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The Value of (Stock) Liquidity in the M&A Market

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Abstract

We study the value of stock liquidity in the market for corporate control and show that the target firm's liquidity has an impact on the transaction itself as well as on the resulting merged entity. We use a sample of US M&A transactions 1987 through 2007 to show that acquiring a more liquid firm makes the stock of the acquirer more liquid. This has consequences on M&A activity and pricing. Public acquirers are more likely than private acquirers to acquire more liquid targets. It also translates into a greater likelihood of completing the deal and higher compensation for the target.

I. Introduction

In mergers and acquisitions (M&As), target shareholders receive a substantial premium if the acquirer is a public rather than a private firm (Bargeron et al. (2008)). This phenomenon is hard to reconcile with fundamental differences between the public and private acquirers. Moreover, it is puzzling that public firms agree to pay a higher premium. Yet, there is one characteristic that is of different interest to public versus private acquirers: the *liquidity* of the target's stock.

Shareholders of public firms value the option to liquidate their position swiftly and without adverse effects on the price. For example, some institutional investors – e.g., mutual funds – may face investor withdrawals and therefore prefer stocks that guarantee them to exit from their investment fast and with little capital loss: more liquid stocks. The lower exit costs also make liquid stocks more attractive to blockholders who can increase firm value by monitoring. In taking over a firm with a more liquid stock (which we refer to as a "liquid firm") the acquirer also takes over the underlying liquidity of its stock. High liquidity will likely appeal to a broader base of potential investors. A liquid target, by increasing the liquidity of the acquirer, will expand its

shareholder base and therefore should be more attractive to public acquirers than otherwise equal deals in which the liquidity of the target's stock adversely affect their own stock's liquidity.

If stock liquidity is valued, then a public acquirer should be willing to pay more for liquid target firms. That willingness should translate into a higher premium paid and thus a greater probability of the bid's success. In short, liquid targets can gain more from selling to public than to private acquirers and thus prefer the former, holding all other characteristics constant.

We test these hypotheses using 4,691 US M&A transactions involving publicly listed target firms for the period 1987–2007. To ensure that our proxies for liquidity do not capture other firm characteristics, our estimations incorporate a set of firm-specific and industry controls, which include asset liquidity, size, as well as determinants related to information and adverse selection.

We begin by explaining the rationale for desiring liquidity – namely, the positive effect of acquiring a liquid firm on the stock of the acquirer. Liquidity differences between target and acquirer affect the liquidity of the combined firm. Acquiring a more liquid firm makes the stock of the acquirer more liquid. An increase of one standard deviation in the target stock's liquidity translates into a 17% increase in the acquirer stock's liquidity.

We then show that liquidity affects the attractiveness of a specific target in comparison to a pool of otherwise identical targets. Public acquirers prefer more liquid targets: the acquirer of a target firm whose stock is one standard deviation more liquid is 27% more likely to be a public firm. Among public firms, more liquid acquirers are more likely to buy more liquid targets. Liquidity is also associated with a greater probability of bid success. Public acquirers are 2.4% more likely to complete a transaction when the target firm's liquidity is one standard deviation higher.

These findings indicate that the liquidity of the target firm's stock plays a key role in the M&A matching process. We argue that this phenomenon is related to the presence of investors who appreciate liquidity. Liquid stocks appeal to specific clienteles. As Uno and Kamiyama (2010) show, more liquid stocks attract shorter-horizon investors. An institutional investor prefers liquid stocks because he frequently needs to rebalance its portfolios to meet redemption claims (for a mutual fund) or capital requirement charges (for an insurance company). In line with this hypothesis, we find that higher institutional ownership predicts the acquisition of a more liquid target, and a greater willingness to pay for the additional liquidity.

Also, although most private acquirers do not value liquidity, some private firms appreciate liquidity more than others. A typical case is that of a firm planning to go public. We find that the acquisition of liquid targets is positively related to the probability of the private firm going public via IPO.

Next, we look at the effect on the price of the deal. In the presence of a public acquirer, one standard deviation increase in the target's stock liquidity corresponds to a 10% higher offer premium, a 2% higher return with respect to a 3-day announcement window and 5% higher return with respect to a 169-day window. In contrast, when the acquirer is private, the coefficient for both the premium and the target announcement returns is significantly smaller than in the case of a public acquirer.

Our results persist in subsamples that exclude toeholds or minor stakes as well as controlling for the choice of the fraction acquired and the means of payment. There is no significant difference between cash- and stock-financed transactions. Also, Gopalan et al. (2012) argue that more liquid assets (as measured by cash holdings) increase stock liquidity because they increase transparency. Acquiring a more liquid firm thus improves the transparency of a less liquid firm, and acquiring a

more transparent firm reduces the dispersion of investor opinion regarding a less transparent buyer (Moeller et al. (2007), Chatterjee et al. (2011)). We therefore explicitly control for cash holding and dispersion of opinion. Finally, we control for linear as well as non-linear size effects. None of the controls change the main results.

Our findings contribute to different strands of literature. First, they relate to the literature on M&As and divestitures (Ritter (1984), Schlingemann et al. (2002), Harford (2005), Officer (2007), Celikyurt et al. (2010), Almeida et al. (2011)), as well as to the one on firm exit decisions: divestitures, the exit of private companies and venture capitalists, and equity placements (Hertzel and Smith (1993), Steiner (1997), Cumming and MacIntosh (2003), Poulsen and Stegemoller (2008), Martos-Vila (2011)). We contribute by showing how market liquidity and firm-specific preferences for target firm liquidity affect M&As.

Second, we relate to the literature on the "optimal way of selling a firm". Zingales (1995) argues that the seller faces a trade-off between the liquidity premium of selling in a public market and the possibility of appropriating synergies by selling the majority stake to a privately owned firm. Bargeron et al. (2008) discuss the choice between public and private acquirers, and Boone and Mulherin (2008) analyze the negotiation or auction process from the target firm's view. We contribute by showing how the selling decision involves a liquidity dimension.

Third, our results are related to the literature studying time-series variations in the demand for corporate assets. In the context of IPOs, Lowry (2003) shows the substantial fluctuation in demand as measured by transaction volume. On the supply side, general economic conditions influence aggregate capital needs; on the demand side, not only the availability of capital and investment opportunities but also the diversification needs of investors follow fluctuating business cycles. Hence, there are periods, or "waves", during which certain investments will command higher

prices (Lee et al. (1991), Harford (2005)). We show that time-varying market-wide liquidity affects acquisition preferences and valuation.

Finally, because we describe the M&A transaction as an event in which firms can gain liquidity, we contribute to the growing literature on the interface between market microstructure and corporate finance. Gopalan et al. (forthcoming) argue that asset liquidity can contribute to stock liquidity, and Ellul and Pagano (2006) link IPO underpricing to after-market liquidity. Stock splits constitute another policy that can heighten investor attention (Baker and Gallagher (1980), Muscarella and Vetsuypens (1996), Mukherji et al. (1997)). Our focus on mergers and acquisitions enables us to study the effect of liquidity on corporate decisions and also on merger valuation.

The paper is structured as follows. In Section II, we lay out the testable hypotheses and the approach we shall follow. Section III describes the data and how we construct an index of liquidity, and in Section IV we demonstrate that target liquidity matters for the subsequently combined firm. In Section V, we assess the effect of liquidity on the acquirer–target matching decision, and Section VI explores the price implications in terms of the premiums and abnormal returns. Section VII discusses why liquidity may be preferred, and Section VIII presents robustness checks. We summarize our findings in a brief conclusion.

II. Hypotheses

In an acquisition, the acquirer buys the target firm and therefore inherits some of the target's characteristics. We argue that one of them is liquidity. The mechanism of this process may be explained in terms of rational as well as behavioral theory.

Rational theory suggests that liquidity is directly related to fundamental characteristics of the firm such as the degree of information asymmetry. In this sense, merging with a less liquid firm

means merging with a firm that is perceived to be less transparent by the market, perhaps because its business is harder to evaluate. This reduces the overall transparency of the firm and therefore lowers its liquidity. For example, if a stable cash flow firm with established technology merges with a high-tech firm with a new technology, the transparency of the former will be negatively affected by the uncertainty about the new technology of the latter. In a related argument, Gopalan et al. (forthcoming) suggest that stock liquidity is also related to the liquidity and information structure of the underlying assets. Using this argument, acquiring a firm with liquid underlying assets would make the combined firm's overall assets more liquid – and increase the liquidity of its stock.

In the case of behavioral theory, this effect would be reinforced if liquidity is also related to investor attention. In economies populated by investors with limited attention, higher demand for stocks to which the market pays attention can generate liquidity and returns that cannot be fully explained by traditional asset pricing models (Merton (1987), Amihud et al. (1999), Hong and Stein (1999), Shapiro (2002), Hirshleifer and Teoh (2003)). Merging with a more liquid firm may put a firm that was not previously considered by the market on the radar screen. This can make the overall new entity more in demand and therefore more liquid.

This effect is drastically reinforced in the case investors evaluate stocks on the basis of some behavioral bias such as "categorical thinking" (e.g., Mullainathan et al. (2008), Barberis and Shleifer (2003)). Categorical thinking is a simplification of Bayesian thinking in which people can only hold a finite set of posteriors rather than every possible posterior (Mullainathan (2002)). People who "think categorically" hold coarser (than rational) beliefs. They condition their choices on a set of categories in which they partition posterior space. They choose in an optimal way, but conditioning "on the category which is most likely given the data." (Mullainathan (2002)).

Investors “merely use the representativeness function instead of the probability function to predict outcomes.” This theory is supported by empirical evidence (e.g., Mullainathan et al. (2008), Barberis and Shleifer (2003), Massa and Zhang (2009)). If investors perceive more visible stocks as belonging to a different category with respect to the less visible ones, they will interpret any signal of the firm (dividend, cash flows, ...) on the basis of the less visible category. This means that any cash flow enhancing policy of the manager will fail to make the firm react in the same way as a more visible firm would do. However, the merger with a visible firm will shift the “category” used by the investors to evaluate the firm and will therefore make the market more reactive to the policies of the manager.

Overall, these considerations suggest that the target firm’s stock liquidity can affect the combined firm’s stock. This is our first hypothesis.

H1: Acquiring a more liquid firm increases the liquidity of the acquirer’s stock.

If this is the case, then liquidity becomes an important variable in the choice of targets. Its value depends on the type of shareholders of the buyer. *Public* shareholders will give a high value to liquidity for two main reasons. First, higher liquidity allows shareholders to trade the stocks more easily, more quickly, and with less price impact. Liquidity thus gives public shareholders the ability to exit without much price impact (Kahn and Winton (1998), Maug (1998)) or to rebalance their portfolios cheaply. The second reason why stockholders value liquidity is that it renders stock prices more informative. Not only does this make it easier to assess the value of future investment opportunities, but it also increases the accuracy of management compensation and hence the alignment of incentives (Scharfstein and Stein (1990), Allen and Gorton (1993), Dow and Gorton (1997)). Both motives are there only for public firms. Indeed, public firms have shareholders who

have self-selected themselves there because presumably value the ability to liquidate their stake. This is not the case for private firms, mostly owned by investors who trade less frequently. They usually own large fractions of the firm and therefore have less need for additional incentive alignment, which suggests that they should be less concerned about liquidity. Also, in private firms, the need of an alignment of incentives between managers and shareholders is lower as the shareholders are more likely to be the managers.

Given the attractiveness of liquidity for public acquirers, liquid target firms should be able to extract a premium, especially if selling to a public acquirer and this should increase the probability of completion of the deal. This leads to our second hypothesis.

H2: Public firms are more likely than private firms to acquire more liquid target firms, to complete acquisitions of more liquid target targets, and to pay a higher premium for more liquid target targets.

The attractiveness of more liquid target firms should depend with time-varying preferences for liquidity. In particular, liquidity may be more important if overall market liquidity is low. Also, attractiveness of liquidity should be related to the characteristics of the investors. Institutional investors who manage their portfolio rotating it regularly have a stronger preference for liquidity because it facilitates turning over a portfolio and selling to accommodate withdrawals without moving the market (Chan and Lakonishok (1995), Falkenstein (1996), Shleifer and Vishny (1997), Gompers and Metrick (2001)). Also, these investors will expecially appreciate the exit option if they hold a big stake. Kyle and Vila (1991) and Maug (1998) argue that liquidity makes it easier to accumulate shares because of the discount associated with the presence of liquidity traders, thus circumventing the Grossman and Hart (1986) paradox. Bolton and Von Thadden (1998a, 1998b),

Kahn and Winton (1998), and Noe (2002) link concentrated shareholdings—and therefore better monitoring—to stock liquidity. Falkenstein (1996) provides empirical evidence of mutual funds' demand for liquidity. This leads us to our last hypothesis:

H3: The effects suggested by H2 are higher in times of low market liquidity and for firms with high institutional ownership.

III. Data and Main Variables

Before looking at our test results, we describe our sample and the variables that will be used.

A. Data

The transactions data come from the Thomson Securities Data Corporation (SDC) M&A database. The base sample contains all completed transactions announced between 1987 and 2007 (inclusive) in which a public firm was sold: 4,691 acquisitions.[1] Information on firm characteristics comes from the Center for Research in Security Prices (CRSP)–Compustat Merged (CCM) database, and we use the CDA/Spectrum Institutional Holdings database for information on institutional ownership. We rely on the SDC equity issuance database for the identification of IPOs.

Following the M&A literature (see, e.g., Chen et al. (2007), Bargeron et al. (2008)), we apply the following filters: (1) we exclude self-tenders and other transactions in which acquirer and target are not distinguishable; (2) we exclude transactions announced on the same date as a share repurchase, and (3) we exclude reverse mergers (i.e., transactions in which the value of acquirer assets did not exceed half of the transaction value). We winsorize all nondiscrete and nontruncated

[1]We exclude incomplete transactions from our analysis because they lack some information we need (e.g., fraction transacted). Our results are unchanged when we repeat the analysis while including incomplete transactions.

variables at the 1% level—except for the market-to-book ratio, which we winsorize at the 5% level because it has more outliers. We consider data at quarterly level when possible and at annual level otherwise.

Table 1 presents summary statistics. The average transaction is worth $303 million. Acquisitions of public firms average 37% of the acquiring firm's value.[2] The average acquirer of a public firm is worth $3,944 million in book value (prior to the acquisition). Of all transactions involving a public acquirer, 35% are paid for with cash, 29% with stock, and the rest with a mixture of both. Of all transactions involving a private acquirer, 71% are paid for with cash and 2% with stock. These statistics are in line with values reported in the literature (e.g., Bargeron et al. (2008)). Panel C and D report the correlation coefficients between transaction and target characteristics, respectively. Note that the transaction characteristics are highly correlated with each other. In the robustness section, we will address potential endogeneity issues.

B. Construction of a Liquidity Index

We use principal component analysis to create a composite quarterly index of liquidity for each firm. We follow Baker and Wurgler (2006) and Bharath et al. (2009). This approach maximizes the informational content and minimizes the potential spurious correlation with variables not related to liquidity. We proceed as follows. First, we identify variables that proxy for liquidity. We normalize these variables by subtracting their mean and then dividing by their standard deviation, which makes them homogeneous in terms of range of variation. Next, we extract the principal

[2] In Section 9, we discuss potential biases due to the choice of the fraction transacted. The results are robust to the exclusion of minority stakes.

components of the normalized variables.[3] We provide a detailed description in the Appendix for a description of all variables.

The variables we use for the *liquidity* index are: *volume*, *turnover*, the illiquidity ratio *Amihud* (based on Amihud (2002)), and the *bid-ask spread*. Each of these six variables is measured as a quarterly average of daily close prices. We define *volume* as the logarithm of the average daily number of shares traded, and *turnover* as the logarithm of volume standardized by the number of shares outstanding. These measures are direct proxies of trading activity and are therefore directly related to liquidity. To measure the price impact of trade, we include the *bid-ask spread* and the *Amihud* (2002) illiquidity ratio. These measures capture the "transaction costs". The bid-ask spread directly measures the transaction cost, while the *Amihud* measures the indirect cost of moving the market as the trade is placed, as the absolute price movement compared to trading volume. More precisely, the *Amihud* ratio aggregates (quarterly) the ratio of daily absolute return to daily dollar trading volume. For stock *i* during quarter *t*, it is:

$$Amihud_{it} = \min\left[\frac{1}{M_{it}}\sum_{d=1}^{M_{it}}\left(\frac{|R_{id}|}{dv_{id}}, \frac{29.75}{0.3C_{t-1}}\right)\right]. \tag{1}$$

Here, R_{id} is the return of stock *i* during day *d*; dv_{id} is stock *i*'s volume in million US dollars – i.e., the number of shares traded during day *d* multiplied by the stock's price at the end of day *d*, M_{it} is the number of valid observations during quarter *t*; and C_{t-1} is the total market capitalization at time $t-1$ divided by the total market capitalization at the end of July 1962. The time-varying upper bound is aimed at avoiding the influence of days for which a stock has both a nonzero return and a very low but positive volume (Acharya and Pedersen (2005)). We control for the correlation

[3] As in Baker and Wurgler (2006), the coefficients are chosen so as to capture the most possible joint variation across the series.

between firm size and the index constituents by including *size,* its logarithm and square in all the regressions.

The first principal component captures a large part of the variation, 51% of the common variation with an eigenvalue of 2.05 (the next one is 1.07). We therefore follow Bharath et al. (2009) in focusing on the first component and ignore the other components. We call it the *liquidity* index supra. Table 2 gives the descriptive statistics and factor loadings of the index.[4] The loadings are of the expected sign. The *liquidity* index increases with the volume measures and decreases with the price impact. The *bid-ask spread* and the *Amihud* lambda enter the index with negative sign whereas *volume* and *turnover* enter with positive sign. The *liquidity* index loads primarily on three of the four illiquidity measures: the bid-ask spread, volume, and turnover.

Panel C of Table 2 presents the correlations between the index and the constituents as well as the market capitalization. As indicated by the factor loadings, the liquidity index is heavily correlated (60-86%) with the *bid-ask spread, volume*, and *turnover*. The correlation with the *Amihud* measure is low. Correlations between the index constituents are low between *Amihud* and all other measures and high among all measures but *Amihud*, ranging from 30% to 76%. Because some of our index constituents can be related to size, we also check for their correlation with the market capitalization. Firm size is correlated particularly with *volume* (29%). Its correlation with the liquidity index is 17%. As reported in Panel D of Table 1, the correlation between *size* and *liquidity* is as high (20%) in the target firm sample. This makes it crucial to control for size subsequently. *Liquidity* is also highly correlated with the *market/book* ratio (30%). Finally, Panel D of Table 1 also shows that within the target firm sample, the liquidity index is highly correlated with institutional and insider ownership, consistent with the argument that institutional owners and

[4] All the measures are de-meaned and then divided by their standard deviation *before* the factorizing procedure.

blockholders prefer more liquid investments. In Section VII, we discuss whether institutional ownership also motivates a more pronounced preference for more liquid acquisitions.

C. Other Variables

We now define a set of variables used to control for the other effects identified by the literature. Given that public firms (when compared with private firms) tend to acquire a higher fraction of the target firm and to pay an overall higher amount for the acquisition, we control for the percentage of the target firm *acquired* and also for the *size* of the target firm (measured as its market value). The inclusion of the *size* control is important also because size is correlated with the liquidity index. Also, to control for a potential nonlinear relationship between liquidity and size, we include the logarithm and the square of size in our set of control variables. We also include the size difference between acquirer and target (and its square) among our control variables. This latter control cannot be used in the specifications that include private acquirers, because size information is not available for private firms.

Chatterjee et al. (2011) describe the effects of dispersion of investor opinion on M&A transactions. Because dispersion of opinion is closely related to information asymmetry and therefore liquidity, it is important to control for it. We use their main dispersion proxy, *idiosyncratic risk*, and measure it according to their definition as the standard deviation of acquirer excess returns on the value-weighted CRSP index. This variable has also been used by others as a measure of asymmetric information (Dierkens (1991)) and of demand elasticity (Wurgler and Zhuravskaya (2002)).

Next, we control for overall activity in the takeover market. We follow Schlingemann et al. (2002) in counting the number of corporate control transactions at the industry level per year.[5] We take the natural logarithm of it and call this measure *# transactions*. We use a measure based on the number of transactions, not on their value, because we want to isolate the price effects of the average transaction values. To control for those, we calculate the average takeover premium per quarter and call it *avg. premium*. Following Harford (2005), we also include an index of economic shocks (*econshock* index)[6] and the *spread* between commercial and industrial loan rates.

Another group of controls are firm characteristics. Poulsen and Stegemoller (2008) argue that target firms with liquidity constraints, firms with high leverage, and less profitable firms prefer public acquirers because they increase access to capital. To control for growth opportunities, we include the *market/book*, the *leverage* ratio, the *return on assets*, and the year-on-year *salesgrowth*. Bargeron et al. (2008) point out that public acquirers might be more lax about agency problems. Therefore, to control for existing agency problems, we incorporate the *cash/assets* ratio into the regression. Cash also increases asset liquidity (Gopalan et al. (forthcoming)); however, shareholders of dividend-paying firms might prefer future dividend payments to a one-time cash payment, leading to a prejudice against private acquirers. Hence we include an indicator variable set equal to 1 if the target firm paid dividends in the previous year (and set equal to 0 otherwise). Targets in more concentrated industries might be more constrained in their choice of acquirer

[5] They include all disclosed and completed leveraged buyouts, tender offers, spin-offs, exchange offers, minority stake purchases, acquisitions of remaining interest, privatizations, and equity carve-outs.

[6] This is the principal component of the following economic shock variables, sorted by industry: net income over sales, asset turnover, research and development (R&D), capital expenditures, employee growth, return on assets (ROA), and sales growth. All market activity indices are measured in the quarter or year of the announcement.

because the number of potential acquirers from the same industry is limited; we therefore include the *Herfindahl* index.

All firm characteristics are defined in the year that ends before the announcement. For the analysis of offer premiums and announcement returns, we include several additional control variables. Because Moeller et al. (2004) argue that size is a major driver of acquisition gains, we control for the *% acquired* in addition to our size controls. We also include the *market/book* ratio, which could affect the announcement returns and offer premiums either because it indicates high growth potential—which could be fostered by a large acquirer's available capital—or because it indicates a high current market valuation (Bargeron et al. (2008)). Leverage and profitability may indicate the potential for synergy from optimizing the combined firm's financial leverage (Harford et al. (2009)); to control for this, we include the target's *leverage* ratio and its *ROA*. Hartzell et al. (2004) show that governance problems can affect target management's willingness to negotiate. We control for potential governance issues using the index of Gompers et al. (2003) and a dummy variable for an insider ownership larger than 5%.

We control for transaction-specific variables, such as the fraction of ownership before the transaction (*% owned before*). To control for the negotiation dynamics (Betton et al. (forthcoming), Boone and Mulherin (2008)), we include dummy variables that indicate *hostile* transactions, *competing acquirers*, *tender offers*, or a *toehold*. Officer (2003) shows that transaction-specific parameters (e.g., termination fees) affect target returns. Therefore, we include an indicator variable for the existence of acquirer or target *termination fees*. Finally, we control for the means of payment because more liquid stock should make it easier to finance with equity. This issue is also addressed in Section VIII, where we separately consider equity- and cash-financed deals.

To address sample selection issues, we adopt a Heckman (1979) specification when focusing on the subsets of public or private acquirers only. In all the specifications, we include year fixed effects. Standard errors are corrected for heteroskedasticity and are clustered at the industry level. Note that our set of control variables differs across specifications because, in regressions from the perspective of the target that depict the choice of the acquirer, we cannot include characteristics of the eventually chosen acquirer. Also, most acquirer characteristics are only available for public firms and so cannot be used to explain a choice between public and private acquirers.

IV. Liquidity as an Acquired Characteristic

In this section, we show how a target's liquidity affects the liquidity of the merged firm. The first hypothesis suggests that acquiring a more liquid firm increases the liquidity of the acquirer. Is target liquidity indeed relevant for the combined firm, or does it disappear after the merger?

To test this hypothesis, we regress the change in the *liquidity* index of the acquirer—the difference between the acquirer's liquidity 12 months after the effective date and 12 months before the announcement date—on the difference between target and acquirer liquidity *prior* to the deal. To improve the readability of coefficients, we rescale the dependent variables into percentage points by multiplying it with 100. If the target's liquidity affects the combined firm's subsequent liquidity, then it should be positively related to the change in the acquirer's liquidity. We control for acquirer liquidity before the transaction, transaction-, acquirer-, and market-specific characteristics (as described in Section III), and the difference between target and acquirer characteristics. To ensure that the effect is driven by liquidity and not by dispersion of opinions, we repeat our analysis controlling for *idiosyncratic risk*. Finally, we identify time-varying

differences by splitting the sample into transactions announced during periods of low versus high market liquidity.

Table 3 reports the results. The change in *liquidity* is significantly related to the liquidity difference between the two parties. One standard deviation higher difference in *liquidity* corresponds to a 17% increase in the acquirer's liquidity. The baseline result is significant and of similar magnitude when we control for *idiosyncratic risk*, in periods of high or low liquidity. These findings are consistent with our hypothesis: target liquidity affects the subsequent liquidity of the combined firm.[7]

V. Acquirer's Value of Liquidity

The main focus of this study is the effect of the expected liquidity "inheritance" on the M&A market. Does demand for liquid target firms differ as a function of the public status and liquidity of potential acquirers? We expect that more liquid target firms are more attractive to public acquirers, holding everything else equal. We begin by testing for a relation between target liquidity and the acquirer being public; then we dig deeper, focusing on public acquirers, and examine how their liquidity affects the choice of target firms.

A. Target Liquidity and Type of Acquirer

First, we relate the probability of the acquirer being public to the target's liquidity estimating a probit model. The dependent variable is an indicator variable set equal to 1 if the acquirer is public (and to 0 otherwise). We include the set of control variables defined in Section III. Note that we

[7] In unreported tests, we also show that the acquisition of a liquid target firm is related to increases in the combined firm's media visibility and investor attention. Greater target liquidity is also associated with lower fees paid and higher amounts raised in subsequent public offerings of equity.

cannot include acquirer characteristics/differences between target and acquirer because the acquirer is yet to be chosen.

Table 4 presents the results. They support our second hypothesis. More liquid target firms are more likely to have public acquirers. Increasing the *liquidity* index by one standard deviation raises by 27% the probability of having a public acquirer. The result is robust also to including the *idiosyncratic risk*. While the coefficient for liquidity is significant at a 1% level in low-liquidity periods, it is only significant at a 10% level in high-liquidity periods. However, the coefficient is not significantly different between transactions announced in times of high versus low liquidity. This suggests that demand for more liquid target firms is marginally lower in times of high market liquidity, as suggested by hypothesis 3.

Among the control variables, the fraction *acquired* has the highest statistical significance: a 5% higher stake in the target firm corresponds to a 10% higher probability that the acquirer is public. We will address the potential endogeneity problems related to this variable in Section VIII. Larger firms are also more likely to be acquired by a public acquirer, consistent with the argument that public acquirers are usually larger themselves and better able to finance larger transactions. The average market acquisition *premium* is positively related to choosing a public acquirer, in line with the findings of Bargeron et al. (2008) that public acquirers pay a higher premium. The *cash/assets* ratio is positively related to the choice of public acquirers. This is consistent with Bargeron et al. (2008), who suggest that public acquirers may be less concerned with agency problems. Finally, there is a significant positive relation between the *% owned before* announcement and the choice of a public acquirer.

B. Target and Acquirer Liquidity

The public status is a rather crude measure of liquidity preferences. If potential acquirers worry about lowering their current liquidity by acquiring a less liquid target, we should expect that more liquid acquirers are also more likely to take over more liquid target firms.

To see this, we repeat the regression presented in the previous section, by replacing the dependent variable – the choice between public acquirers – with the acquirer's liquidity. Because we can only measure liquidity for public acquirers, we have to exclude the private ones and control for the selection of a public acquirer with a Heckman (1979) procedure. Table 5 reports the results. Consistent with the descriptive statistics and in line with our working hypothesis, more liquid acquirers buy more liquid targets. The effect is economically significant. Each unit of target *liquidity* translates into 74% more (of the same unit) *liquidity* of the acquirer. *Idiosyncratic risk* is also associated with higher acquirer liquidity. Since idiosyncratic risk is negatively related to liquidity, this shows that it is important to control for it. The coefficients for *liquidity* do not significantly differ across periods characterized by different degree of market liquidity.

VI. Liquidity and the Transaction

Now we focus on the transaction itself. As we argued (hypothesis 2), if more liquid targets are more attractive, acquirers – especially public acquirers – should have a greater incentive to complete and pay a higher price for them.

A. Transaction Completion

To test whether the preference for liquid firms affects the negotiation process, we regress the probability of completing the transaction on target liquidity separately for private and public

acquirers and then compare the coefficients. For this analysis, we also include in the sample the 2,015 incomplete transactions.[8] We proceed as follows.

First, after dividing the sample between public and private acquirers, we regress an indicator variable for transaction completion separately for both groups on *liquidity* and a set of control variables (as defined in Section III). Note that we cannot control for acquirer characteristics or differences between target and acquirer characteristics because they are not available for private acquirers. We use the method of seemingly unrelated equations (Zellner (1962)) to control for error terms that are correlated across the equations. We then employ a Wald test to check whether the sensitivity to the *liquidity* index statistically differs between the two groups.

Table 6 reports the results. When the acquirer is public (Panel A), there is a significant and positive relation between target liquidity and success of the transaction. One standard deviation increase in target *liquidity* corresponds to a 2.4% higher success rate. In contrast, private acquirers are less likely to complete the acquisition of liquid targets (Panel B). Panel C reports the differences between public and private acquirers. This amounts to a 4.2% higher probability of completion per one standard deviation of liquidity. The difference is statistically significant for all the specifications except in the case of acquisitions announced during high-liquidity times. This is consistent with our hypothesis 3 and suggests that the demand for liquidity is lower in times of high overall liquidity. Then, public acquirers are not only less willing to acquire a more liquid target in general, but also less willing to close the deal once announced.

[8] We exclude incomplete transactions from our main analysis because they do not contain some information that we need (e.g., fraction acquired, premium paid). However, we show in a robustness check that our main results hold also for a sample containing both complete and incomplete transactions.

For a public acquirer, we find that deals are more likely to succeed when the target is larger and has more cash holdings. For both public and private acquirers, there is a positive relation between completion and any previous holding by the acquirer.

B. Target Announcement Returns and Offer Premium

This section analyses the potential value impact of target liquidity. So far, we have found that target liquidity affects demand: public acquirers are more likely than private acquirers to take over more liquid target firms, and they are more willing to complete such takeovers. As we argued above, such a preference should translate into a willingness to pay more for more liquid firms. We test for this possibility by relating both the offer premiums and the target's market returns to liquidity and comparing the relation between transactions involving public acquirers with the corresponding values in transactions involving private acquirers. We construct the offer premium as the SDC transaction value over the target's market value 63 days prior to the announcement. We calculate announcement returns as the cumulative abnormal returns (CAR) over the CRSP value-weighted market index, estimated over 255 trading days prior to the 46th day before the announcement (Schwert (1996)). To make it easier to read the coefficients, we multiply the dependent variables with 100 such that they are in percentage points.

Because we divide the sample into transactions involving a public versus a private acquirer, we must control for selection. For this purpose, we use the Heckman (1979) procedure, as discussed previously. Because calculation of the *average premium* contains the respective *offer premium*, we exclude the former from the first-stage specification (in which *offer premium* is the dependent variable). Our results show only marginal changes when *average premium* is added in the first stage.

Tables 7 and 8 report the results for the offer premium and announcement returns, respectively. We report results on acquisitions by public acquirers in Panels A. They show that offer premiums and announcement returns are both increasing in liquidity. One standard deviation increase in target *liquidity* translates into a 10% higher offer premium, a 2% higher return over the 3-day window, and a 5% higher return over the 169-day window. The magnitude is similar regardless of whether we control for idiosyncratic risk. Contrary to the drop in demand that we found for times of greater market liquidity, the value impact is even greater when market liquidity is high (t = 4.24 for the premium and 3.39 for announcement returns). This suggests that in times of low overall liquidity, acquirers, even if they need it, only afford to pay less for target liquidity.

Panel B of each table reports the results for transactions involving private acquirers, and Panel C reports results of tests for differences between the transactions involving public versus private acquirers. Private acquirers pay a significant premium for more liquid target firms. However, this premium is significantly less than the one paid by public acquirers. This finding supports our hypothesis that public acquirers are willing to pay more than are private acquirers for target firms characterized by high stock liquidity. It is robust to the inclusion of idiosyncratic risk, which has a significantly negative relation with the offer premium, but no significant relation to the announcement returns.

Interestingly, private acquirers do not pay a significant liquidity premium (same for announcement returns) in times of high liquidity. Since these are the times of less demand for liquidity, this result indicates that the liquidity premium paid by private acquirers is driven by potential demand by other public bidders. In contrast, in low-liquidity times, the liquidity premium paid by private acquirers is not significantly different from the one paid by public acquirers. This

is consistent with higher overall demand and bidding activity in such times. We revisit the topic of bidding activity in Section VIII.E.

The transaction-related control variables also display coefficients in line with our expectations. Larger target firms are associated with smaller premiums and returns. Target firms with a higher governance index command higher premiums and returns. These firms have more anti-takeover provisions in place that make it more difficult – and costly – to acquire them. *Hostile* transactions lead to higher premiums and announcement returns, a finding that is also consistent with hostile acquirers paying more to convince the shareholders to sell. In the same spirit, *tender offers* lead to higher target announcement returns. *Termination fees* result in higher premiums and announcement returns. Stock-financed acquisitions are significantly negatively related to the premium in most specifications.

In sum, this evidence is consistent with our hypothesis (H2) that acquirers are willing to pay a premium for more liquid target firms, particularly public acquirers. Offer premiums and announcement returns are both increasing in the target's liquidity, especially so if the acquirer is public. The difference in the liquidity premium between public and private acquirer is particularly pronounced during times of low demand for liquidity.

VII. Determinants of the Liquidity Preference

In this section, we focus on the cases in which the marginal value of liquidity is likely to be higher. As we argued, liquidity should particularly be appreciated by firms with a high institutional ownership as well as by firms seeking to raise equity and planning to go public. We will discuss each of these incentives in turn.

A. Institutional Shareholders

Institutional shareholders prefer more liquid stocks (Falkenstein (1996)), as they value the possibility of faster and cheaper exit. This should also affect their preferences in the context of acquisitions: we expect that the previous results (the likelihood of acquiring and the willingness to pay for a more liquid target) are stronger if the acquirer is owned by a higher fraction of institutions.

We begin with an analysis of the preferences of institutional investors. In Table 9, Panel A, we present an investigation of the propensity to acquire a very liquid target (target firm's liquidity is above the median), including the control variables described in Section III. As hypothesized, institutional shareholders are associated with high-liquidity targets. Firms with one standard deviation (27%) higher *institutional ownership* are 17% times more likely to acquire highly liquid targets. In line with the other results, the effect is concentrated in times of low liquidity.

Next, we repeat the analysis regarding deal completion and premium focusing on three subsamples: public acquirers with *institutional ownership* lower than 5%, between 5% and 25%, higher than 25%. As expected, institutional owners drive the tendency to complete acquisitions with liquid targets (Panel B). The coefficient for *liquidity* is positive and significant for acquirers with high *institutional ownership*, but negative for those with medium or low/no *institutional ownership*. These findings suggest that institutional shareholders have a preference for liquid targets. We see a similar pattern with the offer premium (Panel C). An acquirer with either high or medium *institutional ownership* is willing to pay a higher premium for more liquid target firms. One standard deviation increase in target *liquidity* translates into a 7.3% (respectively, 5.5% and 5.0%) higher premium for firms with *institutional ownership* above 25% (respectively, 5%–25% and below 5%).

These results suggest that institutional investors show a higher preference for target liquidity than other investors, while the results on completion and offer premium even suggest that institutional shareholders are the main driving forces behind the willingness to complete and pay a premium for transactions involving more liquid target firms.

B. Going Public

So far, we have argued that shareholders of private firms have less need for an exit option than do shareholders of public firms. However, this is not necessarily true for all private firms. In particular, any private firm that intends to go public via an IPO is likely to care more about liquidity than otherwise comparable private firms.

To test this hypothesis, *w*e examine whether acquiring a liquid target has any relation to the likelihood or speed of the firm going public after that acquisition. We identify all private firms that make an acquisition (of either public or private targets) and then track whether they go public within the next five years.[9] This yields a sample of 6,965 firm-years for all private acquirers and 970 firm-years for those that go public.

Panel A of Table 10 gives summary statistics. On average, firms in this sample made 2.29 acquisitions per year that were worth $382 million. The average transaction size is $167 million, much smaller compared to the $396 million average transaction size in our baseline sample of acquisitions (as of Table 1). Of the private acquirers' transactions, 64% involve a public target firm. This sample therefore differs sharply from our main sample, which was restricted to public target firms. Although this sample is larger, the set of target firm characteristics for which we can

[9] To exclude reverse mergers, we delete all observations for which the target firm (i) is still publicly listed one year after the effective date *and* (ii) has increased its market capitalization by more than 50% between the announcement date and one year after the effective date.

control is smaller because some of them are not available for much of the sample. Also, the subsample of IPO firms made fewer acquisitions (1.93 annually, on average) and spent slightly less on them, with an average annual value of $348 million. The average *IPO proceeds* were $224 million.

To find out whether acquiring a liquid firm affects the likelihood and speed of going public, we regress the IPO decision on target liquidity. We use industry (rather than target) liquidity because individual information is not available for most target firms. We weight the target's Industry liquidity by the respective acquisition value to ensure that larger targets receive a greater weight than series of small acquisitions.

Panel B of Table 10 reports the results. Acquiring a more liquid target firm is associated with a greater likelihood of going public. This finding is robust to whether we count acquisitions during the prior five, four, three, or two years or only in the previous year. Moreover, it is significant both for the sample of all private acquirers and (in most of the specifications) for the subsample of all private acquirers that make an IPO afterwards ("IPO firms"). In the sample of all private acquirers, one standard deviation of target liquidity makes the acquirer 55% more likely to go public in the subsequent year. This result is robust to restricting the sample to IPO firms only. In that case, one standard deviation of target liquidity increases by 18% the acquirer's likelihood of going public in the next year. Overall, these findings indicate that not all private firms are indifferent to liquidity. Private firms that acquire liquid targets are more likely than other private firms to go public in the subsequent years.

VIII. Robustness

We now consider some robustness checks.

A. The Fraction Transacted

It is easier to buy a large fraction of very liquid stock than a large fraction of an illiquid stock. The fraction acquired, in turn, may affect how much liquidity is transferred from the target. This raises the issue of whether our results on the preference for liquidity are driven by this relation. We therefore explicitly control for the fraction that is acquired. In doing this, we employ two alternative methodologies: a selection model (á la Heckman (1979)) and a two-stage simultaneous approach.

In the Heckman specification, we model the choice of the fraction exchanged in the first stage and adjust for selection bias in the second. We set a dummy variable equal to 1 if the target sells a significant stake (and to 0 otherwise). We define "significant stake" in terms of four different thresholds: a stake exceeding 20%, 25%, 40%, or 50%. In the interest of brevity, we only report the results based on the 50% stake. However, other thresholds provide the same results, suggesting that our results are not sensitive to the size threshold used. In the first stage, we run a probit regression for our dummy on liquidity and the set of control variables described previously (see Panel A of Table 11). We find that the relation between *liquidity* and *% acquired* is not significant.

In the second stage, we repeat our main regressions for the transactions in which a significant stake % is acquired. To control for selection bias, we compute the inverse Mills ratio of the preceding probit regression and include it in these regressions. The results confirm our previous findings. Target *liquidity* is significantly positively related to the choice of a public acquirer and the offer premium.

As a further robustness check, we perform a simultaneous two-stage regression. In this specification we control for the fraction acquired as a continuous variable that is censored at 0 and 1. This allows us to control for effects of the *% acquired* beyond the 50% control threshold of

the first specification. We instrument the fraction acquired with the *Herfindahl* index and the *econshock* variable of Harford (2005). These variables—which proxy for market structure and economic conditions—are significant for the choice of the fraction sold but irrelevant to the choice of acquirer type (public versus private) in most specifications. We report the results in Panel B. They confirm the previous ones. All our results are robust to the instrumented two-stage regression. As before, the coefficients for the index of *liquidity* are significantly positive in the second stage. The *F*-test statistic of 17.56 indicates that the instruments are not weak (Staiger and Stock (1997)).[10]

B. Toeholds

Another concern are toeholds. It is easier to acquire a toehold with a liquid target, which in turn makes it easier to ultimately gain ownership (Betton and Eckbo (2000)). That could be one reason why bidders prefer more liquid targets. On the other hand, acquirers may foresee difficulties in acquiring an illiquid firm and for that very reason start with a toehold first. To control for these possible forces, we repeat our main analysis on the subsample without a toehold. To control for selection, we employ a Heckman (1979) specification similar to the one described in Section A. We model the choice of a toehold as the first stage and adjust for selection bias in the second stage.

In the first stage, we use a probit regression in which we regress an indicator variable for *toehold* on *liquidity* and the control variables already described (Panel C of Table 11). The relation

[10] For transactions of minority stakes, we test for whether the results depend on the trading status of the target after the transaction. The results (available upon request) are similar in the two subsamples consisting of acquisitions after which the target firm either *ceased* or *continued* trading in the year after the transaction was completed.

between *liquidity* and *toehold* is significantly negative. It seems that acquirers do not acquire a toehold when it is easy to do so, but rather to pre-empt takeovers of less liquid firms.

In the second stage, we repeat our main regressions for the transactions without a toehold. The results are similar to our base results. Even for transactions without a toehold, target *liquidity* is positively related to the acquirer being public and also to the premium paid.

C. Payment Method

When the means of payment is equity the new shareholder base will contain previous shareholders of both the acquirer and of the target (Faccio and Masulis (2005)). If liquidity is a function of ownership, then stock-paid transactions may mechanically retain more of the target firm's liquidity. But if liquidity is primarily a function of fundamental firm characteristics, then liquidity retention should differ less across financing methods. To see which effect dominates, we compare the relation between target and post-transaction liquidity within two subsamples: stock-financed deals and cash-financed deals.

In Panel D of Table 11, we present the results on the subsequent liquidity and the choice between public and private acquirers for an all-*cash* sample of 368 public acquirers (2,944 target firms). In Panel E, we present results on the same choice for an all-*stock* sample of 430 public acquirers (644 target firms). We control for dispersion in columns 2 and 4. For the regression of subsequent liquidity, we report the coefficients for the target firm's liquidity in excess of the acquirer's.

The results do not differ from subsamples based on the payment method. As for the base sample, target liquidity is positively related to the consolidated firms' liquidity, the choice of acquirer public status, and the offer premium in both subsamples. The *t*-statistic of difference

between the two subsamples is 0.63, 0.02, and 0.12, respectively. This indicates that the liquidity transfer is not mechanical and driven by stock paid deals.

D. Incomplete Transactions

Panel F of Table 11 reports results on the choice between public and private acquirers for *all* (i.e., including those not completed) 6,706 transactions and on the choice of target liquidity for *all* 1,476 transactions with a public acquirer. Our main results remain unchanged. The choice of acquirer public status as well as the offer premium is significantly increasing in liquidity.

E. Contested Transactions

The "choice" between private and public acquirers may be driven by the availability of either. Bidding contests between public and private acquirers provide a setting in which we can isolate the choice between public and private acquirers from their availability. SDC provides data on 312 such transactions (as reported in Panel G of Table 11). Consistent with our base results, target liquidity changes bidder behavior. Target firms with liquidity above median, while not with significantly more bids in general, attract significantly more bids from public bidders. On average, 71% of all bids received by a liquid target are from a public firm (versus 46% for less liquid targets). We observe the same pattern with bid outcomes: of the contests for a more liquid target, 65% conclude with acquisition by a public firm (versus 34% for less liquid targets). Contests for more liquid targets also have a greater probability of success, 57% versus 37% for less liquid targets. In short, the results are in line with our general findings. More liquid targets attract more bids from public than from private firms, public firms more often win the contest and become the acquirer, and the transaction is more likely to be concluded.

IX. Conclusion

We study the impact of stock liquidity in the market for corporate control. We argue that the liquidity of the target's stock is appreciated differently by public and private acquirers. The shareholders of public firms—likely institutional and professional investors—value the option to liquidate their position swiftly and without adverse effects on the price. Hence we claim that, everything else equal, (i) transactions are more attractive for public shareholders if the liquidity of the target's stock does not adversely affect their own stock's liquidity or, even better, actually increases it; and (ii) such shareholders are willing to pay more for "liquid" targets. These considerations argue for both a higher target premium and a greater likelihood of the bid's success, since liquid targets profit more when acquired by public than by private firms.

We test these hypotheses with reference to the US M&A market for the period 1987–2007. We first show that differences in the degree of liquidity between the target and the acquirer affect the liquidity of the consolidated firm. Acquiring a more liquid target renders the acquirer's stock more liquid and also affects other firm characteristics associated with liquidity. We document that liquidity affects the acquirer's choice: public acquirers—and especially the more liquid ones—are more likely to choose more liquid targets, all else equal. Public acquirers are also more likely to complete a transaction if the target firm is more liquid. These effects are more pronounced in times of overall low market liquidity, indicating that the demand for liquidity is time-varying.

These findings have implications for the price of the deal. We show that—in the presence of a public acquirer—greater target liquidity is related to a higher offer premium and target announcement return. Public acquirers are also willing to pay more than private acquirers for a more liquid target, in terms of both the premium and the target announcement returns.

We argue that these patterns are related to the presence of institutional investors. A greater proportion of institutions among the acquirer's shareholders is associated with increased odds of acquiring firms whose liquidity is above the median.

Although most private acquirers value liquidity less than do public firms, some private firms appreciate liquidity more than others. A typical case is a firm planning to go public. Indeed, we find that acquiring liquid targets is positively related to the private firm's likelihood of going public.

Our findings also have implications for the optimal way of selling a firm (Zingales (1995)) in that they show how stock liquidity drives the choice of sell-off form (public versus private) and thereby the "matching of firms" in the market. These results imply that the choice between a public versus private acquirer can be directly related to market fluctuations—not only because of valuation but also because the desired level of liquidity (and hence its value) fluctuates over time. As a consequence, investors are more willing to pay more for certain investment types in certain periods (Harford (2005)).

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Appendix: Definition of Variables

Variable	Definition
# acquisitions	Count of acquisitions made by an acquirer.
# institutional shareholders	Count of institutions who report (in their 13f filing) that they hold shares of the focal firm.
# public acquisitions	Count of acquisitions involving public target firms made by the focal acquirer.
# transactions (period)	The logarithm of the number of corporate control transactions at the industry level in the year before the transaction. Corporate control transactions include all disclosed and completed leveraged buyouts, tender offers, spinoffs, exchange offers, minority stake purchases, acquisitions of remaining interest, privatizations, and equity carve-outs. Buybacks are excluded from the sample. Reported in '000s for scaling reasons.
% acquired	Fraction of the target firm exchanged in the transaction.
% owned after	Fraction of the target firm owned by the acquiring firm after the transaction.
% owned before	Fraction of the target firm owned by the acquiring firm before the transaction.
acquirer public	Indicator set equal to 1 if the acquirer is listed on a stock exchange.
acquisition value	Sum of values of the transactions made by an acquirer.
all cash	Indicator set equal to 1 if the transaction is completely paid in cash.
all stock	Indicator set equal to 1 if the transaction is completely paid in stock.
Amihud	Illiquidity ratio from Amihud (2002); see equation (1) for details.
assets	The book value of the target firm (in million US dollars). Square assets is reported in billions for scaling reasons.
avg. premium	Average takeover premium across all acquisitions per quarter, where "premium" is the transaction value less the target's market value (63 days prior to announcement) *divided by* the latter.
bid-ask spread	Difference between the bid and the ask price *divided by* the close price.
cash/assets	The fraction of the cash over book assets (percentage).
competing bidders	Indicator set equal to 1 if a third party launched an offer for the target while the

	original bid was pending (and to 0 otherwise).
dividend payer	Indicator set equal to 1 if a firm pays dividends in the previous year.
econshock	Principal component of the following economic shock variables, sorted by industry: net income over sales, asset turnover, R&D expenditures, capital expenditures, employee growth, ROA, and sales growth.
Governance index	Index of Gompers et al. (2003).
Herfindahl	Herfindahl index by sales.
hostile	Indicator set equal to 1 if the board officially rejects the offer yet the acquirer persists with the takeover (and to 0 otherwise).
idiosyncratic risk	Standard deviation of the acquirer excess returns on the value-weighted market return, measured over a quarter.
insider ownership	Indicator set equal to 1 if more than 5% of the firm's shares are held by insiders who must file SEC form 3, 4, 5, or 144.
institutional ownership	Fraction of ownership by institutions who file SEC form 13F.
IPO proceeds	Total proceeds of IPO (in million US dollars).
leverage	Ratio of net debt to assets.
liquidity index	First principal component of the quarterly average of the bid-ask spread, log of volume, log of turnover, and the Amihud illiquidity ratio—all measured per trading day. For this index, all measures are normalized by subtracting their mean and then dividing by their standard deviation.
log assets	Natural logarithm of book assets.
log market value	Natural logarithm of market value measured 63 days prior to the transaction.
market cap ($)	Closing price multiplied by the number of shares outstanding.
market/book	Market value of equity plus book value of assets minus book value of equity *divided by* book value of assets.
Mills public	Inverse Mills ratio computed with the regression shown in Table 4, Column 1.
public acquisitions	For a given firm, the ratio of public acquisitions to all acquisitions (%).

relative size	The ratio between target and acquirer assets. Reported x 10^3 for scaling reasons. Square relative size is reported x 10^6 for scaling reasons.
R&D/sales	Ratio of R&D expenses to sales.
R&D	Indicator set equal to 0 if R&D expenses are missing or set equal to 1 otherwise.
ROA	Earnings (before interest and taxes) divided by assets.
salesgrowth	Year-on-year growth in sales, reported in '000s for scaling reasons.
size	The target firm's market value (in million US dollars). Square size is reported in quadrillions for scaling reasons.
spread	Credit spread between commercial and industrial loan rates.
tender offer	Indicator set equal to 1 when a tender offer is launched for the target (and to 0 otherwise), where "tender offer" is defined as a formal offer (of specific duration) made to the target's equity holders to acquire their shares.
termination fees	Indicator set equal to 1 only if the parties have made a termination fee agreement whereby failure to consummate the transaction results in a payment made by one party to the other.
toehold	Indicator set equal to 1 if the acquirer owns more than 0.5% of the target prior to the transaction.
transaction value	Total value of consideration paid by the acquirer (in million US dollars), excluding fees and expenses. Includes the amount paid for all common stock (equivalents), preferred stock, debt, options, assets, warrants, and stake purchases made within six months of the transaction's announcement date. Assumed liabilities are included in the value if disclosed; preferred stock only if acquired as part of a 100% acquisition. Common stock is valued based on the closing price on the last full trading day prior to announcement or alteration date of the stock swap terms.
turnover	Logarithm of (trading volume divided by the number of shares outstanding).
volume	Logarithm of trading volume.

Table 1
Descriptive statistics: Transactions

This table provides summary statistics for the baseline sample of completed transactions involving a public target firm and announced during 1987–2007. Panel A (C) gives (correlations of) transaction and market characteristics; Panel B (D) gives characteristics (correlations) of the acquirer and the target firm in the last year that ends before the announcement. Values reported in Panel A and B are means, with medians in brackets, and before taking logarithms.

Panel A. Transaction and market characteristics

Variable	All transactions		Acquirer public status: Private		Acquirer public status: Public	
Acquirer public	36.40%		0.00%		100.00%	
Transaction value (in USD millions)	302.77	[14.06]	102.51	[4.99]	621.72	[112.12]
% acquired	36.90%	[10.87%]	17.75%	[5.89%]	70.35%	[100.00%]
% owned after	42.19%	[18.21%]	23.37%	[9.40%]	75.07%	[100.00%]
All cash	57.57%		70.60%		34.82%	
All stock	11.93%		1.88%		29.49%	
Tender offer	5.47%		2.28%		11.06%	
Termination fees	17.42%		4.99%		39.15%	
Toehold	34.85%		46.12%		15.16%	
# transactions (period)	474	[314]	406	[269]	593	[437]
Avg. premium	4.83%	[3.83%]	4.78%	[3.76%]	4.92%	[4.07%]
Econshock	0.23	[0.12]	0.15	[0.07]	0.37	[0.24]
Spread	5.58%	[5.55%]	5.71%	[5.60%]	5.36%	[5.39%]

Panel B. Target and acquirer characteristics

Variable	Target: All transactions		Target: By a private acquirer		Target: By a public acquirer		Acquirer	
Assets (in USD millions)	1354	[163]	1192	[149]	1637	[185]	3944	[2,260]
Market cap ($)	4,122,252	[330,126]	713,786	[204,461]	10,200,000	[1,002,235]	20,700,000	[1,829,587]
Market/book	3.50	[1.78]	3.17	[1.61]	4.07	[2.12]	4.87	[2.37]
ROA	6.99%	[1.62%]	6.81%	[8.88%]	7.32%	[9.49%]	1.10%	[3.26%]
Leverage	33.98%	[38.88%]	34.26%	[39.46%]	33.48%	[36.32%]	32.23%	[31.29%]
Institutional ownership	25.61%	[18.20%]	23.27%	[15.76%]	28.95%	[21.78%]	25.77%	[21.90%]
Insider ownership	9.30%	[0]	5.80%	[0]	17.46%	[0]	3.35%	[0]
Governance index	9.05	[9]	8.95	[9]	8.92	[9]	8.84	[9]
Liquidity index	0.26	[0.23]	0.01	[0.15]	0.82	[0.37]	0.76	[0.42]
Bid-ask spread	3.45%	[2%]	4.21%	[3%]	2.24%	[1%]	1.74%	[1%]
Volume	622,595	[59,244]	253,490	[41,368]	1,276,394	[156,243]	2,428,454	[213,373]
Turnover	6.75	[3.86]	6.43	[3.67]	7.32	[4.25]	6.90	[3.94]
Amihud	0.28	[0.00]	0.36	[0.00]	0.13	[0.00]	0.05	[0.00]
Idiosyncratic Risk	0.26%	[0.11%]	0.27%	[0.12%]	0.26%	[0.10%]	0.10%	[0.40%]

Panel C. Correlation matrix - transaction and market characteristics

	Liquidity	Acquirer public	Transaction value	% acquired	% owned after	All cash	All stock	Tender offer	Termination fees	Toehold	# transactions (period)	Avg. premium	Econshock
Acquirer public	24%												
Transaction value	26%	23%											
% acquired	17%	68%	31%										
% owned after	14%	68%	30%	96%									
All cash	-7%	-42%	-16%	-41%	-38%								
All stock	7%	44%	15%	55%	53%	-48%							
Tender offer	9%	18%	6%	19%	23%	17%	-9%						
Termination fees	23%	46%	31%	65%	62%	-21%	30%	23%					
Toehold	-20%	-41%	-16%	-54%	-40%	41%	-28%	-7%	-33%				
# transactions (period)	10%	19%	3%	23%	21%	-9%	22%	1%	14%	-13%			
Avg. premium	8%	4%	2%	2%	2%	3%	-1%	5%	3%	-2%	6%		
Econshock	17%	12%	15%	19%	18%	-5%	4%	-3%	18%	-12%	15%	5%	
Spread	-30%	-19%	-16%	-27%	-26%	8%	-6%	-8%	-29%	21%	-19%	-2%	-38%

Panel D. Correlation matrix - target characteristics

	Liquidity	Size	Market/ book	ROA	Leverage	Cash/ assets	Sales-growth	Institutional ownership	Insider ownership	Governance index
Size	20%									
Market/book	30%	9%								
ROA	7%	5%	-14%							
Leverage	-23%	-3%	-9%	19%						
Cash/assets	13%	-3%	9%	4%	-6%					
salesgrowth	4%	-1%	-2%	3%	0%	-1%				
Institutional ownership	41%	12%	6%	31%	-5%	10%	-3%			
Insider ownership	43%	20%	16%	24%	-1%	13%	-4%	41%		
Governance index	33%	24%	10%	21%	4%	9%	-7%	43%	55%	
Idiosyncratic risk	-3%	-6%	10%	-19%	-7%	0%	0%	-16%	-10%	-11%

Table 2
Descriptive statistics: Indices

This table provides summary statistics for the constituents of the *liquidity* index and its principal component loadings. The sample includes all Compustat firms with valid observations in the sample period. Panel A reports average characteristics; Panel B reports the means and medians (before taking logarithms and standardization) and principal component loadings of the constituents of the *liquidity* index. In the index, all measures are normalized by subtracting their mean and then dividing by their standard deviation. Reported values are means, with medians in brackets. Panel C reports correlations (without transformations).

Variable	Observations	Mean	Median	Principal component loadings
Panel A. Firm characteristics				
Assets (in USD millions)	661,408	1,388	[155]	
Market/book	751,925	1.48	[1.48]	
Panel B. Liquidity measures				
Bid-ask spread	401,488	3.66%	[2.20%]	-0.33
Volume	506,952	283,883	[29,806]	0.43
Turnover	506,952	5.11	[2.60]	0.42
Amihud	534,165	1.98	[0.00]	-0.13

Panel C. Correlation matrix

Variable	Liquidity index	Bid-ask spread	Volume	Turnover	Illiquidity
Bid-ask spread	-67.44%				
Volume	86.33%	-38.82%			
Turnover	83.00%	-32.29%	76.26%		
Amihud	-0.12%	4.82%	-0.03%	-0.03%	
Market cap	17.25%	-8.50%	28.53%	4.79%	-0.45%

Table 3
Effects of target liquidity on the combined firm

This table reports results of cross-sectional regressions. The dependent variable is the change from the quarter 12 months before the transaction's announcement to the quarter 12 months after its effective date for *liquidity*, in percentage points. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Dependent variable = change in liquidity

	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period
Liquidity difference (target - acquirer)	30.982***	31.140***	29.306***	38.886***
	(7.531)	(7.554)	(5.48)	(4.478)
Liquidity (acquirer)	0.452	0.675	3.009	-7.494
	(0.176)	(0.257)	(0.899)	(-1.261)
Relative size	-9614.415	-9636.708	-9348.645*	-12100
	(-1.811)	(-1.806)	(-2.056)	(-1.018)
(Relative size)^2	0	0	0	0
	(.)	(.)	(.)	(.)
Idiosyncratic risk (acquirer)		-640.432		
		(-0.77)		
% acquired	-0.623	-0.596	-1.973	8.761
	(-0.213)	(-0.206)	(-0.565)	(1.054)
Log # transactions (period)	-586.782	-399.141	4350.252	2640.289
	(-0.115)	(-0.078)	(0.777)	(0.109)
Avg. premium	22.433*	22.769*	26.393*	15.33
	(2.427)	(2.475)	(2.208)	(1.149)
Econshock	-5.908	-5.953	-13.740*	0.228
	(-1.525)	(-1.521)	(-2.499)	(0.031)
Spread	-3.615	-7.242	607.881	-1076.874
	(-0.01)	(-0.019)	(1.673)	(-0.811)
Log assets (acquirer)	2.036	1.737	1.914	5.565
	(1.455)	(1.137)	(1.024)	(1.305)
Assets^2 (acquirer)	-14.649	-13.126	9.167	-134.168
	(-0.36)	(-0.316)	(0.135)	(-1.181)
Market/book (acquirer)	-1.222***	-1.208***	-1.162*	-0.841
	(-3.832)	(-3.734)	(-2.426)	(-1.926)
Leverage (acquirer)	-10.343	-10.148	-7.554	-13.659
	(-1.414)	(-1.384)	(-0.764)	(-0.961)
ROA (acquirer)	14.105	11.638	19.08	-14.801
	(1.213)	(1.101)	(1.393)	(-0.442)
Cash/assets (target)	2.138	2.142	-0.101	6.491
	(0.476)	(0.481)	(-0.013)	(1.362)
Market/book (target-acquirer)	-0.464	-0.455	0.162	-0.863
	(-0.662)	(-0.65)	(0.192)	(-0.613)
Leverage (target-acquirer)	1.936	1.925	9.516	-15.461
	(0.199)	(0.198)	(0.946)	(-0.721)
ROA (target-acquirer)	-14.734	-15.255	-11.563	-33.11
	(-1.568)	(-1.66)	(-1.026)	(-1.979)
Cash/assets (target-acquirer)	-0.167	-0.17	-0.109	-0.362
	(-1.065)	(-1.08)	(-0.56)	(-1.295)
Constant	-33.308	-30.608	-81.733	-109.788
	(-0.898)	(-0.83)	(-1.585)	(-0.654)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
R-squared	26.2%	26.2%	32.0%	31.2%
N	1,033	1,033	691	342

Table 4
Choice between public and private acquirers

This table presents results of regressions in which the dependent variable is the acquirer's public status. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Dependent variable = acquirer public status

	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period
Liquidity (target)	0.200***	0.201***	0.183***	0.219
	(4.416)	(4.41)	(3.638)	(1.95)
Idiosyncratic risk (target)		5.307		
		(0.611)		
% acquired	2.021***	2.020***	2.172***	1.578***
	(24.016)	(23.969)	(23.27)	(11.624)
Size (target)	0.039**	0.037*	0.057**	-0.008
	(2.595)	(2.541)	(3.011)	(-0.28)
Log size (target)	0.093***	0.096***	0.093**	0.110*
	(3.864)	(4.117)	(3.196)	(2.155)
Size^2 (target)	-1.043**	-1.017**	-1.595***	0.278
	(-3.224)	(-3.183)	(-3.592)	(0.424)
Log # transactions (period)	-3.75	-5.022	31.513	97.693
	(-0.047)	(-0.063)	(0.308)	(0.654)
Avg. premium	0.026***	0.026***	0.015	0.040**
	(4.857)	(4.624)	(1.661)	(2.884)
Econshock	0.229	0.23	0.257	0.072
	(1.4)	(1.408)	(1.078)	(0.243)
Spread	0.188	0.187	0.117	0.199
	(1.924)	(1.918)	(1.031)	(1.29)
Market/book (target)	2.497	2.384	3.977	-3.209
	(0.368)	(0.351)	(0.544)	(-0.154)
Leverage (target)	0.021	0.021	0.053	-0.042
	(0.268)	(0.26)	(0.629)	(-0.282)
ROA (target)	-0.037	-0.022	0.018	-0.235
	(-0.416)	(-0.26)	(0.138)	(-1.227)
Cash/assets (target)	15.454**	15.462**	21.387***	9.845
	(2.811)	(2.802)	(4.353)	(1.533)
Salesgrowth (target)	-10.758	-10.771	-15.639*	12.128
	(-1.379)	(-1.378)	(-2.008)	(0.624)
Dividend payer dummy	0.1	0.102	0.074	0.079
	(1.494)	(1.512)	(1.021)	(0.606)
Herfindahl	-0.146	-0.144	-0.062	-0.45
	(-0.692)	(-0.676)	(-0.229)	(-0.87)
% owned before	1.381***	1.380***	1.489***	1.117***
	(6.55)	(6.525)	(5.431)	(3.667)
Constant	-4.238***	-4.267***	-4.008***	-3.749**
	(-5.521)	(-5.544)	(-4.976)	(-2.612)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
N	4,691	4,691	3,372	1,319

Table 5
Choice between high- and low-liquidity acquirers

This table reports results of regressions in which the dependent variable is acquirer *liquidity*. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Dependent variable = acquirer liquidity

	(1)	(2) Dispersion control	(3) Low liquidity period	(4) High liquidity period
Liquidity (target)	0.742***	0.743***	0.843***	0.702***
	(14.35)	(14.523)	(14.297)	(11.085)
Idiosyncratic risk (target)		14.713*		
		(1.993)		
% acquired	0.038	0.037	0.136	-0.041
	(0.664)	(0.635)	(1.879)	(-0.65)
Size (target)	-0.007	-0.01	-0.003	-0.013
	(-0.742)	(-1.103)	(-0.298)	(-0.822)
Log size (target)	0.022	0.027	0.006	0.037
	(1.557)	(1.948)	(0.363)	(1.804)
Size^2 (target)	0.117	0.172	0.094	0.202
	(0.556)	(0.847)	(0.443)	(0.521)
Log # transactions (period)	-34.983	-38.548	50.589	-38.335
	(-0.903)	(-0.992)	(0.782)	(-0.645)
Avg. premium	0.01	0.009	0.005	0.009
	(1.788)	(1.738)	(0.779)	(1.323)
Econshock	0.045	0.041	-0.229	0.026
	(0.657)	(0.59)	(-1.67)	(0.359)
Spread	0.034	0.029	0.046	-0.009
	(0.925)	(0.789)	(0.912)	(-0.138)
Market/book (target)	-9.085*	-8.577	-11.175	-6.186
	(-2.068)	(-1.921)	(-1.563)	(-1.226)
Leverage (target)	-0.036	-0.036	0.096	-0.113
	(-0.465)	(-0.467)	(1.479)	(-1.019)
ROA (target)	-0.009	0.041	-0.182	-0.027
	(-0.054)	(0.274)	(-0.595)	(-0.108)
Cash/assets (target)	0.055*	0.05*	0.050*	0.013
	(2.109)	(1.996)	(2.414)	(0.181)
Salesgrowth (target)	-0.582	-0.296	-1.599	0.47
	(-0.144)	(-0.072)	(-0.197)	(0.113)
Dividend payer dummy	-0.047	-0.036	-0.073	-0.037
	(-0.982)	(-0.774)	(-1.322)	(-0.619)
Herfindahl	-0.188	-0.167	-0.312	-0.267
	(-0.69)	(-0.586)	(-0.602)	(-0.875)
% owned before	-0.053	-0.048	0.104	-0.216
	(-0.347)	(-0.311)	(0.83)	(-1.172)
Mills Public	0.063	0.032	-0.011	0.049
	(0.865)	(0.447)	(-0.125)	(0.492)
Constant	-2.065***	-2.127***	0.685	0.125
	(-4.163)	(-4.203)	(1.12)	(0.209)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
R-squared	72%	73%	79%	69%
N	1,083	1,083	380	703

Table 6
Deal completion

This table presents regression results, where the dependent variable equals 1 if the transaction is completed successfully, using an extended sample of complete and incomplete transactions. Panel A (resp., Panel B) reports the results for the subsample of transactions with a public (resp., private) acquirer. Panel C reports on tests of differences between coefficients for the regressions reported in Panel A and those reported in Panel B, with chi-square statistics given in parentheses. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Panel A. Acquisition by a public acquirer. Dependent variable = success

	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period
Liquidity	0.028**	0.029**	0.029*	0.017
	(2.739)	(2.834)	(2.566)	(0.677)
Idiosyncratic risk		-6.016***		
		(-3.473)		
Size	0.009*	0.011*	0.016**	-0.01
	(1.978)	(2.488)	(3.151)	(-1.221)
Log size	0.028***	0.022***	0.021**	0.054***
	(4.734)	(3.513)	(3.159)	(4.097)
Size^2	-0.186	-0.232*	-0.376**	0.225
	(-1.79)	(-2.211)	(-3.001)	(1.143)
# transactions (period)	-25.796	-23.133	-22.173	-33.362
	(-1.432)	(-1.283)	(-1.034)	(-0.66)
Market/book (target)	0.006***	0.006***	0.005*	0.007
	(3.394)	(3.664)	(2.356)	(1.89)
Avg. premium	0.076*	0.079*	0.038	0.203**
	(2.187)	(2.274)	(0.966)	(2.618)
Econshock	0.047*	0.046*	0.021	0.052
	(2.397)	(2.375)	(0.854)	(1.352)
Spread	1.214	1.115	2.16	-2.739
	(0.647)	(0.595)	(1.064)	(-0.454)
Leverage (target)	-0.017	-0.017	-0.013	-0.007
	(-0.886)	(-0.892)	(-0.619)	(-0.148)
ROA (target)	0.070*	0.052	0.032	0.190*
	(2.19)	(1.594)	(0.924)	(2.486)
Cash/assets (target)	0.363***	0.359***	0.722***	0.206**
	(7.101)	(7.014)	(7.844)	(3.105)
Salesgrowth (target)	-4.649**	-4.402*	-4.295*	-6.3
	(-2.715)	(-2.57)	(-2.332)	(-1.456)
Dividend payer dummy	0.042**	0.039**	0.029	0.077*
	(3.146)	(2.924)	(1.936)	(2.452)
Herfindahl	-0.102	-0.107*	-0.114*	-0.118
	(-1.912)	(-2)	(-1.977)	(-0.851)
% owned before	0.355***	0.353***	0.347***	0.423***
	(6.451)	(6.415)	(5.599)	(3.548)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Constant	0.2	0.519	0	0
	(0.477)	(1.216)	(.)	(.)
Panel B. Acquisition by a private acquirer. Dependent variable = success				
Liquidity	-0.021	0	-0.02	-0.022
	(-1.795)	(.)	(-1.433)	(-0.941)
Control variables	Yes	Yes	Yes	Yes
Panel C. Test of differences in coefficients (public - private)				
Liquidity	0.049**	0.029***	0.049**	0.039
Chi-square	(6.58)	(6.72)	(4.9)	(0.79)
N	6,706	6,706	3,602	3,104

Table 7
Offer premium

Panel A (resp., Panel B) reports regression results for acquisitions by public (resp., private) acquirers. The dependent variable is *offer premium*, which is equal to the transaction value *minus* the product of the fraction acquired and the target firm's market value 63 days prior to the announcement, divided by the latter, in percentage points. Panel C reports on tests of differences between coefficients for the regressions reported in Panel A and those reported in Panel B, with chi-square statistics given in parentheses. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Panel A. Acquisitions by a public acquirer. Dependent variable = Offer premium

	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period
Liquidity	12.151***	12.450***	8.694***	27.976***
	(8.832)	(9.059)	(6.558)	(6.434)
Idiosyncratic risk		-1169.415***		
		(-4.103)		
% acquired	-19.635***	-18.787***	-20.550***	-8.282
	(-6.268)	(-6)	(-6.238)	(-1.001)
Size (target)	-2.361***	-1.983***	-2.505***	-0.728
	(-4.304)	(-3.575)	(-4.18)	(-0.586)
Log size (target)	-8.856***	-9.695***	-6.699***	-15.242***
	(-9.83)	(-10.539)	(-7.29)	(-6.424)
Size^2 (target)	36.417**	28.990*	52.612***	-7.979
	(2.818)	(2.227)	(3.657)	(-0.284)
Market/book (target)	0.773***	0.831***	0.209	2.519***
	(3.51)	(3.778)	(0.963)	(4.016)
Leverage (target)	-1.46	-1.886	-1.663	-4.553
	(-0.583)	(-0.754)	(-0.683)	(-0.601)
ROA (target)	15.261***	11.840**	7.827	49.782***
	(3.601)	(2.75)	(1.947)	(3.48)
Cash/assets (target)	-36.678***	-36.908***	-31.192**	-29.172*
	(-4.889)	(-4.932)	(-3.074)	(-2.195)
Governance index	0.676**	0.622**	0.515*	0.709
	(3.169)	(2.919)	(2.441)	(1.168)
Insider ownership	4.185	4.213	4.213	3.531
	(1.908)	(1.926)	(1.958)	(0.551)
Hostile	35.166***	35.405***	9.398	94.499***
	(3.832)	(3.869)	(0.935)	(4.692)
Competing bidders	14.872*	14.472*	10.96	36.081*
	(2.413)	(2.354)	(1.783)	(2.023)
Tender offer	-6.672	-7.302*	-8.679*	-3.726
	(-1.903)	(-2.087)	(-2.151)	(-0.506)
Termination fees	11.665***	11.233***	8.341**	16.529**
	(4.52)	(4.361)	(2.949)	(2.761)
Toehold	2.1	1.849	1.231	7.476
	(1.132)	(1)	(0.713)	(1.043)
All stock	-8.227**	-8.279**	-13.486***	1.553
	(-3.078)	(-3.106)	(-4.634)	(0.257)
Mills Public	15.738**	17.415**	16.833**	51.629**
	(2.576)	(2.844)	(2.646)	(3.095)
Constant	0	97.302*	0	0
	(.)	(2.203)	(.)	(.)
Year fixed effects	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Panel B. Acquisitions by a private acquirer. Dependent variable = Offer premium				
Liquidity	5.522***	5.283***	6.480***	3.634
	(4.693)	(4.514)	(4.954)	(1.369)
Control variables	Yes	Yes	Yes	Yes
Panel C. Test of differences in coefficients (public - private)				
Liquidity	6.629***	7.167***	2.214	24.342***
Chi-square	(11.05)	(15.48)	(1.13)	(20.06)
R-squared	33.44%	33.81%	33.47%	46.21%

Table 8
Target announcement returns

Panel A (resp., Panel B) reports regression results for acquisitions by public (resp., private) acquirers. The dependent variable is the target firm's CAR (in percentage points) over time windows of [−1, +1] (columns 1–4), [−42, +126] (column 5), [−42, 0] (column 6), and [0, +126] (column 7), where [*a*, *b*] denotes the time window (in days) relative to the announcement event for which the abnormal return is measured. Panel C reports on tests of differences between coefficients for the regressions reported in Panel A and those reported in Panel B, with chi-square statistics given in parentheses. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Panel A. Acquisitions by a public acquirer. Dependent variable = Target announcement returns

Return window	[-1,1]				[-42,126]	[-42,0]	[0,126]
	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period	(5)	(6)	(7)
Liquidity	2.227***	2.210***	1.653***	5.207***	6.107*	6.503***	1.529
	(6.576)	(6.515)	(4.735)	(5.375)	(2.018)	(4.23)	(1.626)
Idiosyncratic risk		49.022					
		(0.701)					
% acquired	4.772***	4.731***	4.374***	6.050***	13.536*	5.398	9.665***
	(6.225)	(6.157)	(5.092)	(3.295)	(2.237)	(1.756)	(4.531)
Size (target)	-0.309*	-0.326*	-0.271	-0.226	1.604	0.908	-0.729
	(-2.233)	(-2.323)	(-1.709)	(-0.761)	(1.746)	(1.944)	(-1.895)
Log size (target)	-2.406***	-2.380***	-2.277***	-2.949***	-15.119***	-8.331***	-4.413***
	(-10.54)	(-10.2)	(-9.143)	(-5.332)	(-8.985)	(-9.753)	(-6.941)
Size^2 (target)	5.216	5.57	5.513	3.247	-18.328	-13.76	18.806*
	(1.591)	(1.681)	(1.445)	(0.476)	(-0.897)	(-1.324)	(2.064)
Market/book (target)	0.166**	0.162**	0.125*	0.273	-0.299	0.650**	-0.227
	(3.041)	(2.954)	(2.171)	(1.882)	(-0.636)	(2.726)	(-1.494)
Leverage (target)	0.24	0.26	-0.136	2.311	9.5	7.331*	1.037
	(0.392)	(0.425)	(-0.213)	(1.368)	(1.664)	(2.526)	(0.61)
ROA (target)	3.255**	3.382**	1.731	8.714**	-29.523**	-5.289	-1.396
	(3.137)	(3.199)	(1.642)	(2.723)	(-2.87)	(-1.012)	(-0.485)
Cash/assets (target)	-4.018*	-4.063*	-2.771	-1.878	-24.003*	-3.302	-23.636***
	(-2.11)	(-2.134)	(-1.004)	(-0.6)	(-2.387)	(-0.647)	(-4.464)
Governance index	0.256***	0.257***	0.205***	0.371**	0.549	0.149	0.305*
	(4.785)	(4.803)	(3.616)	(2.646)	(1.313)	(0.702)	(2.054)
Insider ownership	1.218*	1.212*	1.288*	0.78	12.995**	3.707	5.965***
	(2.237)	(2.227)	(2.261)	(0.528)	(2.872)	(1.612)	(3.946)
Hostile	9.002***	8.995***	4.628	20.370***	9.149	0.943	10.147
	(3.816)	(3.813)	(1.681)	(4.18)	(0.69)	(0.14)	(1.517)
Competing bidders	0.542	0.56	-2.581	13.524**	-1.865	2.505	0.553
	(0.331)	(0.342)	(-1.467)	(3.18)	(-0.187)	(0.493)	(0.12)
Tender offer	4.740***	4.764***	4.076***	4.911**	-1.156	4.059	-1.392
	(5.073)	(5.095)	(3.656)	(2.576)	(-0.203)	(1.397)	(-0.537)
Termination fees	1.691*	1.710*	1.439	2.809*	1.465	1.389	0.88
	(2.545)	(2.572)	(1.849)	(1.969)	(0.374)	(0.698)	(0.475)
Toehold	-0.397	-0.394	-0.488	1.352	-10.273	-7.531**	0.492
	(-0.888)	(-0.88)	(-1.098)	(0.809)	(-1.854)	(-2.674)	(0.396)
All Stock	0.397	0.4	0.164	0.69	-3.486	-2.988	-1.524
	(0.582)	(0.588)	(0.21)	(0.468)	(-0.878)	(-1.479)	(-0.803)
Mills Public	-5.996***	-6.193***	-7.107***	1.304	-24.269*	-10.623*	-14.529**
	(-3.71)	(-3.821)	(-3.913)	(0.332)	(-2.283)	(-1.971)	(-3.216)
Constant	36.773***	0	42.253***	8.371	0	141.920**	0
	(4.161)	(.)	(4.609)	(0.527)	(.)	(4.378)	(.)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel B. Acquisitions by a private acquirer. Dependent variable = Target announcement returns							
Liquidity	1.151***	1.025***	1.038**	1.732*	-0.025	0.225	0.847
	(3.924)	(3.563)	(3.267)	(2.451)	(-0.037)	(0.656)	(0.802)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Panel C. Test of differences in coefficients (public - private)							
Liquidity	1.076**	1.185**	0.615	3.475***	6.132*	6.278***	0.682
Chi-square	(5.2)	(6.38)	(1.53)	(7.54)	(3.83)	(15.35)	(0.23)
R-Squared	19.78%	19.79%	15.97%	33.32%	19.17%	23.17%	7.61%

Table 9
Institutional investors and investor horizon

Panel A reports a probit regression where the dependent variable is an indicator variable for targets with liquidity above median and independent variables include *institutional ownership, liquidity, % acquired, the log # transactions, avg. premium, econshock, spread*, year and industry fixed effects. Panel B (C) reports the regression from Table 6 (7) for subsamples of public acquirers with varying percentages of *institutional ownership* while including the level of that term as an additional independent variable. ***, **, and * denote significance at the 0.1%, 1%, and 5% level (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

Panel A. Dependent variable = target liquidity above median				
	(1)	(2) Dispersion control	(3) Low-liquidity period	(4) High-liquidity period
Institutional ownership (acquirer)	0.637**	0.693***	0.537*	0.599
	(3.132)	(3.519)	(2.113)	(1.299)
Liquidity (acquirer)	1.588***	1.602***	1.525***	2.313***
	(5.747)	(5.814)	(5.081)	(5.553)
Control variables	Yes	Yes	Yes	Yes
Panel B. Dependent variable = success. Coefficient of liquidity				
Institutional ownership				
>25%	0.034***	0.034***	0.035***	0.02
	(4.342)	(4.392)	(4.295)	(1)
5%-25%	-0.025***	-0.025***	-0.027***	-0.028*
	(-5.316)	(-5.298)	(-5.308)	(-2.257)
<25%	-0.009	-0.009	-0.004	-0.014
	(-0.735)	(-0.734)	(-0.32)	(-0.534)
Panel C. Dependent variable = offer premium. Coefficient of liquidity by institutional ownership				
Institutional ownership				
>25%	850.479**	887.603**	52.568	2183.443***
	(2.877)	(2.995)	(0.162)	(3.906)
5%-25%	639.854***	634.112***	731.734**	806.294*
	(3.448)	(3.406)	(3.213)	(2.381)
<5%	583.352**	613.370**	784.513**	-254.834
	(2.692)	(2.824)	(2.986)	(-0.693)

Table 10
Private firms and IPOs

Panel A provides statistics for private firms that acquired a public or private target during our sample period and for the subsample of acquirers that conduct an IPO in the five years after the last acquisition they made. Panel B reports the results of a regression in which the dependent variable is an indicator set equal to 1 when the firm goes public in that year (and to 0 otherwise); columns 1–9 report results for the whole sample and columns 10–12 for the subsample. Standard errors are clustered by acquirer in columns 8 and 9. The target *liquidity* average is weighted by transaction value in all columns except for 6 and 7. All acquisition-related variables are as of the previous years indicated by the number of lags. ***, **, and * denote significance at the 0.1%, 1%, and 5% levels (respectively) using heteroskedasticity robust standard errors; *t*-statistics are given in parentheses.

Panel A. Descriptive statistics

Variable	All private acquirers	IPO sample
# Acquisitions	2.29	1.93
# thereof involving a public target firm	0.64	0.41
Acquisition value (annual, in million $)	382.49	348.20
IPO proceeds (in million $)		223.95
N	6,965	970

Panel B. Probit regressions. Dependent variable = acquirer going public

Data	Private acquirers									Acquirers with IPO		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Cluster	N	N	N	N	N	N	N	Y	Y	N	N	N
Weighted	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	Y
Lags	1	2	3	4	5	3	5	3	5	1	2	5
Liquidity (target)	1.643*	1.617*	1.643*	1.599*	1.598*	1.531*	1.474*	1.643**	1.654**	0.534**	0.526**	0.521**
	(2.484)	(2.44)	(2.491)	(2.421)	(2.422)	(2.263)	(2.193)	(3.228)	(3.271)	(2.772)	(2.739)	(2.714)
Log # acquisitions (acquirer)	0.255	0.218	0.226	0.18	0.168	0.242*	0.224	0.226*	0.208*	0.330***	0.067	-0.011
	(1.722)	(1.708)	(1.851)	(1.543)	(1.478)	(1.972)	(1.92)	(1.984)	(1.964)	(3.835)	(0.915)	(-0.164)
Log Acquisition value	0.109**	0.106**	0.105*	0.103*	0.103*	0.106**	0.106*	0.105**	0.105**	0.033	0.046	0.052
	(2.687)	(2.576)	(2.56)	(2.509)	(2.506)	(2.587)	(2.576)	(2.774)	(2.77)	(1.118)	(1.578)	(1.772)
# public acquisitions	-0.4	-0.407	-0.413	-0.41	-0.409	-0.419	-0.416	-0.413*	-0.408*	-0.274***	-0.221**	-0.204**
	(-1.7)	(-1.725)	(-1.749)	(-1.731)	(-1.732)	(-1.77)	(-1.762)	(-2.019)	(-1.989)	(-3.943)	(-3.209)	(-2.961)
Log IPO proceeds										-0.302***	-0.307***	-0.306***
										(-7.368)	(-7.545)	(-7.513)
Liquidity (acquirer industry)	-0.112	-0.054	-0.093	-0.034	-0.037	-0.053	-0.014	-0.093	-0.091	0.790*	0.823*	0.817*
	(-0.135)	(-0.065)	(-0.111)	(-0.041)	(-0.044)	(-0.062)	(-0.016)	(-0.161)	(-0.158)	(2.045)	(2.13)	(2.113)
Log # transactions (period)	0.302	0.295	0.304	0.291	0.291	0.317	0.319	0.304	0.299	0.038	0.081	0.102
	(0.498)	(0.486)	(0.5)	(0.48)	(0.481)	(0.523)	(0.529)	(0.788)	(0.78)	(0.2)	(0.424)	(0.534)
Avg. premium	0.3	0.318	0.318	0.303	0.3	0.312	0.303	0.318	0.31	-0.601*	-0.591*	-0.582*
	(0.48)	(0.514)	(0.513)	(0.488)	(0.483)	(0.498)	(0.482)	(0.832)	(0.804)	(-2.146)	(-2.114)	(-2.08)
Econshock	0.501	0.507	0.497	0.509	0.508	0.516	0.513	0.497*	0.495*	0.087	0.109	0.11
	(1.705)	(1.713)	(1.684)	(1.728)	(1.725)	(1.773)	(1.772)	(2.11)	(2.106)	(0.536)	(0.676)	(0.679)
Constant	-6.625	-6.655	-6.686	-6.604	-6.596	-6.735	-6.71	-6.686**	-6.650**	1.278	1.194	1.167
	(-1.703)	(-1.708)	(-1.712)	(-1.699)	(-1.698)	(-1.735)	(-1.737)	(-2.749)	(-2.755)	(1.177)	(1.103)	(1.076)
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	6,965	6,965	6,965	6,965	6,965	6,965	6,965	6,965	6,965	970	970	970

Table 11
Robustness

Panel A-F report coefficients of target liquidity. Panel A (C) reports results for a Heckman model in which transactions are selected to the second stage if more than 50% are acquired (no toehold was acquired). In the first stage, the independent variables include *liquidity, size, logarithm and square of size, # transactions, avg. premium, econshock, spread,* target *market/book, leverage, ROA, cash/assets, salesgrowth, dividend payer, Herfindahl, owned before, simultaneous earnings announcement,* and year fixed effects. Column 1 reports the results of the first stage, columns 3 and 4 for the second stage, where the dependent variables are *public acquirer* (column 3) and *offer premium* (column 4). The control variables are as listed in Table 4 and 7. Panel B reports results of an IV regression in which the first stage dependent variable is one if at least 50% were acquired and the instruments are *econshock* and the *Herfindahl* index; the second stage is as described for Panel A. Panel D (E) reports results for the subsamples of all-cash (all-stock) transactions, where the dependent variable is *change in liquidity, public acquirer,* and the *offer premium* (for public acquirers only), and the independent variables are as listed in Table 3, 4, and 7. Columns 2 and 4 include *idiosyncratic risk* as an additional independent variable. Panel F reports regressions for the sample of all transactions (i.e., including those that were incomplete); the variables are as in the regression reported in Table 4 and 7. Panel G reports univariate statistics for a sample of contested transactions. ***, **, and * denote significance at the 0.1%, 1%, and 5% levels (respectively) using heteroskedasticity robust standard errors clustered at the industry level; *t*-statistics are given in parentheses.

	First stage		Second stage	
	(1)	(2)	(3)	(4)
	>50% acquired	No toehold	Public acquirer	Offer premium (public acquirers only)
Panel A. Heckman. Selection: >50% acquired				
First stage	-0.087			
	(-1.39)			
Second stage			0.626***	31.020***
			(4.118)	(9.189)
Panel B. IV. Instrumented variable: > 50% acquired				
Second stage			0.268**	13.015*
			(2.672)	(2.556)
Panel C. Heckman. Selection: subsample without toehold				
First stage		0.216***		
		(3.84)		
Second stage			0.310***	11.790***
			(4.182)	(4.057)

	Panel D. Cash		*Panel E. Stock*	
	(1)	(2)	(3)	(4)
Dependent variable		Dispersion control		Dispersion control
Change in liquidity	0.413***	0.413***	0.359***	0.364***
	(5.984)	(5.909)	(3.675)	(3.781)
Acquirer public status	0.177**	0.175**	0.187***	0.187***
	(2.81)	(2.792)	(3.379)	(3.378)
Offer premium	22.094***	22.701**	21.202***	23.299**
(public acquirers only)	(3.788)	(3.013)	(3.646)	(3.081)

Panel F. Robustness checks - Including incomplete transactions				
	(1)	(2)	(2)	(3)
Dependent variable		Dispersion control	Low-liquidity period	High-liquidity period
Acquirer public status	0.154*	0.153*	0.153*	0.093
	(2.527)	(2.494)	(2.494)	(1.761)
Offer premium	12.844***	13.118***	13.118***	9.610***
(public acquirers only)	(8.875)	(9.08)	(9.08)	(6.798)

Panel G: Robustness checks - contested deals

	N	Low-liquidity targets	High-liquidity targets	*t*-statistic
Number of bids	312	1.26	1.37	(1.46)
% public bids	312	46.2%	71.0%	(4.77)
Acquirer public	232	33.6%	65.4%	(5.06)
Success	312	37.2%	57.1%	(3.58)