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Target Firm-Specific Information and Acquisition Efficiency

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Abstract. This study investigates whether firm-specific information about targets improves acquisition efficiency. We define acquisition efficiency as the total surplus generated by an acquisition and measure it as the difference in the value of the merged firm and the sum of the two firms operating separately. We find a positive association between target firm-specific information and acquisition efficiency that is driven mainly by diversifying acquisitions. Additional evidence suggests that both the likelihood of the withdrawal of an announced acquisition and the likelihood of a future divestiture of a target decrease with target firm-specific information. Taken together, our findings suggest that the availability of this information improves merger and acquisitions efficiency.

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Keywords: mergers and acquisitions • efficiency • firm-specific information • common value • private value

1. Introduction

Mergers and acquisitions (M&A), transactions in which a firm acquires control of another entity, are significant corporate events with financial implications for shareholders, executives, employees, and the economy. Not surprisingly, academic research has devoted significant attention to studying M&A. A recently evolving line of research investigates the effect of target information quality on the process of deal making. Marquardt and Zur (2015) and Cain et al. (2014), for example, provide evidence that low target accounting quality increases the likelihood that an acquisition will be structured as an auction rather than as a negotiated deal. This evidence is consistent with the view that, when compared to negotiated deals, auctions reduce adverse selection risk. The quality of target accounting information has also been shown to contribute to acquirers' shareholder wealth (McNichols and Stubben 2015) and to detract from targets' shareholder wealth (McNichols and Stubben 2015, Raman et al. 2013, Skaife and Wangerin 2013).[1]

Rather than focusing on the economic effect of target information quality on the target's or acquirer's shareholders as in prior literature, we draw from economic theory on auctions and analyze whether this information affects the overall economic efficiency of merging two firms, defined as the total surplus generated by an acquisition (Vickrey 1961, Milgrom 1989).[2] Economic theory distinguishes between common value auctions and private value auctions. In a common value auction, the value of the auctioned item is the same for all bidders, but the bidders are uncertain what that value is. In a private value auction, the auctioned item has a different value for each bidder, who knows that private value with certainty. That private value, however, is not known to other bidders. The outcome that results in the largest economic surplus is for the bidder with the highest private value to purchase the auctioned item.

Researchers generally incorporate both private value and public value in their models (Milgrom and Weber 1982; Klemperer 1999; Goeree and Offerman 2002, 2003), because pure auctions of either sort are rare in practice. Goeree and Offerman (2002, 2003) show that, when auctions consist of both common value and private value elements, the availability of information on the auctioned item that reduces uncertainty about its common value leads bidders to rely more on private values. This, in turn, results in a higher likelihood that the bidder with the highest private value will win the bid and in an increased economic efficiency.

We follow this theory and predict that the availability of target information reduces bidders' uncertainty about the target's common value, thus increasing the precision of the common value estimation. That leads bidders to rely more on their private values, which include synergistic gains, which in turn results in greater acquisition efficiency. This prediction on the relation between target firm-specific information and acquisition efficiency likely holds also for negotiated deals.[3] To test this prediction, we measure acquisition efficiency as the weighted average abnormal returns of the acquirer and the target around an acquisition announcement. To gauge target information quality, we follow the literature using a market-based proxy to measure firm-specific information (e.g., Wurgler 2000;

Durnev et al. 2003, 2004; DeFond and Hung 2004; Jin and Myers 2006). Specifically, we calculate the extent to which target-firm stock-price movements are uncorrelated with the overall market and the respective industry over the three years before acquisitions (stock-return nonsynchronicity). This market-based measure has the advantage that stock price likely incorporates all the value-relevant, firm-specific information—public and private—available about the target. Based on these empirical measures, we document a positive association between target firm-specific information and efficiency of corporate takeovers.

We conduct additional tests to rule out alternative explanations. One possible explanation is that both our explanatory and dependent variables (stock-return nonsynchronicity and the combined announcement returns) are market-based measures and, consequently, spurious correlations might drive our results. In addition, some disagreement exists among academics with respect to whether nonsynchronicity (the explanatory variable) measures firm-specific information. To address these two issues, we use an alternative, non-market-based measure for the explanatory variable and the dependent variable. Specifically, we substitute weighted average returns as the measure of acquisition efficiency with the change in return on assets (ROA). Expected surplus captured by the combined announcement returns is likely to be, on average, congruent with realized surplus, and a change in ROA gauges the realized surplus (Wang and Xie 2009). We substitute stock-return nonsynchronicity with abnormal accruals, an accounting-based measure widely used as a proxy for transparency and information quality of financial reporting (Bharath et al. 2008, Beatty et al. 2010). Hutton et al. (2009) suggest that variations in accounting quality explain variations in stock-return nonsynchronicity. Our main results are robust to these alternative measures.

Next, we perform a set of additional analyses aimed at corroborating the main tests. First, we examine whether the probability of a target being divested postacquisition decreases with the target's firm-specific information. We predict that, if target information increases the likelihood of the acquirer with the highest private value winning the auction, then that information will reduce the likelihood of divestiture postacquisition. We find evidence consistent with this prediction.

Second, we analyze whether target firm-specific information affects the likelihood of the withdrawal of a bid before the acquisition is completed. The rationale is as follows. The likelihood of the acquirer discovering negative information about the target from the announcement date to the consummation date is expected to decrease with the preacquisition level of target firm-specific information. Discovery of negative information about the target likely causes the acquirer to revise downward its common value estimate and withdraw from the deal. Consistent with the evidence provided by Marquardt and Zur (2015) and Amel-Zadeh and Zhang (2015), we find that the likelihood of a withdrawn deal after an acquisition announcement decreases with target firm-specific information.

Third, we analyze the differential effect of target firm-specific information on acquisition efficiency between within-industry acquisitions and cross-industry acquisitions. Target information is likely to be more important in estimating common value when the target and acquirer come from different industries. In these cases, information asymmetry between the two parties is likely to be greater. We predict and find that the positive association between target stock-return nonsynchronicity and acquisition efficiency is stronger for cross-industry acquisitions than for within-industry acquisitions.

Finally, we conduct a falsification test by replacing target stock-return nonsynchronicity with target earnings nonsynchronicity, which likely captures the extent to which target fundamentals differ from the overall market and industry peers. We do not find any relation between target earnings nonsynchronicity and acquisition efficiency, suggesting that our results are unlikely to reflect the effect of target firm-specific fundamentals on acquisition efficiency.

Our study contributes to two important strands of literature. First, it highlights the social value of information—its effect on the efficiency of allocating resources in the market for corporate control. By providing empirical evidence that target information affects acquisition efficiency, our study provides empirical support for the auction theory of Goeree and Offerman (2003) in an M&A setting. Second, our results extend the literature on the effect of target accounting information on the deal process (Marquardt and Zur 2015, Cain et al. 2014, Skaife and Wangerin 2013) as well as on acquirer and target shareholder value separately (McNichols and Stubben 2015, Raman et al. 2013). Whereas the literature has documented the effect of accounting quality on deal formation and wealth transfer from target shareholders to acquirer shareholders, our study illuminates the effect of target information on the overall size of the pie.[4] An immediate implication is that improving firm financial reporting quality might enhance such efficiency as discussed in Bushman and Smith (2001). From a social planner point of view, regulations that aim to promote firm transparency are likely to result in improved efficiency in the M&A market.

The remainder of this paper proceeds as follows. Section 2 reviews related literature and develops a testable hypothesis. Section 3 discusses research methodology. Section 4 describes sample selection. Section 5 presents

the empirical results of analyzing the relation between target firm-specific information and acquisition efficiency. Section 6 provides further discussion and analysis. Section 7 concludes.

2. Literature Review and Hypothesis Development

2.1. Mergers and Acquisitions

M&A represent massive reallocations of economic resources, both within and across industries. Based on a sample of 12,023 acquisitions with purchase prices of more than $1 million from 1980 to 2001, Moeller et al. (2005) document that their sample firms spent roughly $3.4 trillion dollars (in 2001 dollars) on acquisitions. Investments of this magnitude tend to intensify conflicts of interest between managers and shareholders, and researchers thus have investigated the causes and effects of M&A extensively (e.g., Berle and Means 1933, Jensen and Meckling 1976, among others).

One key aspect that has been understudied is the role that information plays in acquisitions. Burgeoning research attempts to fill this void. One line of work focuses on the relation between the quality of financial information provided by a target and the profits to shareholders of the merging parties. McNichols and Stubben (2015) examine the relation between target-firm accounting quality and acquirer (target) profit from an acquisition. They document a positive (negative) relation between these two components, suggesting that acquiring-firm shareholders benefit while target-firm shareholders fare worse when target-firm accounting quality is high. Raman et al. (2013) find consistent results with regards to target profit in a setting of negotiated deals. Consistent with the above findings, Skaife and Wangerin (2013) show that low-quality financial reporting grants target shareholders higher premiums in acquisitions. This premium, however, comes at the cost of an increased probability of renegotiation or withdrawal following due diligence.

A second strand of research focuses on the effect of target financial-reporting quality on acquisitions. Marquardt and Zur (2015) argue and find that high-quality accounting information reduces the costs of negotiation and predict that target accounting quality is negatively (positively) associated with the likelihood of an auction (negotiation). Consistent with the findings of Marquardt and Zur (2015), Cain et al. (2014) provide evidence that a negotiated deal is likely to be initiated by the target when adverse-selection risk is high whereas the acquirer is likely to initiate a negotiated deal when adverse-selection risk is low. Overall, recent research suggests that target-firm accounting quality affects deal structures in mitigating adverse-selection risk and influences shareholder values for both the target and the acquirer. As far as we know, no study has examined the role that information plays in the overall efficiency (economic surplus created from combining two firms) of the takeover market.

2.2. Hypothesis Development

An auction simultaneously transfers control of an asset and determines the price of the transaction (Dasgupta and Hansen 2006). In corporate finance, acquisitions are frequently conducted through auctions. Boone and Mulherin (2007) document that over 50% of acquisitions involve auctions. Therefore, we motivate our hypothesis based on auction theory.[5] As discussed above, economic theory generally considers two types of auctions: common value and private value. Goeree and Offerman (2002, 2003) demonstrate that, when auctions consist of both common value and private value elements, uncertainty about the common value can hurt the bid outcome in an economic allocation sense. The intuition provided is as follows:

> A bidder with a moderate private value and an overly optimistic estimate of the common value may outbid a rival with a superior private value but more realistic conjectures about the common value. In the limit when the uncertainty about the common value is so large that it may override the private value information, auctions are no more efficient than a random allocation rule. In the other extreme when there is no uncertainty about the common value at all, the auction reduces to an efficient private value auction.
>
> (Goeree and Offerman 2003, p. 599)

The authors further postulate that the availability of information about the common value reduces uncertainty and increases the probability that the bidder with the highest private value will win the bid, increasing efficiency. Following their theory, we argue that the availability of target information likely reduces bidders' uncertainty about the target's common value. This leads bidders to rely more on private values such as synergistic gains and results in greater efficiency. Our hypothesis is formally stated as follows:

Hypothesis. *Acquisition efficiency is positively associated with the availability of the preacquisition firm-specific information about the target.*

As noted by Goeree and Offerman (2003), the proposition regarding efficiency holds for all standard auctions such as first-price, second-price, and English auctions. Our prediction thus generalizes to all acquisitions conducted through auctions. It likely holds for negotiated deals as well. The rationale is as follows. Cain et al. (2014) provide evidence that acquirers tend to initiate acquisitions of relatively transparent targets, and targets tend to initiate acquisitions when they are relatively opaque. Both acquirer-initiated acquisitions and target-initiated acquisitions may ultimately be executed as an auction or as a negotiated deal. The choice

of whether to use an auction or negotiation (or to proceed with the negotiation in the case of acquirer-initiated acquisition) lies with the target, which decides based on the trade-off between the benefits from an auction and the costs of revealing proprietary information to multiple firms during that auction (Boone and Mulherin 2007).

Thus, in negotiated deals that were initiated by the acquirer, targets are more transparent (Cain et al. 2014). The acquirer can then estimate the common value with less uncertainty. That is likely to lead to more reliance on the private value and thus to an efficient outcome: an acquirer with the highest private value approaches a transparent target. When the (relatively opaque) target approaches the acquirer, the efficiency of such a transaction hinges on the target's ability to identify the acquirer with the highest private value of the target. On average, however, the efficiency of such a transaction is likely to be lower than that of an acquirer-initiated negotiated deal. This is because the acquirer knows with certainty its true private value of the target and can estimate with precision the public value of the (relatively transparent) target in the latter case. Therefore, this is consistent with a positive association between firm-specific information about the target and acquisition efficiency.

3. Research Methodology

3.1. Measure of Acquisition Efficiency

We measure acquisition efficiency—the total surplus from an acquisition—by the combined announcement returns of both the acquirer and the target based on the assumption that announcement return for each captures the individual expected surplus. Specifically, for each acquisition, we form a value-weighted portfolio of the acquirer and the target returns, with weights based on their respective market values measured on the date when we start cumulating returns before an acquisition announcement. For the acquirer, the return cumulating window is $(-1, +1)$ days around the announcement day. For the target, the return cumulating window is $(-20, +1)$ days around the acquisition announcement day because some information about the acquisition likely leaks to the market before the actual announcement and the target's stock may experience a run-up in the period leading to the acquisition announcement.[6] The portfolio's abnormal return is measured by market-model prediction errors, where market-model parameter estimates are obtained for each target and acquirer firm using a maximum of 240 trading days of daily returns data beginning 300 days before the acquisition announcement date. We obtain the announcement dates from the Securities Data Corporation's (SDC) U.S. Mergers and Acquisitions database, and use the CRSP value-weighted return as the market return. The cumulative abnormal returns around the announcement for the target and the acquirer are separately calculated.[7]

Prior research has found that acquisitions tend to cluster by industry (Mitchell and Mulherin 1996) and returns generally vary with firm size and book-to-market ratio (Fama and French 1993). To account for these factors, we follow Oler (2008) who estimates abnormal returns measure using a portfolio of four peer firms matched based on industry, market capitalization, and book-to-market ratio and construct an alternative measure of combined returns. To form the portfolio of peer firms, we group all potential matches into five book-to-market portfolios (BTM portfolios) by industry. We then pick the four matches from the same industry/BTM portfolios for each test firm (acquirer or target) by their closeness to the test firm's market capitalization.[8]

Because both the explanatory variable (the stock-return nonsynchronicity discussed in detail in §3.2) and the dependent variable (combined announcement returns) are measured using stock returns, spurious correlations may explain our results. To address this concern, we use the change in long-term operating performance (ROA) around the acquisition year to serve as an alternative measure of acquisition efficiency for the combined returns. Change in ROA is a natural choice for an alternative measure because expected surplus is, on average, congruent to realized surplus and a change in ROA gauges realized surplus (Wang and Xie 2009).[9] Specifically, we measure the percentage change in ROA from year $t-1$ to year $t+1$, where year t is the acquisition announcement year. ROA in year $t-1$ is computed as the value-weighted ROA for the acquirer and the target with the weights as their corresponding preacquisition total assets. ROA in year $t+1$ is measured for the merged entity. ROA_{t-1} is the operating income before depreciation in year $t-1$ deflated by total assets averaged over years $t-2$ and $t-1$. We expect a positive association between target firm-specific information and the change in operating performance of the combined entity.

3.2. Measure of Firm-Specific Information

Following Piotroski and Roulstone (2004), the main measure we use to capture firm-specific information is stock-return nonsynchronicity, computed as the minus sign of the following term: $\log(R^2/(1-R^2))$. R^2 used to compute nonsynchronicity is estimated annually based on the following regression:

$$RET_{i,t} = \beta_0 + \beta_1 MARET_{i,t-1} + \beta_2 MARET_{i,t} + \beta_3 INDRET_{i,t-1} + \beta_4 INDRET_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where $MARET_{i,t-1}$ and $MARET_{i,t}$ are the value-weighted weekly market return for weeks t and $t-1$, respectively, and $INDRET_{i,t-1}$ and $INDRET_{i,t}$ are the

weekly industry (two-digit Standard Industrial Classification (SIC)) return for weeks t and $t-1$, respectively, with firm i's return omitted. The firm-specific annual R^2 measures how much the variation of firms' annual stock returns can be explained by variation of market- and industry-level returns. The higher the R^2 (lower nonsynchronicity), the more the firm's stock comoves with the market and the industry, and therefore the less firm-specific information is impounded in stock price. Hence firm-specific information decreases in R^2.

Bushman and Smith (2001) note that, in an efficient stock market, prices reflect all information, public and private, that investors possess about firms' prospects.[10] Thus, stock price movements can gauge the availability of a firm's specific information to market participants. If a firm's stock price movement is highly correlated with the movement of market, with other stocks in the same industry, or with both (nonsynchronicity is low), this implies that changes in the information set about the firm are driven by industry- or market-wide changes and thus less by firm-specific news. Wurgler (2000) provides country-level evidence that firm-specific information impounded in stock prices, measured by stock-return nonsynchronicity, improves investment efficiency. DeFond and Hung (2004) document that the association between lagged stock returns and subsequent CEO turnover is stronger in countries where stock returns exhibit higher nonsynchronicity. Morck et al. (2000) find higher stock-return nonsynchronicity in countries with better protection for the property rights of outside investors. They interpret this result as suggesting that, in countries with less corruption and better shareholder protection, traders have more incentive to trade based on firm-specific information. Jin and Myers (2006) find that stock-return nonsynchronicity is negatively correlated with various country-level measures of opacity, such as auditing and accounting standards.

Furthermore, Durnev et al. (2004) show that firms in industries with higher stock-return nonsynchronicity allocate capital more efficiently in the sense that their marginal Tobin's Q ratios are closer to one than those of firms in industries with low stock-return nonsynchronicity. Their results suggest that firm-specific information impounded in stock price can also serve corporate governance mechanisms to enhance investment efficiency. Based on a positive association between stock-return nonsynchronicity and the relation of contemporaneous stock returns with future earnings, Durnev et al. (2003) conclude that stock-return nonsynchronicity likely gauges the extent to which firm-specific information is promptly and accurately reflected in stock price. Work by Gul et al. (2010) investigates Chinese firms and shows that nonsynchronicity is lower when a firm's largest shareholder is government related but higher when a firm has higher foreign ownership and higher auditor quality. In addition, they show that the amount of earnings information reflected in stock returns is higher for firms with high nonsynchronicity. In sum, the literature suggests that stock-return nonsynchronicity captures the richness of firm-specific information available to market participants over and above the market and industry information.

Other studies, while not directly contradicting the interpretation of nonsynchronicity as a measure of firm-specific information, do suggest alternative interpretations. West (1988) argues that low R^2 reflects more noise in returns. Barberis et al. (2005) show that a firm's simple addition or deletion from the S&P 500 index, perceived to be a noninformation event, can significantly change the R^2. Furthermore, Rajgopal and Venkatachalam (2011) find a temporal increase in U.S. firms' stock-return volatility accompanied by declining earnings quality. Some researchers use stock-return nonsynchronicity as a measure of information asymmetry (e.g., Moeller et al. 2007) where high nonsynchronicity corresponds to high information asymmetries.

Note that these researchers use either simple stock-return volatility or the R^2 of the market model to compute nonsynchronicity.[11] None of them use a model that includes industry returns as part of the explanatory variables in the same way that is commonly constructed in the literature linking nonsynchronicity with information and economic outcome. Furthermore, Piotroski and Roulstone (2004) show that analyst coverage—intuitively thought of as increasing firm-specific component information—is actually more strongly associated with industry-level information. Therefore, in our setting, in which we seek to capture target firm-specific information over and above industry-level information, it is important to separate industry-level returns from firm-specific returns when measuring nonsynchronicity.

To corroborate the results based on stock-return nonsynchronicity, we perform additional analyses using abnormal (discretionary) accruals as an alternative measure for target preacquisition levels of firm-specific information. Abnormal accruals are widely used in the literature as a proxy for financial reports' informativeness. Financial reporting is an important source of public information that firms disclose to investors (Healy and Palepu 2001), which, together with private information and public information disclosed through other channels (e.g., conference calls and press releases), constitutes a firm's entire information set.

Prior research provides evidence that the information quality of financial reports reduces borrowing costs and affects debt-contract terms (Bharath et al. 2008), firms' financing choices (Beatty et al. 2010), and the process of M&A deal making (Marquardt and

Zur 2015). Hutton et al. (2009) provide evidence on a negative association between financial reporting quality (measured by abnormal accruals) and firm-specific information measured by stock-return nonsynchronicity. Shalev (2009) suggests that firms with higher levels of abnormal accruals tend to disclose less about an acquisition after its consummation. Therefore, we use abnormal accruals to measure the level of firm-specific information from financial reports. We follow Dechow et al. (1995) and Hutton et al. (2009) and measure abnormal accruals from the modified Jones (1991) model as follows:

$$\begin{aligned} &ABN\_ACCRUALS_{i,t} \\ &\quad = TOT\_ACCRUALS_{i,t} \\ &\qquad - \left[\hat{\alpha}_0 \frac{1}{ASSETS_{i,t-1}}\right. \\ &\qquad\quad \left. + \hat{\beta}_1 \frac{\Delta SALES_{i,t} - \Delta AR_{i,t}}{ASSETS_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i,t}}{ASSETS_{i,t-1}}\right], \end{aligned} \quad (2)$$

where $ABN\_ACCRUALS_{i,t}$ denotes abnormal accruals for firm i in year t; $TOT\_ACCRUALS_{i,t}$ denotes total accruals for firm i at the end of year t; $\Delta SALES_{i,t}$ denotes changes in firm i's sales in year t; $\Delta AR_{i,t}$ denotes changes in firm i's accounts receivable in year t; $PPE_{i,t}$ denotes firm i's property, plant, and equipment at the end of year t; and $ASSETS_{i,t-1}$ denotes firm i's total assets at the end of year $t-1$. We estimate $\hat{\alpha}_0$, $\hat{\beta}_1$, and $\hat{\beta}_2$ from the following regression:

$$\begin{aligned} &\frac{TOT\_ACCRUALS_{i,t}}{ASSETS_{i,t-1}} \\ &\quad = \alpha_0 \frac{1}{ASSETS_{i,t-1}} + \beta_1 \frac{\Delta SALES_{i,t}}{ASSETS_{i,t-1}} \\ &\qquad + \beta_2 \frac{PPE_{i,t}}{ASSETS_{i,t-1}} + \varepsilon_{i,t}. \end{aligned} \quad (3)$$

3.3. Model Specification and Variable Definitions

The baseline equation for testing our predictions is as follows:

$$\begin{aligned} &EFFICIENCY_i \\ &\quad = \beta_0 + \beta_1 FS\_INFO_i + \beta_2 ACQ_{\text{controls}} \\ &\qquad + \beta_3 TRG_{\text{controls}} + \beta_4 DEAL_{\text{controls}} + \varepsilon_i, \end{aligned} \quad (4)$$

where $EFFICIENCY_i$ is acquisition efficiency, measured alternatively by the value-weighted combined abnormal returns of both the acquirer and the target around the acquisition announcement (*COMB_RET*) or by the change in the merged companies' return on assets (ΔROA); and FS_INFO_i is measured alternatively by the negative of the natural logarithm transformation of the annual firm-specific R^2 obtained from estimating Equation (1) ($NONSYNCH_i$)[12] or by the target's level of preacquisition abnormal accruals ($ABN\_ACCRUALS_i$).

We select the control variables based on prior studies (i.e., Myers and Majluf 1984, Bradley et al. 1988, Lang et al. 1991, Moeller et al. 2004, Masulis et al. 2007, Wang and Xie 2009). These control variables are categorized into three groups: acquirer characteristics ($ACQ\_CONTROLS_i$), target characteristics ($TRG\_CONTROLS_i$), and deal characteristics ($DEAL\_CONTROLS_i$). Both $ACQ\_CONTROLS_i$ and $TRG\_CONTROLS_i$, unless specified otherwise, are measured at the end of the fiscal year before the acquisition announcements.

We expect the coefficient β_1 in Equation (4) to be positive when the measure for firm-specific information is nonsynchronicity and negative when the measure is abnormal accruals. Following Petersen (2009), all regressions are estimated with industry fixed effects, and standard errors are clustered at the firm and year. Because both explanatory variables (*NONSYNCH* and *ABN_ACCRUAL*) are estimated from a first-stage regression and may be measured with an error, we use a bootstrap estimation technique where applicable. All p-values are reported based on two-tailed tests unless noted otherwise.

4. Sample Selection and Summary Statistics

The sample construction is illustrated in Table 1, panel A. We obtain initial acquisitions data from the SDC U.S. Mergers and Acquisitions database. Between January 1, 1980, and December 31, 2012, 5,572 acquisition announcements are identified with publicly traded acquirers and targets. The sample period is restricted to start in 1980 because the number of pre-1980 acquisitions recorded in the SDC is very small.

We restrict the sample to acquisitions in which the acquirer purchased 100% of the target for two reasons. First, this restriction eliminates acquisitions in which acquirers had a stake in targets before current acquisition announcements, thereby possibly having access to target firm-specific information. Consequently, the impact of the availability of preacquisition firm-specific information impounded in the target stock price may have little impact on the uncertainty of common value estimation. Second, the 100% restriction ensures that the economic impact of acquisitions is large. This procedure reduces the sample size by 1,491 observations. Furthermore, to eliminate acquisitions in which the acquirer was, in fact, the target but for other purposes (e.g., tax) becomes the acquirer, we restrict the sample to acquisitions in which the deal value is smaller than the acquirer's preacquisition market value. In addition, we exclude thinly traded targets, which are not traded on a daily basis. These firms are expected to exhibit high nonsynchronicity for reasons unrelated to information.

Data requirements for stock price and returns (CRSP), firms' financial data (Compustat), and sufficient data to compute at least one of the two measures

Table 1. Sample Selection and Summary Statistics

Panel A: Sample filter for the main analysis

Acquisitions announcements of public targets	5,572
Percent acquired < 100% or missing	(1,491)
Relative size > 1	(778)
No returns data	(149)
Availability of Compustat, CRSP, and SDC data for control variables	382
No data to compute either nonsynchronicity or abnormal accruals[a]	(212)
Final sample	2,560
—Completed acquisitions	2,209
—Withdrawn acquisitions	351
—Nonsynchronicity subsample	1,883
—Abnormal accruals subsample	1,560

Panel B: Sample distribution by announcement year

Year	Number of acquisitions	Percentage of sample (%)	Mean (median) acquirer market value of equity millions $	Mean (median) deal value millions $	Mean (median) relative size
1980	3	0.12	2,533	249	0.19
			(1,040)	(227)	(0.16)
1981	26	1.01	945	206	0.27
			(806)	(57)	(0.20)
1982	16	0.62	1,062	120	0.23
			(802)	(56)	(0.07)
1983	25	0.98	1,319	147	0.21
			(817)	(108)	(0.16)
1984	31	1.21	1,147	189	0.31
			(482)	(124)	(0.26)
1985	44	1.72	4,820	189	0.32
			(739)	(114)	(0.18)
1986	53	2.07	1,493	228	0.27
			(882)	(96)	(0.18)
1987	56	2.18	2,905	195	0.24
			(1,009)	(91)	(0.14)
1988	68	2.65	2,434	151	0.27
			(648)	(57)	(0.14)
1989	57	2.22	1,978	190	0.23
			(842)	(82)	(0.17)
1990	39	1.52	3,905	140	0.24
			(625)	(50)	(0.24)
1991	54	2.11	1,447	206	0.30
			(643)	(93)	(0.21)
1992	39	1.52	1,680	294	0.25
			(959)	(164)	(0.15)
1993	51	1.99	2,238	218	0.23
			(1,251)	(131)	(0.12)
1994	88	3.43	2,964	213	0.26
			(790)	(107)	(0.17)
1995	141	5.50	2,866	171	0.24
			(780)	(120)	(0.14)
1996	123	4.80	3,646	227	0.26
			(1,223)	(116)	(0.12)
1997	212	8.27	5,742	269	0.26
			(1,107)	(177)	(0.20)
1998	200	7.80	5,608	219	0.23
			(1,251)	(123)	(0.12)
1999	207	8.12	19,000	251	0.19
			(1,975)	(160)	(0.10)

Table 1. (Continued)

Panel B: Sample distribution by announcement year (continued)

Year	Number of acquisitions	Percentage of sample (%)	Mean (median) acquirer market value of equity millions $	Mean (median) deal value millions $	Mean (median) relative size
2000	149	5.81	14,500 (1,567)	261 (173)	0.22 (0.09)
2001	150	5.85	11,600 (1,107)	191 (99)	0.23 (0.13)
2002	94	3.67	9,348 (1,094)	195 (105)	0.19 (0.09)
2003	91	3.55	6,509 (910)	222 (129)	0.24 (0.14)
2004	93	3.63	5,302 (1,692)	261 (170)	0.23 (0.13)
2005	78	3.04	12,400 (1,195)	275 (202)	0.27 (0.12)
2006	69	2.69	14,200 (2,303)	312 (266)	0.17 (0.11)
2007	82	3.20	11,600 (2,112)	361 (294)	0.25 (0.13)
2008	53	2.07	11,700 (755)	192 (117)	0.21 (0.10)
2009	42	1.64	14,000 (814)	280 (128)	0.21 (0.14)
2010	54	2.11	17,300 (1,908)	322 (275)	0.19 (0.11)
2011	25	0.98	7,300 (1,503)	270 (258)	0.21 (0.10)
2012	47	1.83	19,500 (948)	191 172	0.24 (0.19)
Total	2,560	100	8,054 (1,093)	232 (136)	0.24 (0.14)

Panel C: Acquirer and target industry distribution

One-digit Department of Labor industry code	Description	Acquirer		Target	
		Number of acquisitions	Proportion of sample (%)	Number of acquisitions	Proportion of sample (%)
1	Agriculture, forestry, and fishing	3	0.12	5	0.20
2	Mining	84	3.28	90	3.51
3	Construction	9	0.36	13	0.44
4	Manufacturing	988	38.59	911	35.59
5	Transportation, communications, electric, gas, and sanitary services	190	7.42	158	6.17
6	Wholesale trade	55	2.15	67	2.62
7	Retail trade	83	3.24	98	3.82
8	Finance, insurance, and real estate	691	26.99	686	26.79
9	Services	437	17.07	505	19.72
10	Public administration			7	0.27
	Total	2,560	100	2,560	100

of target firm-specific information reduce the base sample to 2,560 acquisitions announcements. Of these, 2,209 were consummated, and 351 were withdrawn. In the empirical analysis, our sample size varies across different tests because of the data availability of the variables used in the test. We use the maximum number of observations available for each empirical test.

Table 1, panel B reports summary statistics of the acquisition sample by announcement year. Beginning in 1980, the number of acquisitions increases until 1987. It then remains stable before picking up again in 1994 and reaches an all-time peak in years 1997–1999. During the recent financial crisis, M&A activities shrunk significantly. These M&A waves are consistent with

Table 1. (Continued)

Panel D: Sample statistics		
	Yes	No
Cross industry	806	1,754
	(0.31)	(0.69)
Hostile	53	2,507
	(0.02)	(0.98)
Withdrawn	351	2,209
	(0.14)	(0.86)
Divested	197	2,012
	(0.10)	(0.90)

Notes. Panel A: This panel illustrates the sample construction. For the purpose of increasing test power, we use the maximum number of observations available in each of our subsequent regression results. This may result in a larger or smaller sample for the specific analysis than that in this panel depending on data requirements. Panel B–D: The sample consists of 2,560 announced U.S M&A (listed in SDC) between 1980 and 2012 in which 100% of publicly traded targets were acquired. To be included in this table, an observation has to be in at least one of the empirical analyses in this study.

[a]We keep in the sample observations for which there are data to compute at least one of the measures for target firm-specific information. The total number of observations with no data to compute nonsynchronicity is 536. The total number of observations with no data to compute abnormal accruals is 649.

economic cycles. Table 1, panel B also reports the mean and median acquirer market value, deal value, and relative deal size, defined as the ratio of the deal value to the acquirer market value of equity before an acquisition announcement.[13] Acquirer market value and deal value increase over time, both of which highly comove with M&A activities.

Table 1, panel C reports industry distribution of acquisitions based on one-digit U.S. Department of Labor industry codes. The manufacturing, financial, and services industries are heavily represented in the sample for both acquirers and targets.[14] Table 1, panel D shows statistics for deal characteristics. Among 2,560 deals, 806 (31%) of the sample acquisitions are cross-industry acquisitions, 53 (2%) are classified as hostile, 351 (14%) are withdrawn (which is higher than the 8.9% reported by Luo 2005 but comparable to the 14% reported by Skaife and Wangerin 2013), and 197 (10%) are divested in the seven-year postacquisition period (which is lower than 20% documented by Mitchell and Lehn 1990).

5. Empirical Results

5.1. Descriptive Statistics

Table 2 reports pairwise correlations between the merger efficiency measure and the explanatory and control variables used in the main analysis. Both measures of target information (nonsynchronicity and abnormal accruals) are correlated with acquisition efficiency in the expected direction. Both correlations are statistically significant at conventional levels. Correlations provide initial descriptive evidence on the positive association between target firm information and acquisition efficiency.

Table 3 provides summary statistics for the dependent and independent variables used in our empirical analysis. Target stock-return nonsynchronicity has a mean value of 1.863, which is comparable to the 1.742 reported by Piotroski and Roulstone (2004). Target abnormal accruals is 0.1 at the mean, which is similar to the 0.102 reported by Hutton et al. (2009). With respect to the control variables, the average leverage is 0.14 for acquirers and 0.15 for targets, both of which are smaller than the 0.25 reported for both acquirers and targets by Wang and Xie (2009). The acquirers and targets in our sample are also larger than those reported by Wang and Xie (2009). Our sample target firms are less profitable (mean ROA is 0.04) than those identified by Wang and Xie (2009) (mean ROA is 0.11). Half of the deals are paid fully or partially with stock.

5.2. Multivariate Regression Analysis Based on Target Stock-Return Nonsynchronicity

Table 4, column (1) reports results with the dependent variable measured by the combined abnormal returns based on a multivariate regression analysis. The coefficients on control variables are largely consistent with prior studies. Announcement returns are higher for cash-financed acquisitions, consistent with the findings of Asquith et al. (1983). Acquirer (target) size is negatively (positively) associated with announcement returns, consistent with the results of Moeller et al. (2004). The coefficient on stock-return nonsynchronicity ($NONSYNCH_i$), the variable of interest, is positive and statistically significant at the 5% level (coefficient = 0.05, t-statistic = 2.31), supporting our hypothesis that acquisition efficiency increases in the preacquisition level of target firm-specific information. From an economic perspective, an increase of one standard deviation in nonsynchronicity is associated with an increase of the combined return in the magnitude of 37 basis points, constituting approximately 20% of sample mean surplus.

Table 2. Pairwise Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
COMB_RET (1)	1													
ACQ_ABRET (2)	0.784***	1												
TRG_ABRET (3)	0.352***	0.078***	1											
ACQ_FCF (4)	−0.016	−0.002	0.099***	1										
ACQ_BTM (5)	0.098***	0.025	−0.096***	−0.193***	11									
ACQ_LEV (6)	0.033*	0.057***	−0.087***	−0.09***	0.265***	1								
ACQ_SIZE (7)	−0.167***	0.034*	0.133***	0.316***	−0.337***	−0.085***	1							
ACQ_ROA (8)	0.004	0.046**	0.085***	0.728***	−0.246***	−0.044**	0.284***	1						
TRG_BTM (9)	0.025	−0.005	−0.007	−0.047**	0.312***	0.068***	−0.147***	−0.065***	1					
TRG_LEV (10)	0.039**	0.069***	−0.037*	−0.058***	0.173***	0.393***	−0.091***	0.037*	0.121***	1				
TRG_SIZE (11)	−0.06***	−0.083***	−0.177***	0.203***	−0.172***	−0.009	0.523***	0.136***	−0.151***	−0.107***	1			
TRG_ROA (12)	0.048**	0.015	−0.024	0.245***	−0.007	0.152***	0.037*	0.336***	0.021	0.136***	0.207***	1		
PERC_STOCK (13)	−0.14***	−0.205***	−0.141***	−0.172***	−0.047**	−0.053***	−0.138***	−0.219***	0.002	−0.11***	0.064***	−0.094***	1	
NONSYNCH (14)	0.035*	0.074***	−0.004	−0.037*	0.007	0.031	−0.211***	−0.089***	0.062***	−0.004	−0.373***	−0.070***	0.101***	1
ABN_ACCRUALS	−0.078***	−0.062***	0.029	−0.015	−0.07***	−0.094***	0.017	−0.049**	−0.059**	−0.157***	−0.065***	−0.145***	0.054**	0.018

Note. This table reports pairwise correlations of the dependent variables, control variables, and the explanatory variables used in the analyses.
*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Table 3. Descriptive Statistics: Deal and Acquirer Characteristics

Variable	Mean	SD	25%	50%	75%
Dependent					
COMB_RET	0.019	0.072	−0.016	0.010	0.050
ΔROA	0.006	0.145	−0.021	0.000	0.024
ACQ_ABRET	−0.010	0.066	−0.037	−0.007	0.019
TRG_ABRET	0.296	0.311	0.098	0.260	0.455
Explanatory					
NONSYNCH	1.863	0.738	1.397	1.888	2.327
ABN_ACCRUALS	0.101	0.091	0.042	0.071	0.127
Controls					
ACQ_FCF	0.015	0.130	0.008	0.025	0.067
ACQ_BTM	0.472	0.380	1.08	1.38	2.21
TRG_BTM	0.630	0.807	0.310	0.557	0.830
ACQ_LEV	0.136	0.126	0.034	0.110	0.201
TRG_LEV	0.149	0.164	0.02	0.11	0.24
ACQ_SIZE	13.991	1.869	12.695	13.905	15.116
TRG_SIZE	11.347	1.282	10.452	11.450	12.337
ACQ_ROA	0.113	0.146	0.032	0.117	0.194
TRG_ROA	0.044	0.215	0.016	0.062	0.147
PERC_STOCK	50.354	46.460	0.000	55.555	100

Notes. This table reports descriptive statistics on the dependent, explanatory, and control variables used in the different analyses. The table reports mean, standard deviation, 25, 50, and 75 percentiles. All variables are defined in the appendix.

In Table 4, column (2), we check whether the results are robust to acquisition efficiency measured based on combined peer-firm-adjusted abnormal returns as discussed in §3.1. The coefficient on target stock-return nonsynchronicity (*NONSYNCH*) continues to be positive and significant at the 5% level (coefficient = 0.005, t-statistic = 2.13). Next, we replace the market-based measure of acquisition efficiency with the change in long-term operating performance for the combined company. Table 4, column (3) summarizes the results for the long-term operating performance analysis. Consistent with our expectation, the coefficient on target stock-return nonsynchronicity is positive and statistically significant at the 5% level (coefficient = 0.005, t-statistic = 2.05). In addition, the coefficient on the previous year value-weighted-average ROA of the acquirer and the target (*LAG_AV_ROA*) is negative and statistically significant.

5.3. Multivariate Regression Analysis Based on Target Abnormal Accruals

In this section, we replace the explanatory variable—target stock-return nonsynchronicity—with abnormal accruals and report the results in columns (4)–(6) of Table 4. Our results suggest that acquisition efficiency (measured by both market-model-based combined returns and peer-adjusted combined returns) decreases with preacquisition abnormal accruals (*ABN_ACCRUALS*) of the target (coefficient = −0.044 and −0.051, t-statistic = −1.95 and −1.85). When acquisition efficiency is measured by the change in operating

Table 4. OLS Estimation of a Model of Expected Acquisition Efficiency

		Nonsynchronicity			Abnormal accruals		
Variable	Predicted sign	Combined returns (1)	Oler returns (2)	Change in ROA (3)	Combined returns (4)	Oler returns (5)	Change in ROA (6)
NONSYNCH	+	0.005**	0.005**	0.005**			
		(2.31)	(2.13)	(2.05)			
ABN_ACCRUALS	−				−0.044*	−0.051*	−0.031
					(−1.95)	(−1.85)	(−0.96)
ACQ_FCF		0.026	−0.017	0.257**	−0.002	−0.030	0.423***
		(0.47)	(−0.24)	(2.22)	(−0.08)	(−0.61)	(3.27)
ACQ_BTM		0.011	−0.001	−0.015	0.013	−0.002	−0.013
		(0.95)	(−0.06)	(−1.04)	(1.17)	(−0.19)	(−0.54)
TRG_BTM		−0.003	−0.002	0.005	−0.002	−0.002	0.007**
		(−0.81)	(−0.52)	(1.26)	(−0.64)	(−0.53)	(2.05)
ACQ_LEV		0.005	0.022	0.038	0.002	−0.001	0.063
		(0.26)	(1.13)	(1.45)	(0.12)	(−0.04)	(1.58)
TRG_LEV		0.003	−0.009	0.008	−0.014	−0.009	0.009
		(0.22)	(−0.81)	(0.73)	(−1.08)	(−0.65)	(0.53)
ACQ_SIZE		−0.008***	−0.008***	0.005***	−0.006***	−0.007***	0.011***
		(−6.79)	(−5.71)	(3.41)	(−4.54)	(−4.34)	(3.96)
TRG_SIZE		0.005***	0.004*	0.002	0.001	0.001	−0.001
		(2.63)	(1.93)	(0.75)	(0.48)	(0.36)	(−0.17)
ACQ_ROA		−0.012	0.017		0.004	0.015	
		(−0.34)	(0.36)		(0.13)	(0.36)	
TRG_ROA		0.006	0.017*		0.005	0.015	
		(0.46)	(1.72)		(0.40)	(1.35)	
LAG_AV_ROA				−0.583***			−0.814***
				(−10.65)			(−8.17)
PERC_STOCK		−0.000***	−0.000***	−0.000	−0.000***	−0.000***	−0.000
		(−5.86)	(−6.06)	(−1.61)	(−5.83)	(−5.27)	(−1.54)
INDSAME		0.009**	0.007	0.008	0.013***	0.006	0.016***
		(2.17)	(1.58)	(1.42)	(3.05)	(1.50)	(2.62)
POOLING				0.019***			0.045***
				(3.05)			(3.90)
INTERCEPT		0.068***	0.087***	−0.055	0.103***	0.123***	−0.065
		(2.79)	(3.32)	(−1.44)	(3.80)	(4.33)	(−1.28)
Number of observations		1,883	1,648	1,647	1,560	1,414	1,362
Adjusted R^2 (%)		6.2	5.4	37.4	5.2	4.4	67.1

Notes.

$$EFFICIENCY_i = \beta_0 + \beta_1 FS\_INFO_i + \beta_2 CONTROLS + ACQIndustry\ fixed\ effects + \varepsilon_i.$$

This table reports the results of multivariate analysis of the relation between target firm-specific information and acquisition efficiency using three different constructs to measure efficiency and two different constructs to measure target firm-specific information. Columns (1)–(3) (columns (4)–(6)) report results for regressions in which target firm-specific information is measured using stock-return nonsynchronicity (abnormal accruals). In columns (1) and (4), *EFFICIENCY* is measured as the weighted-average announcement-day abnormal returns of the acquirer and the target. In columns (2) and (5), *EFFICIENCY* is measured as the weighted-average announcement-day abnormal returns of the acquirer and the target over a sample of matched firms following Oler (2008). In columns (3) and (6), *EFFICIENCY* is measured as the change in the combined firm ROA. Standard errors are clustered by firm and year. All variables are defined in the appendix.

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

performance, the coefficient on *ABN_ACCRUALS* continues to be negative, although statistically it becomes insignificant. Overall, we find results largely consistent with the hypothesis that preacquisition target firm-specific information is positively associated with acquisition efficiency.

5.4. Additional Analyses

In this section, we test the effect of preacquisition target firm-specific information on the likelihood that a consummated acquisition will result in a divestiture or that an announced acquisition will be withdrawn. We also conduct one cross-sectional test examining the differential effect of preacquisition target firm-specific information between within-industry and cross-industry acquisitions. Finally, we perform a falsification test replacing stock-return nonsynchronicity with earnings nonsynchronicity.

5.4.1. Postacquisition Divestiture. Assuming that postacquisition divestitures indicate poor outcomes, we

predict that targets with more preacquisition firm-specific information are less likely to be divested. We link an acquisition to a divestiture by merging the acquisition sample with a divestiture sample obtained from the SDC. We first match a divested firm with a target of the same acquirer based on the name. We then match the target with the divested firm of the same acquirer based on the four-digit SIC industry code and the state of the headquarters.

To investigate whether the availability of target firm-specific information reduces the likelihood that the target will be divested, we estimate the following regression:

$$DIVEST_i = \beta_0 + \beta_1 NONSYNCH_i + \beta_2 ACQ_{\text{controls}} + \beta_3 TRG_{\text{controls}} + \beta_4 DEAL_{\text{controls}} + \varepsilon_{i,}, \quad (5)$$

where $DIVEST_i$ denotes a binary variable that takes the value 1 for a divested target in the seven years following the acquisition announcement and 0 otherwise. In the absence of a model in the literature predicting the likelihood of divestitures, we include the same set of control variables as in Equation (4) to be parsimonious.

Table 5, column (1) reports the results of divestiture analysis estimated from the logit model. The dependent variable is the probability of a subsequent divestiture. The coefficient on target stock-return nonsynchronicity—the variable of interest—is negative and statistically significant at the 5% level (coefficient = −0.263, t-statistic = 2.05), suggesting that a higher level of preacquisition firm-specific information at the target reduces the subsequent likelihood of divestiture, thus improving economic efficiency.[15] Economically, an increase of one standard deviation in target stock-return nonsynchronicity decreases the probability that an acquired target is divested by 15%.[16]

5.4.2. Likelihood of Withdrawal of an Announced Acquisition. Most acquisitions do not become effective on the announcement day (92% of the acquisitions in our sample), and announced acquisitions are occasionally withdrawn. Reasons for withdrawal can range from problems with deal approval by relevant authorities, a negative market reaction (Luo 2005), or negative information uncovered during due diligence. Marquardt and Zur (2015) and Cain et al. (2014) provide evidence that the likelihood of an announced acquisition being completed increases with the target's accounting quality. We posit that negative information revealed on an opaque target after an announcement can prompt the acquirer to downwardly revise its estimate of the common value, thus leading to a withdrawal decision.[17] To investigate whether the availability of target firm-specific information reduces the likelihood that negative information about the target will be discovered after the acquisition announcement and therefore reduces the likelihood of withdrawing decisions, we estimate the following regression:

$$WITHDRAW_i = \beta_0 + \beta_1 NONSYNCH_i + \beta_2 ACQ_{\text{controls}} + \beta_3 TRG_{\text{controls}} + \beta_4 DEAL_{\text{controls}} + \beta_5 ACQ\_ABRET + \beta_6 HOSTILE + \beta_7 PREM + \varepsilon_i, \quad (6)$$

where $WITHDRAW_i$ denotes a binary variable that takes the value 1 for a withdrawn acquisition and 0 otherwise; and ACQ_{controls}, TRG_{controls}, and $DEAL_{\text{controls}}$ denote the same set of control variables as in Equation (4), consisting of acquirer characteristics, target characteristics, and deal characteristics. In this analysis, we relax one sample restriction and impose one new restriction. Specifically, we include announced acquisitions that were withdrawn. We exclude from the sample the acquisitions for which the announcement date is also the effective date, because deals that are closed on announcement dates do not give the acquirer time to learn additional information about the target.

Following Luo (2005), who suggests that the likelihood of a withdrawn acquisition increases when the market reaction to an acquisition is negative, we include in the regression the acquirer's announcement day returns as an additional control variable (*ACQ_ABRET*). We expect the likelihood of withdrawals after acquisition announcements to decrease with target firm-specific information, namely to decrease with target stock-return nonsynchronicity. Following Marquardt and Zur (2015), we also add a control variable for a hostile acquisition (*HOSTILE*) and for the premium over market price offered for the target (*PREM*), both of which are expected to increase the likelihood of a withdrawal.

Table 5, column (2) summarizes the estimation results. Consistent with our expectation, the coefficient on target nonsynchronicity is negative and statistically significant at the 10% level (coefficient = −0.185, t-statistic = −1.82). Economically, an increase of one standard deviation in target stock-return nonsynchronicity decreases the probability of a withdrawal by 9%. Results also indicate that hostile takeovers and cross-industry acquisitions are more likely to be withdrawn. Acquisitions with large acquirers are less likely to be withdrawn, whereas acquisitions of large targets are more likely to be withdrawn.

5.4.3. Within-Industry vs. Cross-Industry Acquisitions. The availability of target firm-specific information is likely to be less important to estimate common values in situations where acquirers have more channels to collect information about the target. When the two parties come from the same industry, the acquirer can have business ties with the target such as sharing a product market and a pool of suppliers and customers.

Table 5. Divestiture, Withdrawals, Industry Affiliation, and Preacquisition Ownership

Variable	Predicted sign	Divestiture (1)	Withdrawn (2)	Within Industry (3)
NONSYNCH	−	−0.263**	−0.183*	0.010***
		(−2.05)	(−1.82)	(2.63)
INDSAME × *NONSYNCH*	+			−0.008*
				(−1.76)
ACQ_FCF		0.743	−0.762	0.027
		(0.64)	(−0.83)	(0.48)
ACQ_BTM		0.462	0.168	0.011
		(1.63)	(0.74)	(0.98)
TRG_BTM		0.266*	−0.375***	−0.003
		(1.84)	(−3.03)	(−0.82)
ACQ_LEV		−0.699	0.428	0.004
		(−0.77)	(0.72)	(0.23)
TRG_LEV		−0.150	0.206	0.002
		(−0.25)	(0.42)	(0.13)
ACQ_SIZE		0.027	−0.399***	−0.008***
		(0.43)	(−7.16)	(−6.76)
TRG_SIZE		0.186**	1.083	0.005***
		(1.96)	(1.39)	(2.57)
ACQ_ROA		−0.571	0.484	−0.013
		(−0.48)	(0.54)	(−0.36)
TRG_ROA		0.279	0.522	0.006
		(0.54)	(1.41)	(0.47)
PERC_STOCK		0.001	−0.005***	−0.000***
		(0.68)	(−2.92)	(−5.91)
INDSAME		−0.508**	−0.351**	0.023***
		(−2.41)	(−2.29)	(2.62)
HOSTILE			3.529***	
			(7.82)	
ACQ_ABRET			−1.450	
			(−1.36)	
PREM			−0.312***	
			(−2.62)	
INTERCEPT		−4.180***	−308.495***	0.060**
		(−2.76)	(−2.59)	(2.41)
Number of observations		1,560	2,138	1,883
Adjusted R^2 (%)		7.6	18.3	6.5

Notes. This table report the results of four different analyses as follows. Column (1): a logit estimation of the effect of target firm nonsynchronicity on the probability of a divestiture of the target by the acquirer in the seven years following an acquisition. Column (2): a logit estimation of the effect of target-firm nonsynchronicity on the probability that an announced acquisition was withdrawn. Column (3): an OLS estimation of Equation (4) testing the differential effect of cross-industry versus within-industry acquisitions. We add an interaction between target nonsynchronicity and whether the acquirer and the target are from the same industry. Industry fixed effects are included in all analyses. Standard errors are clustered by firm and year. All variables are defined in the appendix.

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

In these cases, target firm-specific information available to investors in the stock market may play a less important role in assisting the acquirer evaluating the common value of the target. Following this reasoning, we predict that the positive association between target firm-specific information and acquisition efficiency is stronger for cross-industry acquisitions than for within-industry acquisitions.

Results are reported in Table 5, column (3), with the dependent variable measured by market-model-based combined returns. We add an interaction variable between target stock-return nonsynchronicity and the relatedness of the acquirer and the target businesses (*NONSYNCH* × *INDSAME*) to Equation (4). The coefficient on target stock-return nonsynchronicity is positive, suggesting that target firm-specific information before acquisitions improves acquisition efficiency for cross-industry acquisitions. The coefficient on the interaction term (*NONSYNCH* × *INDSAME*) is negative and statistically significant at the 10% level (t-statistic = −1.76). The economic significance of an increase of one standard deviation in nonsynchronicity for a cross-industry merger is associated with an increase of 100 basis points in combined returns. By contrast, for a within-industry acquisition, the impact of nonsynchronicity is reduced by 80% to 20 basis points. We find a positive and significant coefficient on *INDSAME*, suggesting that acquisition efficiency is higher for within-industry acquisitions. This evidence is consistent with acquirers having less uncertainty in estimating the common value of the target for within-industry acquisitions, which leads to a higher weight being placed on the private value estimation, resulting in higher efficiency.

5.4.4. Falsification Test: Nonsynchronicity of Fundamentals. Throughout the study, we rely on the literature contending that stock-return nonsynchronicity measures firm-specific information. Our inference on the relation between firm-specific information and acquisition efficiency hinges on the idea that stock-return nonsynchronicity gauges information. However, stock nonsynchronicity may capture fundamental differences between a firm and its industry peers. To address this issue, we perform a falsification test replacing stock-return nonsynchronicity with earnings nonsynchronicity in which earnings nonsynchronicity is constructed similarly to stock-return nonsynchronicity. The logic behind this is that earnings nonsynchronicity gauges a firm's fundamental differences from peers. If results were driven by a firm's fundamental differences rather than information-related differences, we would then expect earnings nonsynchronicity to have a similar effect on acquisition efficiency as stock-return nonsynchronicity. Untabulated results show that earnings nonsynchronicity is not correlated with acquisition efficiency measured by combined stock returns. Therefore, our results are unlikely to reflect the effect of a firm's fundamental differences from industry peers on acquisition efficiency.

6. Further Discussion and Analysis

6.1. Wealth Transfer Between Target Shareholders and Acquirer Shareholders

Though the focus of this study is on the total surplus, we also revisit the question of how surplus resulting from target transparency is shared between the target's and the acquirer's shareholders. Although there is agreement that acquirer shareholders stand to benefit from greater target transparency, theory does not provide a clear-cut prediction with regards to target shareholders. Milgrom and Weber (1982) point out that the effect of target information on its shareholders' proceeds from the sale of the firm depends on whether such information is complementary or substitutive to the bidders' information. If complementary, then target information is likely to increase bidders' profits while reducing target proceeds. If substitutive, then target information likely increases target proceeds. Goeree and Offerman (2003) demonstrate that more precise target information can benefit target shareholders. However, they do acknowledge the argument of Milgrom and Weber (1982).

Therefore, we have no prediction of the effect of target firm-specific information on target shareholders. Table 6 reports results based on Equation (4) substituting combined value-weighted returns (efficiency) with acquirer and target abnormal announcement returns, respectively, as the dependent variable, computed from the market model. The results suggest that, although target shareholders' wealth decreases with target firm-specific information (coefficient = −0.028, t-statistic = −2.53), acquirer shareholders benefit from target firm-specific information (coefficient = 0.008, t-statistic = 3.87).

These results beg the question: why in equilibrium would a firm choose a disclosure policy that promotes transparency if, in an acquisition, an opaque target is rewarded? The literature suggests a few possible explanations. First, the availability of firm-specific information can depend on factors sometimes beyond the target's control, such as the level of private information revealed by informed traders. Second, based on accounting information, which is arguably controlled by the firm, prior studies still find that target shareholders are penalized for transparency (Skaife and Wangerin 2013, Raman et al. 2013, McNichols and Stubben 2015). These studies generally argue that acquirers pay more to extract information from an opaque target in negotiated deals (Raman et al. 2013) and that targets may bear other costs of being opaque, such as a higher likelihood of renegotiation (Skaife and Wangerin 2013) and a higher likelihood that the announced acquisition will be withdrawn (Marquardt and Zur 2015). Finally, firms choose their disclosure policy based on a broad cost-benefit analysis in which the effect on a potential acquisition premium is only one factor. Voluminous research shows the benefits of transparency, which include a lower cost of capital (Botosan and Plumlee 2002), efficient investments (Biddle et al. 2009), and a lower crash risk (Hutton et al. 2009).

Table 6. OLS Estimation of a Model of Acquirer and Target Returns

Variable	Predicted sign	*ACQ_RET* (1)	*TRG_RET* (2)
NONSYNCH	–	0.008***	−0.028***
		(4.01)	(−2.55)
ACQ_FCF		−0.023	0.212
		(−0.48)	(1.46)
ACQ_BTM		0.008	−0.064*
		(0.93)	(−1.85)
TRG_BTM		−0.005	−0.001
		(−1.52)	(−0.04)
ACQ_LEV		0.015	0.001
		(0.93)	(0.01)
TRG_LEV		0.011	−0.015
		(0.90)	(−0.29)
ACQ_SIZE		0.004***	0.037***
		(3.49)	(6.43)
TRG_SIZE		−0.004**	−0.083***
		(−2.31)	(−9.29)
ACQ_ROA		0.015	−0.140
		(0.43)	(−1.28)
TRG_ROA		0.003	0.052
		(0.23)	(0.95)
PERC_STOCK		−0.000***	−0.000**
		(−7.38)	(−2.10)
INDSAME		0.006	0.014
		(1.44)	(0.76)
HOSTILE		−0.037	0.104
		(−1.40)	(1.07)
NO_BIDDERS		−0.003	−0.020
		(−0.54)	(−0.82)
INTERCEPT		−0.024	0.835***
		(−1.07)	(6.81)
Number of observations		1,883	1,883
Adjusted R^2 (%)		5.5	11.5

Notes.

$$ACQ\_RET/TRG\_RET_i = \beta_0 + \beta_1 FS\_INFO_i + \beta_2 CONTROLS + ACQIndustry\ fixed\ effects + \varepsilon_i.$$

This table reports the results of an analysis of the relation between target firm-specific information and acquirer and target announcement-day returns using two different constructs to measure target firm-specific information. Columns (1) and (2) report results for regressions in which target firm-specific information is measured using stock-return nonsynchronicity. Column (1) reports results for acquirer returns. Column (2) reports results for target returns. Standard errors are clustered by firm and year. All variables are defined in the appendix.

*, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

6.2. Acquirer Preacquisition Firm-Specific Information

Our variable of interest is target firm-specific information before acquisitions. However, the acquirer information level before acquisitions may also affect

Table 7. The Role of Acquirer Firm-Specific Information

Variable	Predicted sign	Combined returns (1)	*ACQ_RET* (2)	*TRG_RET* (3)
NONSYNCH	+	0.004**	0.008***	−0.030***
		(2.13)	(4.01)	(−2.57)
ACQ_NONSYNCH	?	0.003*	0.001	0.005
		(1.69)	(0.75)	(0.52)
ACQ_FCF		0.100**	0.037	0.338**
		(2.08)	(0.89)	(2.18)
ACQ_BTM		−0.006	−0.001	−0.128***
		(−0.89)	(−0.12)	(−4.23)
TRG_BTM		−0.001	−0.005	0.008
		(−0.35)	(−1.43)	(0.38)
ACQ_LEV		0.022	0.020	0.071
		(1.22)	(1.19)	(0.94)
TRG_LEV		0.005	0.011	0.000
		(0.43)	(1.04)	(0.01)
ACQ_SIZE		−0.008***	0.004***	0.030***
		(−5.15)	(2.93)	(4.10)
TRG_SIZE		0.004**	−0.004***	−0.082***
		(2.28)	(−2.55)	(−9.15)
ACQ_ROA		−0.054	−0.028	−0.145
		(−1.54)	(−0.83)	(−1.11)
TRG_ROA		0.015	0.011	0.049
		(1.38)	(1.16)	(0.74)
PERC_STOCK		−0.000***	−0.000***	−0.000*
		(−7.27)	(−8.36)	(−1.87)
INDSAME		0.006	0.003	0.015
		(1.48)	(0.82)	(0.80)
HOSTILE			−0.032	0.107
			(−1.19)	(1.13)
NO_BIDDERS			−0.003	−0.020
			(−0.64)	(−0.77)
INTERCEPT		0.079***	−0.013	0.950***
		(3.21)	(−0.58)	(6.75)
Number of observations		1,709	1,709	1,709
Adjusted R^2 (%)		7.9	7.3	12.5

Notes.

$$DEP\_VAR_i = \beta_0 + \beta_1 TRG\_FS\_INFO_i + \beta_2 ACQ\_FS\_INFO_i + \beta_3 CONTROLS + ACQIndustry\ fixed\ effects + \varepsilon_i.$$

This table reports results of an analysis of the effect of acquirer firm-specific information on acquisition efficiency, acquirer returns, and target returns. Column (1) reports results for acquisition efficiency. Column (2) reports results for acquirer announcement-day returns. Column (3) reports results for target announcement-day returns. Acquirer firm-specific information is measured using acquirer stock-return nonsynchronicity. Standard errors are clustered by firm and year. All variables are defined in the appendix.

*, **, and *** denote statistical significance level at 10%, 5%, and 1% levels, respectively.

acquisition efficiency and thus presents a correlated omitted variable. To address this concern, we explicitly control for acquirer stock-return nonsynchronicity; the results are reported in Table 7. The sample size is reduced because of the additional data requirement for computing acquirer nonsynchronicity. The coefficient on target stock-return nonsynchronicity (*NONSYNCH*) continues to be positive and statistically significant at the 5% level. The coefficient on acquirer stock-return nonsynchronicity (*ACQ_NONSYNCH*) is also positive and statistically significant at the 10% level, suggesting that acquirer information improves acquisition efficiency but does not seem to have an effect on either party to the transaction. The positive effect of acquirer information on acquisition efficiency is consistent with our previous discussion in §2.2 in which information asymmetry between the acquirer and target in privately negotiated deals regarding private value reduces acquisition efficiency. As such, better acquirer information may improve the target estimate of the acquirer's private value, leading to greater efficiency.

6.3. Private Target Acquisition

Throughout the study, we focus on acquisitions of public targets due to the availability of the variables of interest in the empirical analysis. However, our results may also have implications for private firms. For example, Capron and Shen (2007) find that acquirers favor private targets in familiar industries and turn to public targets to enter new business domains or industries with a high level of intangible assets. Their results are consistent with ours, in which we find that firm-specific information at the target has a lesser effect on acquisition efficiency for within-industry acquisitions.

Prior research suggests that, on average, the premium paid to targets' shareholders is lower and returns for acquirers are higher when acquiring a private target. Koeplin et al. (2000), Kooli et al. (2003), Fuller et al. (2002), and Officer (2007) all provide evidence consistent with a lower premium for private targets' shareholders resulting from an illiquidity discount because of the lack of an active market for their shares. The benefit to acquirers' shareholders from private target discount has been documented extensively (Jensen and Ruback 1983, Jarrell et al. 1988, Loughran and Vijh 1997, Andrade et al. 2001, Moeller et al. 2005, Fuller et al. 2002, Moeller et al. 2004, Faccio et al. 2006, Chang 1998, Poulsen and Stegemoller 2008). However, no research that we are aware of has explored the effect of private target-firm opacity on the overall asset-allocation efficiency of private acquisitions. We leave this important inquiry for future research.

6.4. Pre- and Postfinancial Crisis

The recent financial crisis has affected the U.S. economy deeply, as firms have experienced a significant reduction in investment (Duchin et al. 2010) and credit rationing (Ivashina and Scharfstein 2010). To test whether the financial crisis has had any effect on the relation between target firm-specific information and acquisition efficiency, we break down our sample into the precrisis period (1980–2007) and postcrisis period (2010–2012). Untabulated results show that target firm-specific information has a positive effect on acquisition efficiency for both the pre- and postcrisis periods

and that no differential effect exists between the two periods.

7. Conclusion

This study builds on economic theory from the auction literature to argue that target transparency increases the precision of estimating common values in acquisitions by acquirers. This, in turn, increases the likelihood that a potential acquirer with the highest private value will merge with the target, thereby improving economic efficiency. Consistent with this argument, we provide empirical evidence that the preacquisition level of target firm-specific information increases the expected total surplus from an acquisition. The effect of target firm-specific information is smaller when acquirers have alternative channels of gathering information about the target, such as when the acquirer and the target operate in the same industry. Further analysis suggests that the probability of a negative outcome of an announced acquisition—in the form of a subsequent withdrawal or divestiture—decreases with target transparency and corroborates the main analysis. Finally, we find results similar to those documented in several concurrent studies that, on average, acquirer shareholders benefit from target firm-specific information, whereas target shareholders are penalized for being transparent when the firm is acquired.

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Appendix. Variable Definitions

Variable	Description
Dependent	
COMB_RET	Acquirer and target value-weighted average cumulative abnormal returns measured over three days around the acquisition announcement $(-1,+1)$ for the acquirer and over 22 days around the acquisition announcement $(-20,+1)$ for the target. Abnormal returns are market adjusted, value weighted.
ACQ_ABRET	Acquirer cumulative abnormal returns measured over three days around the acquisition announcement $(-1,+1)$.
TRG_ABRET	Target cumulative abnormal returns measured over 22 days around the acquisition announcement $(-20,+1)$.
ΔROA	Change in ROA from year $t-1$ (acquirer and target weighted average) to year $t+1$ (combined entity). ROA is measured as operating income before depreciation at year t scaled by average of year t and year $t-1$ total assets.
WITHDRAWN	A binary variable that takes the value 1 if the announced acquisition was subsequently withdrawn and zero otherwise.
Explanatory	
NONSYNCH	Three-year average of target-return nonsynchronicity ending in the calendar year before the acquisition announcement. Measured as $-\log(R^2/(1-R^2))$, where R^2 is estimated annually based on the following regression: $RET_{i,t}=\beta_0+\beta_1 MARET_{i,t-1}+\beta_2 MARET_{i,t}+\beta_3 INDRET_{i,t-1}+\beta_4 INDRET_{i,t}+\varepsilon_{i,t}$, where $MARET_{i,t}$ is the value-weighted market return, and $MARET_{i,t-1}$ denotes the value-weighted market return for the previous week; $INDRET_{i,t}$ denotes the industry (two-digit Standard Industrial Classification (SIC) codes) return at week t with firm i's return omitted.
ABN_ACCRUALS	Three-year average target discretionary (abnormal) accruals ending in the year before the acquisition announcement. Discretionary accruals are computed as follows: $$DISC\_ACC = TOT\_ACCRUALS_{i,t} - \left[\hat{\alpha}_0 \frac{1}{ASSETS_{i,t-1}} + \hat{\beta}_1 \frac{\Delta SALES_{i,t} - \Delta AR_{i,t}}{ASSETS_{i,t-1}} + \hat{\beta}_2 \frac{PPE_{i,t}}{ASSETS_{i,t-1}}\right],$$ where $TOT\_ACCRUALS_{i,t}$ denotes total accruals for firm i in year t; $\Delta SALES_{i,t}$ denotes change in firm i's sales in year t; $\Delta AR_{i,t}$ denotes change in firm i's accounts receivable in year t; and $PPE_{i,t}$ denotes firm i's property, plant, and equipment in year t; $\hat{\alpha}_0$, $\hat{\beta}_1$, and $\hat{\beta}_2$ are estimated from the following regression: $$\frac{TOT\_ACCRUALS_{i,t}}{ASSETS_{i,t-1}} = \alpha_0 \frac{1}{ASSETS_{i,t-1}} + \beta_1 \frac{\Delta SALES_{i,t}}{ASSETS_{i,t-1}} + \beta_2 \frac{PPE_{i,t}}{ASSETS_{i,t-1}} + \varepsilon_{i,t}.$$
Control	
ACQ_FCF	Acquirer preacquisition free cash flow. Measured as operating income before depreciation minus interest expense minus income taxes minus capital expenditure deflated by total assets at the fiscal year end before an acquisition announcement. Compustat: (oibdp-xint- txt-capx)/at.
ACQ_BTM	Acquirer's preacquisition book-to-market ratio. Measured as the ratio of acquirer's book value of equity to the market value of equity at the fiscal year-end before an acquisition announcement.
ACQ_LEV	Acquirer's preacquisition leverage. Measured as the sum of long-term debt and short-term debt deflated by the market value of total assets at the fiscal year-end before an acquisition announcement.

Appendix. (Continued)

Variable	Description
Control (continued)	
ACQ_SIZE	Acquirer size. Measured as the natural logarithm of acquirer's market value one day before the announcement day.
TACQ_ROA	Acquirer return on assets for the year ending before the announcement year, measured as operating income before depreciation scaled by average total assets.
TRG_BTM	Target's preacquisition book-to-market ratio. Measured as the ratio of target's book value of equity to the market value of equity at the fiscal year-end before an acquisition announcement.
TRG_LEV	Target's preacquisition leverage. Measured as the sum of long-term debt and short-term debt deflated by the market value of total assets at the fiscal year-end before an acquisition announcement.
TRG_SIZE	Target's size measured as the natural logarithm of the acquirer's market value 20 days before the announcement day.
TRG_ROA	Target's return on assets for the year ending before the announcement year, measured as operating income before depreciation scaled by average total assets.
PERC_STOCK	The percentage of the purchase price that is paid out using the acquirer equity.
INDSAME	A binary variable that takes the value 1 if the acquirer and the target share the same two-digit SIC industry classification code and 0 otherwise.
HOSTILE	A binary variable that takes the value 1 if the acquisition was achieved through hostile takeover and 0 otherwise.

Endnotes

[1] Data used in this study are available from Compustat, SDC, and Center for Research in Security Prices (CRSP) databases and other public sources.

[2] Boone and Mulherin (2007) document that over 50% of acquisitions are implemented through an auction. We therefore motivate our study based on auction theory. However, we also consider privately negotiated deals in §2.2, and the prediction applies to these cases as well.

[3] See detailed discussion in §2.2.

[4] In addition, McNichols and Stubben (2015) focus on accounting quality and measure its effect on acquirer and target shareholders separately. They simultaneously include in the regression a proxy for uncertainty (measured as stock-return volatility). Both their accounting-quality and uncertainty measures capture part of the overall target information quality that our measure of stock-return nonsynchronicity aims to capture. Therefore it is difficult to make inferences from their empirical results where target-return and acquirer-return regressions are run separately, each based on a different sample (sample sizes in various analyses vary extensively) and each using a component of the overall target firm-specific information.

[5] Though our hypothesis is built on auction theory, we discuss in §2.2 how our prediction also applies to negotiated deals.

[6] Results are qualitatively similar if we measure target abnormal returns during the $(-1, +1)$ window around the announcement day.

[7] We also use market-adjusted, value-weighted, and equally weighted abnormal returns and size-adjusted returns to test our hypotheses. Results are quantitatively similar to those based on market-model prediction errors.

[8] Our results continue to hold when we pick three or five peer firms. Therefore, our results are insensitive to the choice of the number of peers.

[9] Wang and Xie (2009) also use the change in the merged companies' ROA to measure the efficiency gains from acquisitions.

[10] Armstrong et al. (2012) suggest that the quality of public information improved following the anti-takeover legislation wave leading to less private-information gathering.

[11] Studies that associate nonsynchronicity with firm-specific information use the market model to gauge synchronicity in cross-country analysis, probably due to lack of comparable industry-classification information across countries, and a model that includes industry returns for the U.S. firm-level analysis.

[12] We follow Piotroski and Roulstone (2004) and measure nonsynchronicity as the minus sign of the $\log(R^2/(1-R^2))$. We use a three-year average ending in the fiscal year-end immediately before the acquisition announcement to gauge target firm-specific information because a longer window allows us to capture a firm's information environment, which should be relatively stable.

[13] The mean relative size in our sample (0.24) is 8% smaller at the mean than the value reported by Shalev et al. (2013), but it is comparable at the median (14% versus 16%).

[14] Though our main analysis is based on the full sample containing financial firms, the untabulated results show that all findings continue to hold when we focus on nonfinancial firms only.

[15] We also explore the effect of target firm-specific information on postacquisition goodwill impairment with the assumption that goodwill impairment indicates a poor acquisition outcome. However, we do not find an association between these two. Note that it is very difficult, if not impossible, to discern the portion of impairment associated with a specific acquisition. Hayn and Hughes (2006) report that only 30% of goodwill impairments can be traced to a specific acquisition. Thus future impairment tests are likely to be very noisy, which may explain the insignificant results.

[16] The point estimate of the probability of divestiture at the mean of all regression variables is 10.83%. The point estimate for a change of one standard deviation in *NONSYNCH*, keeping all other variables constant at the mean, is 9.197%. Thus the effect of a change of one standard deviation in *NONSYNCH* measured at the mean is $(10.83 - 9.19)/10.83 = 15\%$.

[17] We acknowledge, however, that, to the extent that the acquirer has completed comprehensive due diligence before the acquisition announcement, this projected relation may be mitigated and therefore we may find nothing.

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