variables of interest are the same as those described in Panel A. We find that firms that are less central, have smaller cash holdings, have higher costs of capital, and face greater information asymmetry engage in more unrelated transactions relative to matched firms engaging in related transactions. For subsequent results, we will use two stage specifications (Heckman and instrumental variables), and the first stage regressions will be the specifications in Column (1) in Panels A and B.

5. Performance of unrelated acquisitions

We now consider the performance of unrelated acquisitions. Our hypothesis is that unrelated acquirers suffer an adverse selection problem and thus have restricted access to capital. If the process of undertaking an acquisition reduces information asymmetry or if the acquisition allows the acquirer to make operational improvements, then we should see a positive effect on performance of the acquirer. Conversely, if unrelated acquirers are low-quality acquirers, or they overpay, then we should see a negative effect on performance. As a benchmark for unrelated acquirers, we use the related acquirers. We do this for two reasons. First, we are interested in examining announcement returns for unrelated acquirers. For non-acquirers, there is no announcement event, while there is one for related acquirers.

Second, there are clear economic rationales for why related acquisitions should be value-enhancing, from the elimination of double-marginalization for vertical mergers to market concentration for horizontal mergers. The rationales for why unrelated mergers should be value-enhancing are less clear, and are the focus of our study. A comparison of the two should be revealing.

A. Returns

We begin by examining cumulative abnormal announcement returns for related and unrelated acquisitions (Hypothesis 2). Acquirer abnormal returns are the abnormal return that the acquirer obtained around the acquisition announcement date. To get abnormal returns, we use the market model and the value-weighted index. The estimation period is 20 trading days to 210 trading days prior to the announcement of the acquisition. We use three event windows. The first window is three days—one trading day before to one trading day after the acquisition announcement day. The second window is five days—two trading days prior to two trading days after the acquisition announcement day. The third window is fourteen days—two trading days prior to eleven trading days after the acquisition announcement day.

The univariate statistics are in Table 5, Panel A. At the three day horizon, cumulative abnormal announcement returns are 150 basis points higher for unrelated acquisitions than for related acquisitions, and this difference is statistically significant. At the five day horizon, this difference is 158 basis points before shrinking to 119 basis points at the 14 day horizon, and these differences are statistically significant. While this simple comparison is suggestive, it is not definitive. We have not controlled for any differences across the two subsamples.

To address this concern, we examine the following ordinary least squares empirical specification:

$$y_{it} = \alpha + \beta_1 Unrelated_{it} + \beta' x_{it} + \gamma_i + \tau_t + \varepsilon_{it}, \quad (1)$$

where the dependent variable is cumulative abnormal announcement returns, *Unrelated* (our primary variable of interest) is a dummy variable equal to one if the acquisition is unrelated and zero if it is related, *x* is a vector of controls, γ are industry effects, and τ are year effects.[9] The results are in Table 5, Panel B. After controlling for acquirer, industry, and bid characteristics, we find that cumulative abnormal announcement returns are 101 basis points higher for unrelated acquisitions than for related acquisitions at the three day horizon. This difference grows to 118 basis points at the five day horizon and 167 basis points at the 14 day horizon. All of these differences are statistically significant.

Recall that our hypothesis is that information asymmetry results in the superior announcement performance of unrelated acquisitions. Specifically, firms with good but informationally opaque investment projects make unrelated acquisitions in order to fund their internal investment projects. If this is true, then the good firms that engage in unrelated acquisitions are also likely to be cash-constrained, since if they were not cash-constrained, they could fund internal investment projects directly. This then would imply that the positive announcement returns would be concentrated among the most cash-constrained unrelated acquirers. We test this in Table 5, Panel C. Here we split the sample at the median by the level of cash holdings. In the high cash holdings group, there are 521 unrelated acquirers and 486 related acquirers. In the low cash holdings group, there are 486 unrelated acquirers and 521 related acquirers. The distribution of unrelated and related acquirers is relatively evenly split across the high and low cash holdings groups. At the 3, 5, and 14 day horizons, announcement returns are positive and significantly higher for the unrelated acquirers with low cash holdings than for related acquirers with low

[9] We include in *x* a full set of acquirer controls, acquirer industry controls, and bid controls (see Table 4, Panel B for the full set), but omit them for brevity. The full tables are available upon request.

cash holdings. Announcement returns are not significantly higher for unrelated acquirers with high cash holdings than for related acquirers with high cash holdings. This finding supports the asymmetric information interpretation of our results.

The decision to undertake an unrelated acquisition is clearly a choice for the firm, and as a result, is endogenously determined. Indeed, we find that firms facing a higher degree of information asymmetry are the ones that engage in unrelated acquisitions. Table 5, Panel D, Columns (1) through (3) present the results from a two-stage Heckman selection specification to address the fact that engaging in an unrelated transaction is a choice and to correct for the firm's private information that leads to that choice. Using the method of Li and Prabhala (2008), we estimate the following two-stage Heckman selection model:

$$\begin{aligned} Unrelated_{it} &= \delta_0 + \delta_1 Degree_{it} + \delta' x_{it} + \gamma_i + \tau_t + v_{it}; \\ y_{it} &= \alpha + \beta_1 Unrelated_{it} + \lambda_{it} + \beta' x_{it} + \gamma_i + \tau_t + \varepsilon_{it}, \end{aligned} \tag{2}$$

where we include *Degree* in the first stage, and λ—the inverse Mills ratio from the first stage regression—in the second stage. The interpretation here is that there is unobserved private information about the acquirer's type that causes some acquirers to choose unrelated transactions. The inverse Mills ratio based on the variation from *Degree* corrects for this private information. The first stage regression is given in Table 4, Panel B, Column (1). For three-day and five-day acquirer abnormal returns, the inverse Mills ratio is significant in the second stage, suggesting that selection is important for the return difference we observe. Even after correcting for selection, we continue to find for all three return horizons that unrelated acquisitions have significantly higher announcement abnormal returns.

Second, to address more generalized endogeneity concerns, we instrument for the *Unrelated* dummy. While the information asymmetry variables used in Table 4 may seem like obvious candidates

for instruments, economically, measures of information asymmetry are likely to be correlated with abnormal returns independently of their impact on the unrelatedness of a merger. Instead, we use the variable *Degree* as our instrument. Recall that *Degree* measures the number of ties a firm's industry has with other industries. This industry characteristic should be exogenous to an acquirer's returns. On the other hand, *Degree* will be correlated with the likelihood of a firm engaging in a related transaction, since direct ties between two industries will imply a vertical relationship. The specification is:

$$Unrelated_{it} = \delta_0 + \delta_1 Degree_{it} + \delta' x_{it} + \gamma_i + \tau_t + v_{it}; \qquad (3)$$

$$y_{it} = \alpha + \beta_1 \overline{Unrelated_{it}} + \beta' x_{it} + \gamma_i + \tau_t + \varepsilon_{it}.$$

In the first stage, we regress the *Unrelated* dummy on *Degree* (see Table 4, Panel B, Column (1)), and in the second stage we regress cumulative abnormal announcement returns on the instrumented unrelated variable along with standard controls.

The results are in Table 5, Panel D, Columns (4) through (6). In the first stage, a firm in an industry with more ties to other industries has a lower likelihood of engaging in an unrelated acquisition. In the second stage, the predicted value for an unrelated acquisition is positively associated with cumulative abnormal announcement returns at the three, five, and fourteen day horizons. Our instrument is valid—the residuals from the second stage regression are uncorrelated with the instrument *Degree*, as can be seen at the bottom of Column (4). Importantly, across all six specifications, the coefficients on *Unrelated* are positive and significant, implying that unrelated acquisitions have higher announcement returns after correcting for both selection and endogeneity. These results are striking, in that they imply that on average at announcement, unrelated acquisitions are viewed as positive transactions, and much more so than related acquisitions.

B. Operating Performance

While announcement returns are very suggestive, we are also interested in whether the unrelated acquisitions lead to operational improvements or deterioration (Hypothesis 3). We next examine changes in operating performance from one year prior to one year after the acquisition. We do this for two different pairs of matched samples. In Table 6, Panel A, we examine unrelated acquirers matched with non-acquirers. In Table 6, Panel B, we examine unrelated acquirers matched with related acquirers. We do this because we want to examine operating performance for unrelated acquirers relative to benchmarks of no acquisitions and related (i.e., easily economically motivated) acquisitions. We use three measures of operating performance: sales growth, Tobin's Q, and return on assets. As measures of operating performance are likely to be partially determined by information asymmetry, which in turn is associated with the choice to engage in an unrelated transaction, we also present results for Heckman selection specifications for unrelated acquisitions using *Degree* as the primary determinant of selection.[10]

In Panel A, relative to non-acquirers, the results in the first three columns show that *Unrelated* is positively and significantly related to changes in operating performance. The last three columns show that this is also true in the Heckman selection model after correcting for the private information that leads firms to choose unrelated acquisitions. In Panel B, relative to related acquirers, the results show that for all measures, *Unrelated* is positively and significantly related to changes in operating performance. This is also true after correcting for the private information that leads firms to choose unrelated acquisitions. These operating improvements are interesting in their own right, as they suggest that unrelated acquisitions actually do lead to value improvements beyond just a decrease in information asymmetry for the acquirer. This is consistent with the unrelated acquirers being good types.

[10] In unreported results, the results are similar if we instrument using *Degree* instead.

C. Investment

We next dig deeper into the change in operating performance from prior to the acquisition to after the acquisition. Since these are unrelated acquisitions, one possibility is that the acquisitions allow firms to shift cash flows from one division to another—in effect, the acquisition allows the creation of an internal capital market (Hypothesis 4). Our hypothesis is that the acquirer pre-acquisition is capital-constrained (due to information asymmetry) and cannot invest in all positive-NPV projects. After the acquisition, the acquirer can cross-subsidize the acquirer's original divisions from target cash flows. To address this, we examine capital expenditures scaled by total assets in the acquirer's and in the target's pre-acquisition divisions.

In order to generate data on investment and cash flows by division, we use the Compustat Segment File. From the different business segments reported in Compustat, we identify those post acquisition segments that belonged either to the acquirer or the target. We first identify acquirers whose number of segments increased in the year of or in the year after the completion of the acquisition. Next, if the new segment's and the target's original SIC codes match, then we assign that new segment to be the target's original segment, while the other segments are called the acquirer's original segments. The data used for the acquirer segment is the sum of the corresponding values from the different non-target segments.

We examine investment levels and changes for the two different pairs of matched samples. In Table 7, Panels A and B, we examine unrelated acquirers matched with non-acquirers. In Table 7, Panels C and D, we examine unrelated acquirers matched with related acquirers. In Panels B and D, we present results for a Heckman selection specification where we correct for the private information that leads to unrelated transactions using *Degree*. In all cases, we control for additional acquirer and acquirer industry

characteristics, and for the comparison of unrelated and related acquirers, we also control for bid characteristics.

In Panel A, Column (1), we have the acquirer's original segments' level of capital expenditures after the acquisition. This investment level is higher for unrelated acquirers compared to non-acquirers. In Column (2), we take the difference in the investment level from one year after the acquisition to one year prior to the acquisition for the acquirer's original segments. This change in investment is higher for unrelated acquisitions. In Column (3), we have the target's original segments' level of capital expenditures after the acquisition. This investment level is lower for unrelated acquirers relative to non-acquirers. In Column (4), we take the difference in the investment level from one year after the acquisition to one year prior to the acquisition for the target's original segments. This change in investment is lower for unrelated acquisitions, showing that unrelated acquirers reduce investment in target segments more than matched non-acquired targets do. Interestingly, in all columns, for both acquirer's segments and target's segments, the investment level and change is increasing in target segment cash flows. The same is not true for acquirer segment cash flows—acquirer segment investment is higher, while target segment investment is lower (although the target segment change in investment results are not statistically significant).

In Panel B, we present the Heckman selection results after correcting for the private information that leads firms to choose unrelated acquisitions. The results are quite similar. Overall, in unrelated transactions relative to non-acquisitions, investment generally increases for the acquirer's segments and decreases for the target's segments.

In Table 7, Panel C, we compare related acquirers with unrelated acquirers. Here we add columns (5) and (6) to examine cases of related acquirers who are vertically related. We do this because

we do not have data on independent segments for horizontal mergers, as by definition, the segments are in the same industry. The investment level and change is higher for the acquirer's original segments for unrelated acquisitions than for related acquisitions. Conversely, the investment level and change is lower for the target's original segments for unrelated acquisitions than for related acquisitions, whether we examine all related acquisitions or just those from vertical transactions. In all cases, investment levels and changes are increasing in target cash flows. However, acquirer cash flows are positively associated with acquirer segment investment levels and changes, but are negatively related to target segment investment levels and changes. These results continue to hold when we correct for the private information that leads firms to choose unrelated acquisitions in Panel D.

D. Investment-Cash Flow Sensitivities

Our previous results establish that target investment levels and changes are negatively related to acquirer cash flows, but do not show that there is a differential impact across unrelated and related or no acquisitions. As a final test of performance, we examine investment-cash flow sensitivities post–acquisition for unrelated acquisitions relative to our two matched samples (Hypothesis 5). In Table 8, Panels A and B, we examine unrelated acquirers matched with non-acquirers. In Table 8, Panels C and D, we examine unrelated acquirers matched with related acquirers. The results are similar across all four panels, so we discuss them together. We are primarily interested in the interaction between *Unrelated* and the various segments' cash flows. In Panel A, Column 1, we examine the investment levels of the acquirer's segments. For unrelated transactions, the investment level is increasing more in both the target segment and acquirer segment cash flows. In other words, investment-cash flow sensitivities are greater for acquirer segments in unrelated transactions than for no acquisitions.

By contrast, in Column 3, investment-cash flow sensitivities are decreasing for target segments in unrelated transactions. This is true for cash flows from both the acquirer's segments and the target's segments. The interpretation of this is that not only does investment shift from the target's segments to the acquirer's segments, but the sensitivity of investment to cash flow increases for the acquirer's segments but decreases for the target's segments. This is consistent with target segments cross-subsidizing acquirer segments in unrelated transactions. In Columns 2 and 4, we examine the change in the investment level from one year prior to the acquisition to one year after the acquisition. The results are similar. In Panel B, we present results from the Heckman selection model. The results are unaffected. In Panel C, we compare related acquirers to unrelated acquirers. As before, we add two columns for related acquirers engaged in strictly vertical transactions. We again find that the acquirer's segments' investment-cash flow sensitivity increases while the target's segments investment-cash flow sensitivity decreases for unrelated transactions relative to related transactions. Finally, in Panel D, we present results from our Heckman selection model, and our results are unaffected. Overall, these results are consistent with unrelated acquirers shifting investment from target segments to acquirer segments more so than do related or non-acquirers. This could be due to internal capital markets and cross-subsidization or to a reduction in inefficient investment by the unrelated targets. We will examine this second possibility in greater detail in Section 7.

6. Access to financing for unrelated acquirers

Given that unrelated acquirers have higher levels of information asymmetry, it is natural to wonder if they have restricted access to financing. In Table 4, we showed that unrelated acquirers have smaller cash holdings than do non-acquirers or related acquirers, after controlling for acquirer, industry, and bid characteristics. We also showed that unrelated acquirers have higher implied costs of capital both

unconditionally and after controlling for acquirer, industry, and bid characteristics. Now we examine the method of payment used by unrelated acquirers to see if they use more stock than do related or non-acquirers. We hypothesize that if unrelated acquirers are more financially constrained (possibly due to facing higher degrees of information asymmetry), then they will be more likely to use stock to pay for their acquisitions (Hypothesis 6).

Table 9, Panel A, presents summary statistics on sources of financing for related versus unrelated transactions. We find that unrelated acquirers pay more with cash than stock than do related acquirers. This univariate finding seems inconsistent with unrelated acquirers being more financially constrained than related acquirers. In Panel B, we present more formal tests of financing by unrelated acquirers. In the first two columns, we present OLS regressions of the method of financing (all stock in Column (1) and percentage of stock in Column (2)) on whether the acquisition is unrelated or related as well as a number of acquirer characteristics, deal characteristics, and industry and year indicators. After controlling for acquirer, acquirer industry, and bid characteristics, we find that unrelated acquirers use more stock in their acquisitions and are more likely to engage in all-stock transactions.

In the third and fourth columns, we present results from a two-stage Heckman selection model, where we include *Degree* in the first stage. Our previous results, that unrelated acquirers use more stock, are unaffected.[11] Coupled with our previous results that unrelated acquirers have higher implied costs of

[11] In unreported results, we also examine the banking relationships that an acquirer has. Prior to an acquisition, unrelated acquirers suffer a reduction in the number of banking relationships, while related acquirers show a substantial increase in banking relationships, consistent with unrelated acquirers being more informationally opaque prior to acquisitions. During the acquisition period, both unrelated acquirers and related acquirers show an increase in the number of banking relationships, although the increase is much larger for related acquirers, consistent with both types of acquirers needing advisory services as well as financing during the acquisition, but with the related acquirers having greater access. Finally, in the post-acquisition period, unrelated acquirers show a small increase in the number of banking relationships, while related acquirers show a decrease in the number of banking relationships.

capital and fewer cash holdings, these results suggest that unrelated acquirers are more financially constrained than related acquirers, possibly due to the higher level of information asymmetry that characterizes unrelated acquirers.

7. Alternative Explanations

A natural alternative explanation for our results is that the unrelated mergers we examine are actually disciplinary takeovers. Under this explanation, firms or managers with general skills acquire underperforming firms outside of the acquirers' industries and then improve performance of the target firms. Such an explanation would be consistent with our findings that post-merger there are increases in operating performance as well as decreases in (inefficient) investment in the target segments.

In order to examine this explanation, we consider pre-merger investments and performance for the target firms in our sample. If unrelated mergers really are disciplinary mergers that reduce inefficient investment and improve operating performance, then we should see that the unrelated targets have worse operating performance and more inefficient investment than the related targets prior to the acquisitions. Table 10 presents results on operating performance and investment efficiency for related and unrelated target companies.

In other unreported results, we also examine the change in the volume of large loans divided by total assets. We focus on large loans because these are the loans that are likely to be used as a source of financing for acquisitions as well as corporate investment. Prior to the acquisition, unrelated acquirers show a decrease in the fraction of large loans, while related acquirers show an increase, consistent with a reduction in access to financing for unrelated acquirers. During the acquisition period, both unrelated and related acquirers show a small decrease in the fraction of large loans, which is the result of a denominator effect—assets grow more than debt if the acquisition is partially financed with equity. In the post-acquisition period, the fraction of large loans grows for unrelated acquirers, while it shrinks markedly for the related acquirers, consistent with the acquisition relaxing the information asymmetry for unrelated acquirers and thus allowing the unrelated acquirers greater access to capital.

In Columns (1) through (3), the positive coefficients on *Unrelated* show that for all operating performance measures, unrelated targets perform better pre-acquisition than do related targets. Second, the negative coefficients on investment and positive coefficients on investment interacted with *Unrelated* show that more investment is associated with worse operating performance for related targets pre-acquisition, while more investment is associated with generally positive operating performance for unrelated targets. In Columns (4) and (5), we consider two measures of return on investment and ask whether unrelated targets had better or worse return on investment pre-acquisition than did related targets. For both measures, we find that the pre-acquisition return on investment is better for unrelated targets than for related targets. These results contradict what we expect to find if unrelated acquisitions are disciplinary.

Thus far, we have interpreted unrelated acquirers as acquirers facing higher degrees of information asymmetry. An alternative interpretation is that unrelated acquirers are diversifying acquirers who may diversify for many reasons (tax, growth opportunities, etc.) that are independent of information asymmetry. While we have already demonstrated linkages between unrelatedness and information asymmetry, here we consider more explicitly whether our results can be attributed to information asymmetry. In Table 11, we split our sample into high information asymmetry groups and low information asymmetry groups using two of our explicitly information asymmetry variables—the use of discretionary accruals and the presence of intangibles. We then ask whether unrelatedness matters for returns, performance, and investment within each subsample.

Panel A examines three day cumulative abnormal returns for acquirers. For both measures of information asymmetry, positive and significant returns from unrelated transactions are only found for the high information asymmetry group. Unrelated transactions that occur when information asymmetry is

low generate no positive abnormal returns. Panel B examines two measures of operating performance (Tobin's Q and return on assets) along with our two measures of information asymmetry (accruals and intangibles). In all four cases, unrelated transactions are only associated with better operating performance for the high information asymmetry group. Panel C examines investment and shows that unrelated transactions are significantly associated with more acquirer firm segment investment and less target firm segment investment only for the high information asymmetry group. Panel D examines investment-cash flow sensitivities by target versus acquirer segment, and shows that the more positive investment-cash flow sensitivity for acquirer segments and more negative investment-cash flow sensitivity for target segments occurs only in the high information asymmetry groups. Collectively, these results demonstrate that information asymmetry seems to drive our earlier findings for unrelatedness.

8. Conclusion

We examine an underexplored aspect of the market for corporate control. The largest fraction of acquisitions occurs between unrelated firms—acquisitions that cannot be characterized as either horizontal or vertical mergers. We examine the characteristics of unrelated acquirers and find that multiple measures of information asymmetry or opaqueness are correlated with unrelated acquirer status. Consistent with this, we find that unrelated acquirers have higher costs of capital and use more stock for financing their acquisitions. They thus seem to be constrained relative to accessing financing.

Nonetheless, we find that unrelated acquisitions have positive cumulative abnormal announcement returns and outperform related acquisitions. Post-merger operating performance is also quite positive, suggesting that these are value-creating mergers. When we look more closely for sources of value creation, we find that post-merger for unrelated acquisitions, target firm segments' cash flows are used to finance acquirer firm segments' investments. This is consistent with unrelated acquisitions

occurring to create an internal capital market where target firm cash flows cross-subsidize acquiring firm investments.

It is important to note that we do not claim that this cross-subsidization is inefficient. Indeed, operating performance increases post acquisition in unrelated acquisitions, suggesting that these transactions are value-enhancing. Our interpretation of these results is that greater investment in the acquirer's segments ex ante would have been optimal. Yet this investment does not happen until after the target and its cash flows are acquired. This is consistent with the acquirer facing an information asymmetry problem which increases the cost of raising capital for investment. Why is the acquirer able to raise capital to acquire the target but not to fund internal investment? One possibility here is that an external investment does not face the same information asymmetry problem that an internal investment does. An external acquisition may not contain much private information and can therefore be valued and financed. Since the external acquisition will generate future cash flows, these cash flows can be used to finance the internal investments that are otherwise opaque.

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Table 1: Summary Statistics for Relatedness

This table presents summary statistics for related and unrelated mergers using all public acquirers with public targets for the time period 1997 to 2007. A related merger is any merger that is either horizontal or vertical, and an unrelated merger is any merger that is not related. A vertical merger is any merger in which either buyer-supplier inputs or outputs exceed one percent of the dollar value of sales between the acquirer's and target's industries. A horizontal merger is any merger involving two firms in the same industry as in Hoberg and Phillips (2010). We also present statistics on how correlated the acquirer and target are. For the customer correlation, we first calculate how much the acquirer's industry supplies to each industry in percentages, and then do the same for the target's industry. The customer correlation is then the correlation of the shares supplied by the acquirer's and target's industries to all of the industries. For the supplier correlation, we calculate how much the acquirer's industry receives as inputs from each industry in percentages, and then do the same for the target's industry. The supplier correlation is then the correlation of the shares purchased by the acquirer's and target's industries from all of the industries.

	Number of Acquisitions	% of Total Acquisitions	Customer Correlation	Supplier Correlation
Unrelated	1,007	42.57	0.1098	0.1792
Horizontal	752	31.80	1	1
Vertical	606	25.62	0. 6443	0. 6928
Total Acquisitions	2,365			

Table 2: Summary Statistics of Matched Sample

In Panels A and D, Columns (1) through (3) report mean values for pre-merger acquirer firm characteristics. Pre-merger variables are measured in the fiscal year preceding the announcement of the merger. Unrelated acquirers are matched to related acquirers and then separately to non-acquirers based on size, industry and year. The unrelated and related acquirers are required to have a public target. In Panel A, Columns (4) and (5) present summary statistics on the closeness of the match for the different firm characteristics. In Panel D, Columns (4) and (5) present summary statistics on the closeness of the matched firms for the different information asymmetry variables. In general, there are 1,007 observations for each variable. In Panel D, some variables have missing values for some observations—for these variables, the number of observations is given in brackets below the mean. In Panel B, Columns (1) through (3) report mean values for pre-merger target firm characteristics from the matches described above. For targets of non-acquirers (Column (2)), we choose Compustat firms matched on size, industry, and year to the target firm of the unrelated acquirers, excluding all firms used in our previous matching exercises, specifically those chosen as non-acquirers. In Panel C, Columns (1) through (3) report mean values for post-merger combined firm characteristics. The post-merger period is the one fiscal year after the fiscal year in which the merger is completed. For Column (2), the No Acquisitions combined firms are the combination of the No Acquisitions acquirers from Panel A and the No Acquisitions targets from Panel B. Columns (4) and (5) present summary statistics on the closeness post-merger of the matched firms for the different firm characteristics. See Appendix A for variable definitions. All variables have been winsorized at half a percent. * and ** represent statistical significance at the 5% and 1% levels.

Panel A: Pre-Merger Acquirer Firm Characteristics					
	Unrelated	No Acquisitions	Related	(1)-(2)	(1)-(3)
	(1)	(2)	(3)	(4)	(5)
Investment	0.0683	0.0732	0.0804	-0.0049	-0.0121*
Size	5.1247	4.9080	5.6506	0.2167	-0.5259
Q	1.6552	1.6832	1.6687	-0.028	-0.0135
Cash holding	0.1524	0.1327	0.1451	0.0197	0.0073
Leverage	0.4527	0.5128	0.4810	-0.0601	-0.0283
Cashflow	0.0686	0.0749	0.0717	-0.0063	-0.0031
No. of Obs.	1007	1007	1007		
Panel B: Pre-Merger Target Matched Firm Characteristics					
	Unrelated	No Acquisitions	Related	(1)-(2)	(1)-(3)
	(1)	(2)	(3)	(4)	(5)
Investment	0.1023	0.0518	0.0527	0.0505**	0.0496**
Size	4.2486	4.6459	5.1572	-0.3973	-0.9086
Q	1.9251	1.6948	1.2418	0.2303	0.6833*
Cash holding	0.1683	0.1354	0.1392	0.0329	0.0291
Leverage	0.4305	0.5302	0.7427	-0.0997*	-0.3122**
Cashflow	0.1313	-0.0082	0.0282	0.1395**	0.1031**
No. of Obs.	1007	1007	1007		

Panel C: Post-Merger Combined Firm Characteristics					
	Unrelated	No Acquisitions	Related	(1)-(2)	(1)-(3)
	(1)	(2)	(3)	(4)	(5)
Investment	0.0954	0.0645	0.0748	0.0309**	0.0206**
Size	6.5150	6.7636	6.6506	-0.2486**	-0.1356**
Q	1.9422	1.7937	1.7879	0.1485**	0.1543**
Cash holding	0.1438	0.1265	0.1221	0.0173**	0.0217**
Leverage	0.4855	0.5593	0.6920	-0.0738	-0.2065**
Cashflow	0.0735	0.0453	0.0426	0.0282*	0.0309*
No. of Obs.	1007	1007	1007		
Panel D: Pre-Merger Acquirer Information Asymmetry					
	Unrelated	No Acquisitions	Related	(1)-(2)	(1)-(3)
	(1)	(2)	(3)	(4)	(5)
Intangibles	0.0578	0.0300	0.0272	0.0278	0.0306
	[987]	[989]	[972]		
Discretionary	0.0339	0.0264	0.0197	0.0075	0.0142
Accrual	[984]	[983]	[964]		
Analyst	0.1952	0.1732	0.1725	0.022	0.0227**
Dispersion	[971]	[971]	[938]		
Bid-Ask Spread	0.2863	0.2703	0.2726	0.016	0.0137
	[1001]	[1004]	[988]		
Herfindahl Index	0.1735	0.1652	0.084	0.0083	0.0895**
Rating	0.0734	0.0769	0.1405	-0.0035	-0.0671**
Implied Cost	0.0819	0.0732	0.0727	0.0087	0.0092**
of Capital	[991]	[989]	[980]		
Degree	0.0320	0.1038	0.1601	-0.0718	-0.1281**

Table 3: Regression of Degree on Information Asymmetry Variables

This table presents the assocation between Degree and the information asymmetry variables using OLS regression with robust standard errors. The sample consists of unrelated acquirers, matched related acquirers, and matched non-acquirers. The independent variables are measured one-year before the acquisition and are for the acquirer. Year and industry dummies are included but not reported. *, ** represent statistical significance at the five percent and one percent level respectively.

Degree	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Information Asymmetry								
Intangibles	-0.0038							-0.0161
	(0.0011)**							(0.0057)**
Disc.		-0.0001						-0.0021
Accruals		(0.0000)**						(0.0008)**
Analyst			-0.0006					-0.0001
Dispersion			(0.0002)**					(0.0000)**
Bid-Ask				-0.0019				-0.0048
Spread				(0.0004)**				(0.0014)**
Herfindahl					-0.0067			-0.0099
					(0.0018)**			(0.0036)**
Debt						0.0045		0.0168
Rating						(0.0013)**		(0.0066)*
Cash							0.0232	0.0059
Holding							(0.0083)**	(0.022)**
Firm								
Size	0.0045	0.0043	0.0030	0.0027	0.0032	0.0032	0.0054	0.0030
	(0.0019)*	(0.0022)	(0.0017)	(0.0017)	(0.0018)	(0.0016)*	(0.0020)*	(0.0022)
Q	-0.0002	-0.0001	-0.0001	-0.0007	-0.0001	-0.0001	-0.0004	-0.0004
	(0.0003)	(0.0001)	(0.0002)	(0.0005)	(0.0001)	(0.0001)	(0.0003)	(0.0006)
Leverage	0.0012	-0.0007	0.0032	0.0246	0.0028	0.0032	0.0035	-0.0001
	(0.0016)	(0.0012)	(0.0025)	(0.0148)	(0.0024)	(0.0025)	(0.0020)	(0.0026)
Cashflow	-0.0060	-0.0070	-0.0073	-0.0203	-0.0074	0.0074	0.0057	-0.0099
	(0.0033)	(0.0037)	(0.0032)*	(0.0103)	(0.0031)*	(0.0032)*	(0.0030)	(0.0044)*
Constant	0.0623	0.0704	0.0706	0.1067	0.0764	0.0701	0.0498	0.0833
	(0.0099)**	(0.0099)**	(0.0089)**	(0.0152)**	(0.0112)**	(0.0090)**	(0.0131)**	(0.0082)**
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.45	0.33	0.48	0.49	0.48	0.08	0.07	0.59
Obs.	2949	2932	2881	2995	3021	3021	3021	2927

Table 4: Asymmetric Information Measures as Predictors of Unrelated Acquirers

This table presents logit regressions where the dependent variable takes the value of zero for no acquisition (Panel A) or a related acquisition (Panel B) and one for an unrelated acquisition. Panel A uses the no acquisition propensity score matched sample and Panel B uses the related acquisition propensity score matched sample, where in both cases the match is done to the unrelated acquirer sample based on size, year and industry. The independent variables are measured one-year before the acquisition and are for the acquirer. In Panel A, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. Robust standard errors are in parentheses. Year and industry dummies are included but not reported. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Panel A: Comparing Non-Acquirers to Matched Unrelated Acquirers

Unrelated	(1)	(2)	(3)	(4)	(5)
Information Asymmetry					
Degree	-0.0064				-0.0047
	(0.0024)**				(0.0011)**
Cash		-0.5834			-0.6628
Holding		(0.1943)**			(0.2064)**
Implied Cost of Capital			0.0086		0.0052
			(0.0025)**		(0.0019)**
Intangibles				0.0114	0.0594
				(0.0050)*	(0.0195)**
Disc.				0.0109	0.3992
Accruals				(0.0508)**	(0.1555)*
Analyst				0.0173	0.0246
Dispersion				(0.0051)**	(0.0068)**
Bid-Ask				1.0336	3.1345
Spread				(0.2643)**	(1.1780)**
Herfindahl				1.8637	1.5777
				(0.3240)**	(0.3868)**
Debt				-0.1075	-0.3951
Rating				(0.0306)**	(0.1559)*
Acquirer					
Size	0.1411	0.1642	0.1287	0.0612	0.0278
	(0.1201)	(0.1221)	(0.1340)	(0.0317)	(0.0579)
Q	0.0206	0.0269	0.0407	0.0289	0.0654
	(0.0086)*	(0.0089)**	(0.0147)**	(0.0092)**	(0.0176)**
Leverage	-0.0590	-0.0418	-0.1783	-0.0485	-0.0779
	(0.0884)	(0.0857)	(0.2339)	(0.0960)	(0.2561)
Cashflow	0.0794	0.0583	0.1575	0.0234	0.5391
	(0.1131)	(0.1153)	(0.3544)	(0.1218)	(0.3804)
Acquirer Industry					
Q	-0.0553	-0.2685	-0.0697	-0.6131	-0.1691
	(0.6982)	(0.6755)	(0.8311)	(0.5721)	(0.4710)
Leverage	-0.0642	-0.0598	-0.0902	-0.0353	-0.0516
	(0.1660)	(0.1468)	(0.1734)	(0.6356)	(0.1501)
Cashflow	-1.8843	-1.4503	-1.1393	-1.6525	-1.5972
	(0.7893)*	(0.8030)	(0.8782)	(1.2526)	(1.1131)
Constant	1.1784	0.4077	1.6198	1.2859	1.0764
	(0.8681	(0.1692)	(0.2293)	(1.3089)	(1.2473)

Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.21	0.16	0.17	0.17	0.23
Obs.	2014	2014	1986	1917	1917

Panel B: Comparing Related Acquirers to Matched Unrelated Acquirers					
Unrelated	(1)	(2)	(3)	(4)	(5)
Information Asymmetry					
Degree	-0.0021				-0.0037
	(0.0007)**				(0.0012)**
Cash		-0.2184			-0.3769
Holding		(0.0768)**			(0.1285)**
Implied Cost of Capital			0.0368		0.0254
			(0.0141)**		(0.0096)**
Intangibles				0.0155	0.2530
				(0.0055)**	(0.0963)**
Disc.				0.3331	0.2001
Accruals				(0.0998)**	(0.0791)*
Analyst				0.0228	0.0219
Dispersion				(0.0052)**	(0.0096)*
Bid-Ask				2.0934	1.8215
Spread				(0.8011)**	(0.6828)**
Herfindahl				0.5906	0.2315
				(0.1832)**	(0.0958)**
Debt				-0.1814	-0.2238
Rating				(0.0603)**	(0.0798)**
Acquirer					
Size	0.3622	0.4089	0.2460	0.2342	0.0807
	(0.2513)	(0.3591)	(0.1767)	(0.1063)*	(0.1602)
Q	0.0022	0.0132	0.0907	0.0153	0.1433
	(0.0007)**	(0.0294)	(0.0244)**	(0.0054)**	(0.0418)**
Leverage	-0.5458	-0.1629	-1.0941	-0.7437	-0.9828
	(0.4166)	(0.3912)	(0.6709)	(0.5480)	(0.7320)
Cashflow	0.8017	0.6240	0.1160	0.6402	0.2354
	(0.3216)*	(0.1673)**	(0.0385)**	(0.3921)	(0.5119)
Acquirer Industry					
Q	-0.7985	-0.4938	-0.7462	-0.9716	-0.3424
	(0.6256)	(0.6315)	(0.7843)	(0.3210)**	(0.3420)
Leverage	-0.0070	-0.0073	-0.1868	-0.7503	-0.1208
	(0.0855)	(0.0855)	(0.1106)	(0.5281)	(0.9877)
Cashflow	-1.3817	-1.4058	-0.6120	-1.2709	-1.0690
	(0.5270)**	(0.7022)*	(0.9250)	(0.3040)**	(0.3982)**
Bid					
Relative	-0.0072	-0.0071	-0.0044	-0.0898	-0.1616
Size	(0.0035)*	(0.0031)*	(0.0054)	(0.0961)	(0.4201)
Bidders	-0.1831	-0.1550	-0.2037	-0.2770	-1.3295
	(0.2046)	(0.2031)	(0.2607)	(0.8545)	(0.4430)**
Cash	-0.0258	-0.0396	-0.0968	-0.1503	-0.5738
	(0.0097)**	(0.0155)*	(0.0334)**	(0.0525)**	(0.2162)**
Toehold	0.1338	0.1413	0.4194	0.5202	0.2621
	(0.1419)	(0.1438)	(0.1725)*	(0.8156)	(0.4740)
Hi-tech	0.1725	0.1787	0.2546	0.0616	1.4524
	(0.0877)*	(0.0889)*	(0.1094)*	(0.3604)	(0.8886)
Tender Offer	0.0009	0.0377	0.0150	0.1523	0.3336
	(0.1494)	(0.1511)	(0.1728)	(0.7088)	(1.1500)
Hostile	0.7956	0.8049	0.8799	0.2764	0.5352
	(0.7635)	(0.7576)	(0.8598)	(0.5439)	(1.4946)

Neutral	0.0072	0.0071	0.0044	0.0898	0.1616
	(0.0035)*	(0.0031)*	(0.0054)	(0.0961)	(0.4201)
Constant	3.4751	3.6502	3.2861	2.0703	2.6112
	(1.0282)**	(1.0272)**	(1.3654)*	(0.7658)**	(0.9462)**
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.19	0.16	0.17	0.18	0.22
Obs.	2014	2014	1970	1888	1888

Table 5: Acquirer Returns for Unrelated Mergers

This table (all panels) presents cumulative abnormal announcement returns (CAR), calculated using the market model and the equally weighted index. The estimation window is 20 trading days to 210 days prior to the announcement. For Acquirer CAR 3 days, the event window is one trading day before to one trading day after the announcement. For Acquirer CAR 5 days, the event window is two trading days prior to two trading days after the announcement. For Acquirer CAR 14 days, the event window is 2 trading days prior to the announcement to 11 trading days after the announcement. In Panel C, the odd numbered columns report results for firms that have cash holdings at and below the median (486 unrelated acquisitions and 521 related acquisitions). The even numbered columns report results for firms that have cash holdings above the median value (521 unrelated acquisitions and 486 related acquisitions). In Panel D, The first three columns present Heckman two stage regressions and the last three columns present instrumental variable regressions with *Unrelated* as the dependent variable in the first stage. The first stage in all specifications is Table 4, Panel B, Column (1). LR Chi 2 is the Likelihood Ratio Chi squared test value reported in the logit regression of *Unrelated* and *Degree*. Correlation reports the correlation between the residual of the second stage regression (the dependent variable is the acquirer CAR) with *Degree*. In all panels, robust standard errors are in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Panel A: Univariate Comparison

Variable	Full Sample (1)	Unrelated (2)	Related (3)	Column (2) – Column (3) (4)
Acquirer CAR 3 days	0.0036	0.0111**	-0.0039**	0.0150**
Acquirer CAR 5 days	0.0053*	0.0132**	-0.0026*	0.0158**
Acquirer CAR 14 days	-0.0003	0.0057	-0.0062**	0.0119*
No. of Observations	2014	1007	1007	

Panel B: OLS Regression Specification

Acquirer CAR	3 Days (1)	5 Days (2)	14 Days (3)
Unrelated	0.0101	0.0118	0.0167
	(0.0027)**	(0.0031)**	(0.0043)**
Acquirer Controls	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes
Industry	Yes	Yes	Yes
Year	Yes	Yes	Yes
Adj. R2	0.03	0.03	0.04
No. of Observations	2014	2014	2014

Panel C: Sorting on Cash Holdings						
Acquirer CAR	3 Days		5 Days		14 Days	
	Low Cash	High Cash	Low Cash	High Cash	Low Cash	High Cash
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.0108	0.0071	0.0125	0.0083	0.0234	0.0063
	(0.0028)**	(0.0043)	(0.0034)**	(0.0052)	(0.0065)**	(0.0046)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.05	0.03	0.06	0.03	0.04	0.03
Obs.	1007	1007	1007	1007	1007	1007

Panel D: Endogeneity and Selection Specification						
	Heckman Selection			Instrumental Variable		
Acquirer CAR	3 Days	5 Days	14 Days	3 Days	5 Days	14 Days
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.0094	0.0110	0.0162	0.0075	0.0086	0.0103
	(0.0027)**	(0.0029)**	(0.0042)**	(0.0024)**	(0.0028)**	(0.0038)**
Inverse Mills Ratio	-0.0158	-0.0181	-0.0138			
	(0.0051)**	(0.0058)**	(0.0080)			
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.04	0.04	0.05	0.03	0.03	0.04
Obs.	2014	2014	2014	2014	2014	2014
IV Tests						
LR Chi2				63.26**		
Correlation				0.04		

Table 6: Changes in Operating Performance

Panel A: Comparing Matched Non-Acquirers and Unrelated Acquirers

We match non-acquirers to unrelated acquirers. We examine changes in operating performance around the merger—the dependent variables are measured as the change from one year before to one year after the merger. The combined acquirer and target firm is used to calculate the pre-acquisition numbers. For matching non-acquiring firm-years, we use the two year change in the dependent variables matched in calendar time to the unrelated acquisitions. Sales growth is calculated as post acquisition sales/pre-acquisition sales. For these specifications, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. Columns (1), (2), and (3) are OLS regressions. Columns (4), (5), and (6) are Heckman selection specifications, where the first stage regression is given by Table 4, Panel A, Column (1). Robust standard errors are reported in parentheses below the estimate. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	OLS			Heckman		
	Sales Growth	Q	ROA	Sales Growth	Q	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.1363	0.1282	0.1202	0.1001	0.1461	0.1590
	(0.0493)**	(0.0391)**	(0.0457)**	(0.0377)**	(0.0393)**	(0.0574)**
Inverse Mills Ratio				-0.3879	-0.0704	-0.5278
				(0.1449)**	(0.0384)	(1.1806)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.12	0.10	0.14	0.13	0.10	0.14
Obs.	2014	2014	2014	2014	2014	2014

Panel B: Comparing Matched Related Acquirers and Unrelated Acquirers

We match related acquirers to unrelated acquirers. We examine changes in operating performance around the merger—the dependent variables are measured as the change from one year before to one year after the merger. The combined acquirer and target firm is used to calculate the pre-acquisition values. Sales growth is calculated as post acquisition sales/pre-acquisition sales. Columns (1), (2), and (3) are OLS regressions. Columns (4), (5), and (6) are Heckman selection specifications, where the first stage regression is given by Table 4, Panel B, Column (1). Robust standard errors are reported in parentheses below the estimate. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	OLS			Heckman		
	Sales Growth	Q	ROA	Sales Growth	Q	ROA
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.1098	0.0738	0.2712	0.0764	0.0713	0.2137
	(0.0389)**	(0.0284)**	(0.0964)**	(0.0239)**	(0.0271)**	(0.0746)**
Inverse Mills Ratio				-0.5736	-0.1316	-0.8492
				(0.6199)	(0.7314)	(0.7288)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.10	0.13	0.14	0.10	0.13	0.14
Obs.	2014	2014	2014	2014	2014	2014

Table 7: Segment Investment

Panel A: Comparing Matched Non-Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to non-acquirers. We examine the level and change in investments (capital expenditure/total assets) for target and acquirer segments. For the level specifications (Columns (1) and (3)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. The Segments Dummy takes the value of one if the firm has 3 or more segments. For this specification, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target	
	Level	Change	Level	Change
	(1)	(2)	(3)	(4)
Unrelated	0.1325	0.1712	-0.0093	-0.0123
	(0.0504)**	(0.0779)*	(0.0033)**	(0.0038)**
Segment				
Target Cashflow	0.0592	0.0628	0.0932	0.0262
	(0.0188)**	(0.0209)**	(0.0282)**	(0.0104)**
Acquirer Cashflow	0.1549	0.2829	-0.1201	-0.1583
	(0.0509)**	(0.0794)**	(0.0391)**	(0.1415)
Sales Growth	0.0002	0.0049	0.0005	0.0004
	(0.0003)	(0.0028)	(0.0003)	(0.0008)
Segments Dummy	0.1241	0.0599	-0.0176	-0.0109
	(0.2521)	(0.0875)	(0.0236)	(0.0248)
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.26	0.17	0.22	0.16
Obs.	4028	4028	4028	4028

Panel B: Heckman Selection Specification Comparing Matched Non-Acquirers as Control Firms

The dependent variable is investment (capital expenditure/total assets) by segment, so that multiple segments per firm are used. Change is the difference between the post-merger and pre-merger values of the segments. Segments Dummy takes the value of one if the firm has 3 or more segments. The inverse mills ratio is from Table 4, Panel A, Column (1). For this specification, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target	
	Level	Change	Level	Change
	(1)	(2)	(3)	(4)
Unrelated	0.1430	0.1597	-0.0501	-0.0115
	(0.0534)**	(0.0579)**	(0.0158)**	(0.0036)**
Segment				
Target Cashflow	0.0462	0.0766	0.0704	0.0218
	(0.0102)**	(0.0282)**	(0.0201)**	(0.0071)**
Acquirer Cashflow	0.1620	0.2901	-0.1386	-0.1416
	(0.0614)**	(0.0932)**	(0.0489)**	(0.0483)**
Sales Growth	0.0002	0.0049	0.0005	0.0004
	(0.0004)	(0.0031)	(0.0004)	(0.0007)
Segments Dummy	0.1161	0.0607	-0.0160	-0.0117
	(0.2702)	(0.0743)	(0.0247)	(0.0260)
Inverse Mills Ratio	-0.3442	-0.5669	-0.0783	-0.0491
	(0.3375)	(0.5913)	(0.0419)	(0.2303)
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.27	0.19	0.23	0.17
Obs.	4028	4028	4028	4028

Panel C: Related Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to related acquirers. For Columns (3) and (4), Target includes both vertical and horizontal targets, while for Columns (5) and (6), Vertical Target includes only acquisitions classified as having vertical targets. Level is the investments (capital expenditure/total assets). For the level specifications (Columns (1), (3), and (5)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. Segments Dummy takes the value of one if the firm has 3 or more segments. * and ** represent statistical significance at the five percent and one percent levels, respectively. There are 3671 acquirers and targets of related and unrelated acquisitions. Vertical acquirers and targets are 764 observations, and horizontal acquirers are 893 observations. Thus, columns (5) and (6) report 2014+764=2778 observations.

	Acquirer		Target		Vertical Target	
	Level	Change	Level	Change	Level	Change
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.0047	0.0116	-0.0196	-0.0280	-0.0279	-0.0358
	(0.0014)**	(0.0044)**	(0.0070)**	(0.0107)**	(0.0125)*	(0.0132)**
Segment						
Target Cashflow	0.0966	0.0414	0.0633	0.0184	0.0754	0.0250
	(0.0169)**	(0.0149)**	(0.0187)**	(0.0068)**	(0.0201)**	(0.0095)**
Acquirer Cashflow	0.1190	0.1566	-0.0199	-0.0097	-0.0239	-0.0181
	(0.0361)**	(0.0499)**	(0.0067)**	(0.0029)**	(0.0084)**	(0.0062)*
Sales Growth	0.0001	0.0001	0.0003	0.0001	0.0002	0.0002
	(0.0001)	(0.0002)	(0.0003)	(0.0001)	(0.0003)	(0.0002)
Segments Dummy	0.0298	0.0259	-0.0024	-0.0051	-0.0014	-0.0082
	(0.0105)**	(0.0308)	(0.0076)	(0.0767)	(0.0082)	(0.0021)**
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.25	0.19	0.20	0.15	0.22	0.16
Obs.	3671	3671	3671	3671	2778	2778

Panel D: Heckman Selection Specification Comparing Related Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to related acquirers. For Columns (3) and (4), Target includes both vertical and horizontal targets, while for Columns (5) and (6), Vertical Target includes only acquisitions classified as having vertical targets. Level is the investments (capital expenditure/total assets). For the level specifications (Columns (1), (3), and (5)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. Segments Dummy takes the value of one if the firm has 3 or more segments. The inverse mills ratio is from Table 4 Panel B column (1). * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target		Vertical Target	
	Level	Change	Level	Change	Level	Change
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated	0.0033	0.0092	-0.0677	-0.0235	-0.0277	-0.0351
	(0.0098)**	(0.0035)**	(0.0211)**	(0.0082)**	(0.0091)**	(0.0126)**
Segment						
Target Cashflow	0.0978	0.0402	0.0702	0.0141	0.0702	0.0218
	(0.0182)**	(0.0132)**	(0.0201)**	(0.0047)**	(0.0212)**	(0.0071)**
Acquirer Cashflow	0.1459	0.1659	-0.0236	-0.0083	-0.0236	-0.0163
	(0.0301)**	(0.0582)**	(0.0067)**	(0.0028)**	(0.0088)**	(0.0057)*
Sales Growth	0.0001	0.0001	0.0003	0.0001	0.0002	0.0001
	(0.0002)	(0.0002)	(0.0003)	(0.0001)	(0.0002)	(0.0002)
Segments Dummy	0.0216	0.0309	-0.0026	-0.0076	-0.0016	-0.0076
	(0.0079)**	(0.0207)	(0.0024)	(0.0260)	(0.0057)	(0.0027)**
Inverse Mills	-0.1133	-0.3454	-0.1559	-0.0696	-0.1559	-0.0936
Ratio	(0.2301)	(0.1766)	(0.1673)	(0.1761)	(0.0767)*	(0.0467)*
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.24	0.20	0.21	0.16	0.22	0.16
Obs.	3671	3671	3671	3671	2778	2778

Table 8: Post Acquisition Segment Investment-Cashflow Relations

Panel A: Comparing Matched Non-Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to non-acquirers. We examine the level and change in investments (capital expenditure/total assets) for target and acquirer segments. For the level specifications (Columns (1) and (3)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. Seg stands for segments. For this specification, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target	
	Level	Change	Level	Change
	(1)	(2)	(3)	(4)
Unrelated*	0.0645	0.0617	-0.0794	-0.0216
Target Seg Cashflow	(0.0178)**	(0.0229)**	(0.0267)**	(0.0082)**
Unrelated*	0.0018	0.0058	-0.4127	-0.3326
Acquirer Seg Cashflow	(0.0004)**	(0.0021)**	(0.1307)**	(0.0746)*
Unrelated	0.0114	0.2195	-0.0018	-0.0094
	(0.0124)	(0.2019)	(0.0101)	(0.0097)
Segment				
Target Cashflow	-0.0246	-0.0896	0.1220	0.0861
	(0.0966)	(0.0794)	(0.4318)**	(0.0265)**
Acquirer Cashflow	0.0362	0.0819	-0.0059	-0.0063
	(0.0116)**	(0.0257)**	(0.0605)	(0.0583)
Sales Growth	0.0002	0.0052	0.0001	0.0001
	(0.0003)	(0.0033)	(0.0002)	(0.002)
Segments Dummy	0.1504	0.2393	0.0208	0.0114
	(0.2679)	(0.2016)	(0.0274)	(0.0264)
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.29	0.19	0.24	0.18
Obs.	4028	4028	4028	4028

Panel B: Heckman Selection Specification Comparing Matched Non-Acquirers as Control Firms

This panel matches unrelated acquirers to non-acquirers. We examine the level and change in investments (capital expenditure/total assets) for target and acquirer segments. For the level specifications (Columns (1) and (3)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. Seg stands for segments. The inverse mills ratio is from Table 4 Panel B column (1). For this specification, we omit bid characteristics as controls as the non-acquirers have no bid characteristics. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target	
	Level	Change	Level	Change
	(1)	(2)	(3)	(4)
Unrelated*	0.0566	0.0494	-0.0808	-0.0237
Target Seg Cashflow	(0.0209)**	(0.0190)**	(0.0311)**	(0.0089)**
Unrelated*	0.0017	0.0056	-0.3778	-0.3301
Acquirer Seg Cashflow	(0.0004)**	(0.0018)**	(0.1242)**	(0.1179**
Unrelated	0.0093	0.2443	-0.0015	-0.0089
	(0.0145)	(0.2038)	(0.0018)	(0.0177)
Segment				
Target Cashflow	-0.0237	-0.0864	0.1289	0.0865
	(0.1160)	(0.808)	(0.0430)**	(0.0267)**
Acquirer Cashflow	0.0314	0.0849	0.0049	0.0062
	(0.0098)**	(0.0282)**	(0.0061)	(0.0582)
Sales Growth	0.0002	0.0051	0.0001	0.0001
	(0.0004)	(0.0033)	(0.0002)	(0.002)
Segments Dummy	0.1504	0.2392	0.0192	0.0117
	(0.2686)	(0.2017)	(0.0273)	(0.0266)
Inverse Mills Ratio	-0.3468	-0.8292	-0.8737	-0.0674
	(0.3451)	(0.8681)	(0.2437)	(0.2369)
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.29	0.20	0.25	0.19
Obs.	4028	4028	4028	4028

Panel C: Comparing Related Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to related acquirers. For Columns (3) and (4), Target includes both vertical and horizontal targets, while for Columns (5) and (6), Vertical Target includes only acquisitions classified as having vertical targets. Level is the investments (capital expenditure/total assets). For the level specifications (Columns (1), (3), and (5)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. Seg stands for segments. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target		Vertical Target	
	Level	Change	Level	Change	Level	Change
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated*	0.1825	0.3358	-0.0904	-0.0412	-0.0891	-0.0567
Target Seg Cashflow	(0.0727)*	(0.1194)**	(0.0299)**	(0.0149)**	(0.0317)**	(0.0240)*
Unrelated*	0.1727	0.2572	-0.3948	-0.3138	-0.3495	-0.2869
Acquirer Seg Cashflow	(0.0603)**	(0.0918)**	(0.1235)**	(0.1172)**	(0.1219)**	(0.1071)**
Unrelated	0.0214	0.4186	-0.0595	-0.0080	-0.0491	-0.0202
	(0.0242)	(0.2022)*	(0.0171)**	(0.0165)	(0.0161)**	(0.0256)
Segment						
Target Cashflow	-0.0177	-0.0475	0.0069	0.0035	0.0029	0.0023
	(0.0971)	(0.8105)	(0.0024)**	(0.0011)**	(0.0008)**	(0.0007)**
Acquirer Cashflow	0.0234	0.0675	-0.1271	-0.0882	-0.1198	-0.1062
	(0.0085)**	(0.0239)**	(0.1303)	(0.1267)	(0.1237)	(0.1224)
Sales Growth	0.0001	0.0046	0.0001	0.0001	0.0001	0.0002
	(0.0004)	(0.0034)	(0.0002)	(0.0002)	(0.0002)	(0.0004)
Segments Dummy	0.1278	0.7786	0.0285	0.0128	0.0278	0.0139
	(0.2672)	(0.2281)**	(0.0273)	(0.0265)	(0.0258)	(0.0282)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.27	0.20	0.23	0.17	0.24	0.18
Obs.	3671	3671	3671	3671	2778	2778

Panel D: Heckman Selection Specification Comparing Related Acquirers and Unrelated Acquirers

This panel matches unrelated acquirers to related acquirers. For Columns (3) and (4), Target includes both vertical and horizontal targets, while for Columns (5) and (6), Vertical Target includes only acquisitions classified as having vertical targets. Level is the investments (capital expenditure/total assets). For the level specifications (Columns (1), (3), and (5)), we use post-acquisition values for investment. For the change specifications, we take the difference between the post-merger and pre-merger values of the segments. The second stage uses the fitted value of *Unrelated* from the first stage. Seg stands for segments. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Acquirer		Target		Vertical Target	
	Level	Change	Level	Change	Level	Change
	(1)	(2)	(3)	(4)	(5)	(6)
Unrelated*	0.1654	0.2968	-0.1090	-0.0327	-0.0968	-0.0552
Target Seg Cashflow	(0.0628)**	(0.1011)**	(0.0408)**	(0.0124)**	(0.0309)**	(0.0241)*
Unrelated*	0.1878	0.2842	-0.3775	-0.3301	-0.3781	-0.2013
Acquirer Seg Cashflow	(0.0709)**	(0.0923)**	(0.1242)**	(0.1179)**	(0.1187)**	(0.0723)**
Unrelated	0.0204	0.2792	-0.0756	-0.0071	-0.0475	-0.0382
	(0.0328)	(0.2726)	(0.0244)**	(0.0237)	(0.0230)*	(0.0346)
Segment						
Target Cashflow	-0.0215	-0.0418	0.0063	0.0032	0.0024	0.0028
	(0.0873)	(0.8088)	(0.0023)**	(0.0012)**	(0.0009)**	(0.0010)**
Acquirer Cashflow	0.0239	0.0685	-0.1289	-0.0865	-0.1216	-0.1074
	(0.0090)**	(0.0248)**	(0.1304)	(0.1267)	(0.1231)	(0.1228)
Sales Growth	0.0002	0.0051	0.0002	0.0003	0.0002	0.0002
	(0.0004)	(0.0033)	(0.0002)	(0.0002)	(0.0002)	(0.0004)
Segments Dummy	0.1511	0.7786	0.0292	0.0121	0.0286	0.0162
	(0.2686)	(0.2269)**	(0.0273)	(0.0266)	(0.0227)	(0.0237)
Inverse Mills Ratio	-0.2051	-0.7106	-0.1775	-0.1659	-0.1683	-0.1965
	(0.2415)	(0.7264)	(0.1811)	(0.1858)	(0.1805)	(0.2550)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.28	0.21	0.24	0.18	0.25	0.19
Obs.	3671	3671	3671	3671	2778	2778

Table 9: Financing the Acquisition Deals

The sample of public acquirers and public targets of unrelated acquisitions is matched to related acquirers with public targets and public acquirers on size, industry and year. Percentage Stock Deal is the fraction of payment made to the target that is through the acquirer's stock. Percentage Cash Deal is the percentage of payment made to the target that is made in cash. Percentage Other Deal is the percentage of payment made to the target that is neither cash nor stock. If a value is not provided by SDC, then that number is set to zero if SDC reports that any of the other two variables is 100%. If a variable is not reported by SDC, but SDC reports the values of the other two variables, then the missing variable is set equal to 100% less the sum of the other two variables. The remaining Percentage Cash Deal values are set equal to zero if SDC reports the value for Percentage Stock Deal. In Panel B, Stock dummy is a variable that takes the value of one if the target is paid only with the acquirer's stock. % Stock used is the % of the deal paid by the acquirer's stock. Columns 3 and 4 present Heckman two stage regressions with *Unrelated* as the dependent variable in the first stage. The first stage results are reported in Column (1) of Table 4, Panel B. The number of matched observations is 2014. Robust standard errors are in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Panel A: Summary Statistics

Financing	Unrelated (1)	Related (2)	(1) –(2) (3)
Percentage Stock Deal	44.87%	42.98%	1.89%*
Percentage Cash Deal	42.58%	43.13%	-0.55%
Percentage Other Deal	12.55%	13.89%	
No. of Observations	1007	1007	

Panel B: Paying for Unrelated Acquisitions with Acquirer's Stock

	OLS		Heckman Selection	
	Stock Dummy (1)	% Stock Used (2)	Stock Dummy (3)	% Stock Used (4)
Unrelated	2.6047	0.0244	2.1188	0.0277
	(0.7468)**	(0.0076)**	(0.7996)**	(0.0079)**
Inverse Mills Ratio			20.9218	0.1237
			(2.2736)**	(0.0231)**
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.30	0.21	0.34	0.25

Table 10: Pre-Announcement Investment-Performance and Return on Investment of Matched Related and Unrelated Targets

Unrelated targets are matched to related targets. All variables are the pre-acquisition values for the target firms. * and ** represent statistical significance at the five percent and one percent levels, respectively.

	Sales Growth	Q	ROA	Sales/ Investment	Net Income/ Investment
	(1)	(2)	(3)	(4)	(5)
Unrelated	0.0009	0.1971	0.1351	0.6421	0.0826
	(0.0003)**	(0.0308)**	(0.0476)**	(0.2096)**	(0.0309)**
Investment	-0.0528	-0.0621	-0.0277		
	(0.0434)	(0.0615)	(0.0075)**		
Unrelated * Investment	0.0554	0.0251	0.0416		
	(0.0206)**	(0.0092)**	(0.0141)**		
Size	0.0834	0.0372	0.0914	0.5911	0.0801
	(0.0941)	(0.0578)	(0.0541)	(0.1867)**	(0.0796)
Leverage	-0.2404	-0.6318	-0.1861	0.2136	0.8574
	(0.3953)	(0.1278)**	(0.8743)**	(0.2767)	(0.2563)**
Herfindahl	0.0317	0.0239	0.0542	0.4661	0.2624
	(0.0304)	(0.0169)	(0.0574)	(0.7284)	(0.6378)
Constant	0.7366	0.7895	0.2583	0.7758	0.1187
	(0.2315)**	(0.9392)**	(0.5096)	(0.4723)	(0.7322)
Industry	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.07	0.06	0.09	0.05	0.07
Obs.	3671	3671	3671	3671	3671

Table 11: Robustness

Panel A: Acquirer Abnormal Returns Sorted on Information Asymmetry

Within each group, the first column reports result for firms that have higher pre-acqusition information asymmetry. The sample is split using the median value of the information asymmetry variables. Abnormal returns are computed using the market model with the equally weighted index. Robust standard errors are reported in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Acquirer 3 Day CAR	Intangibles		Accruals	
	High	Low	High	Low
Unrelated	0.0109	0.0037	0.0112	0.0011
	(0.0039)**	(0.0029)	(0.0036)**	(0.0023)
Acquirer Controls	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes
Adj. R2	0.03	0.03	0.03	0.02
Obs.	979	980	974	974

Panel B: Operating Performance Sorted on Information Asymmetry of Related Acquirers and Unrelated Acquirers

The sample is split based on the different measures of information asymmetry. High information asymmetry observations are used in odd numbered columns while low information asymmetry observations are used in even numbered columns. The dependent variables are the change in one year after to one year before the acquisition Q and ROA ratios. The combined acquirer and target firm is used to calculate the pre-acquisition numbers. Year and industry dummies are included but not reported. Robust standard errors are reported in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Dependent variable	Q				ROA			
Sorted on	Intangibles		Accruals		Intangibles		Accruals	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unrelated	0.1932	0.0001	0.1375	0.0454	0.3536	0.0006	0.4109	0.0702
	(0.0654)**	(0.0016)	(0.0490)**	(0.0856)	(0.1155)**	(0.1381)	(0.1483)**	(0.1179)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.14	0.12	0.13	0.13	0.15	0.13	0.14	0.14
Obs.	979	980	974	974	979	980	974	974

Panel C: Investments of Related Acquirers and Unrelated Acquirers

This panel splits the sample using the pre-acquisition information asymmetry variables of the acquirer. We examine the post-acquisition level of investment (capital expenditure/total assets) for target and acquirer segments. Robust standard errors are reported in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Dependent variable	Acquirer Investments				Target Investments			
Sorted on	Intangibles		Accruals		Intangibles		Accruals	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unrelated	0.0139	0.0009	0.0061	0.0024	-0.0221	-0.0057	-0.0208	-0.0064
	(0.0049)**	(0.0043)	(0.0018)**	(0.0027)	(0.0079)**	(0.0036)	(0.0077)**	(0.0053)
Segment								
Target Cashflow	0.1489	0.0039	0.1246	0.1221	0.2084	0.1712	0.1423	0.0868
	(0.0741)*	(0.0159)	(0.1197)	(0.1316)	(0.1063)**	(0.0601)**	(0.0539)**	(0.0308)**
Acquirer Cashflow	0.1757	0.1328	0.1447	0.1269	-0.0727	-0.0764	-0.0730	-0.1629
	(0.0653)**	(0.0344)**	(0.0476)**	(0.0351)**	(0.0739)	(0.1359)	(0.0832)	(0.2042)
Sales Growth	0.0003	0.0001	0.0001	0.0007	0.0004	0.0008	0.0002	0.0001
	(0.0011)	(0.0002)	(0.0001)	(0.0002)**	(0.0006)	(0.0006)	(0.0006)	(0.0006)
Segments Dummy	0.0342	0.0225	0.0331	0.0304	-0.0033	-0.0022	-0.0012	-0.0015
	(0.0124)**	(0.0186)	(0.0139)*	(0.0158)	(0.0021)	(0.0040)	(0.0042)	(0.0074)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.27	0.25	0.26	0.25	0.21	0.19	0.20	0.19
Obs.	1796	1796	1784	1784	1796	1796	1784	1784

Panel D: Segments' Investment Cash flow Sensitivity

This panel splits the sample at the median value of the pre-acquisition acquirer's intangibles or accruals. Observations with higher values of intangibles and accruals are used in odd numbered columns. We examine the post-acquisition level of investment (capital expenditure/total assets) for target and acquirer segments. Robust standard errors are reported in parentheses. * and ** represent statistical significance at the five percent and one percent levels, respectively.

Dependent variable	Acquirer Investments				Target Investments			
Sorted on	Intangibles		Accruals		Intangibles		Accruals	
	High	Low	High	Low	High	Low	High	Low
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Unrel*Target Seg CF	0.2633	0.1598	0.2186	0.0171	-0.1317	-0.0147	-0.1327	-0.0301
	(0.0952)**	(0.1270)	(0.0515)**	(0.0483)	(0.04833)**	(0.0454)	(0.0482)**	(0.0368)
Unrel*Acq Seg CF	0.2641	0.1460	0.2541	0.1728	-0.3728	-0.0045	-0.2759	-0.1248
	(0.1035)**	(0.1943)	(0.0942)**	(0.1065)	(0.1365)**	(0.0052)	(0.0984)**	(0.1479)
Unrelated	0.0578	0.0027	0.0255	0.0551	-0.0551	-0.0109	-0.0083	-0.0032
	(0.1045)	(0.0031)	(0.0189)	(0.0918)	(0.0356)	(0.0024)**	(0.0196)	(0.0026)
Segment								
Target Cashflow	-0.0148	-0.0738	-0.0189	-0.0513	0.0513	0.0427	0.0519	0.0468
	(0.0799)	(0.1084)	(0.0117)	(0.0823)	(0.0193)**	(0.0164)**	(0.0164)**	(0.0136)**
Acquirer Cashflow	0.1231	0.1634	0.1588	0.1854	-0.0854	-0.0149	-0.0476	-0.0149
	(0.0454)**	(0.0623)**	(0.0563)**	(0.0654)**	(0.2255)	(0.0134)	(0.0242)*	(0.0259)
Sales Growth	0.0006	0.0009	0.0004	0.0007	0.0007	0.0007	0.0002	0.0007
	(0.0008)	(0.0006)	(0.0007)	(0.0006)	(0.0006)	(0.0002)**	(0.0002)	(0.0002)**
Segments Dummy	0.0012	0.0018	0.0026	0.0017	0.0015	0.0225	0.0317	0.0242
	(0.0026)	(0.0047)	(0.0046)	(0.0078)	(0.0077)	(0.0186)	(0.0147)*	(0.0173)
Acquirer Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer Industry Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bid Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adj. R2	0.30	0.28	0.29	0.28	0.25	0.24	0.24	0.24
Obs.	1796	1796	1784	1784	1796	1796	1784	1784

Appendix A: Variable Definitions

Variable Name	Description and Source
Acquirer CAR	Acquirer cumulative abnormal announcement return. We use the market model and the equally weighted stock index to estimate the parameters for 20 to 210 trading days prior to the announcement. Source: CRSP
Bid-Ask Spread	Median of monthly bid ask spreads divided by price over the calendar year. Source: CRSP
Bidders	Number of bidders for the target. Source: SDC
Cash Deal	Acquisitions that are 100% paid with cash. Source: SDC
Cash holding	Cash and short term investments divided by total assets. Source: Compustat
Cashflows	Operating income before depreciation (OIBD) divided by total assets. Source: Compustat.
Degree	Number of supplier or customer relations one industry has with another. This relationship is weighted by the dollar amount of such relationships. Source: Bureau of Economic Analysis
Discretionary Accruals	Modified Jones method. Source: Compustat
Herfindahl	The sum of the squares of the market shares of each firm in an industry. The market share is firm sales divided by industry sales. Source: Compustat
Hi–tech	Dummy variable that takes the value of one if the target is classified to be in a high technology industry. Source: SDC
Horizontal	Any merger in which the Hoberg-Phillips industry of the acquirer and the target is classified as the same. Source: SDC
Hostile	Dummy variable that takes the value of one if the acquirer makes a bid that is deemed to be hostile by the target. Source: SDC
Implied Cost of Capital	Implied cost of capital is the internal rate of return that makes the price of the stock equal to its future expected cashflows. The methodology is that of Chava and Purnanandam (2010).
Intangibles	Intangible assets less goodwill divided by total assets. Source: Compustat
Investment	Capital expenditures divided by total assets. Source: Compustat
Leverage	Total liabilities divided by total assets. Source: Compustat

Neutral	Dummy variable that takes the value of one if the target does not take the acquisition bid to be hostile or friendly. Source; SDC
Non Acquirers	Firm- years in which a firm makes no acquisitions. Source: SDC
Q	Numerator consists of the sum of market value of equity (CSHO*PRCC_F), DLTT, preferred stock liquidation value (PSTKL), less deferred taxes (TXDB) and investment tax credit (ITCB). Denominator is total assets. Source: Compustat
Rating	Dummy variable that takes the value of one if the firm's debt is rated. Source: Compustat
Relative Size	The ratio of the size of the target and acquirer. Source: Compustat
ROA	One year after the acquisition net income divided by the total assets of the combined firm one year prior to the acquisition. Source: Compustat
(Sale-COGS)/Sale	The one year after the acqusition ratio of Sales-COGS divided by Sales. Source: Compustat
Sales Growth	Growth in sales from one year before to one year after the acqusition of the combined firm. Source: Compustat
Sale/lag(Assets)	One year after the acquisition sales divided by the total assets of the combined acquirer and target one year before the acquisition. Source: Compustat
Segments Dummy	Dummy variable that takes the value of one if the firm has three or more segments. Source: Compustat
Size	Log of Total Assets. Source: Compustat
Stock Deal	Acquisitions that are 100% paid with the acquirer's stock. Source: SDC
Stock Dummy	Dummy variable that equals one if the acquirer issues stock to finance the acquisition. Source: SDC
Tender Offer	Dummy variable that takes the value of one if the method for acquiring the target is a tender offer. Source: SDC
Toehold	Dummy variable that equals one if the acquirer owns more than five percent of target's stock before the announcement of the acquisition. Source: SDC
Unrelated	Any merger that is neither horizontal nor vertical.
Vertical	Any merger in which the vertical relationship between acquirer and target is greater than *one* percent. Vertical relationship is the customer –supplier relationship between industries. Source: Benchmark Input-Output tables from Bureau of Economic Analysis