Are stock-financed takeovers opportunistic?

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Abstract

The estimated probability that a bidder offers all-stock as payment in takeovers increases with measures of market overvaluation of bidder shares. However, when we instrument the bidder pricing error using aggregate mutual fund flows, the reverse happens: greater bidder overvaluation *reduces* the all-stock payment propensity. Since the price pressure created by aggregate fund flows is exogenous to bidder fundamentals—while directly impacting bidder pricing errors—this evidence rejects the notion that all-stock financed takeovers are opportunistic. Bidders paying with stock tend to be small, non-dividend paying growth companies with low leverage, suggesting that financing constraints play an important role in the all-stock payment decision. Moreover, all-stock payment is more likely in high-tech industries, when the two firms operate in highly complementary industries, and when the target is geographically close, indicating that targets in all-stock bids are relatively informed about bidder value. Overall, our evidence does not suggest a particular role for bidder mispricing in driving the all-stock payment decision in takeovers.

1 Introduction

The dot.com bubble burst only two months after the January 2000 AOL TimeWarner merger agreement, causing a reduction of more than $100 billion in the combined market value of AOL TimeWarner. This dramatic price decline has made the AOL TimeWarner merger a poster child for the notion that bidder firms may succeed in converting overvalued shares into hard target assets before the overvaluation is corrected. We present new and powerful empirical tests of this bidder “opportunistic financing” hypothesis by studying the payment method choice in observed takeover bids.

Understanding the likelihood that bidders get away with selling overpriced shares is important not only for parties to merger negotiations, but more generally for the debate over the efficiency of the market for corporate control. The larger concern is that selling overpriced bidder shares may result in the most overvalued rather than the most efficient bidder winning the target—potentially distorting the disciplinary role of the takeover market. The extant takeover literature is split on this issue, with some studies suggesting that investor misvaluation may play an important role in driving stock-financed mergers—especially during periods of high market valuations and merger waves.[1] Others maintain the largely neoclassical view of merger activity in which takeover bids are primarily driven by synergies emanating from firm and industry-specific productivity shocks.[2]

There is theoretical support for both sides of this issue. Synergistic takeovers where the bidder and target managements are asymmetrically informed may also create opportunities for the bidder to sell overpriced shares. In some takeover models involving the choice of payment method, the bidding process itself eliminates information asymmetry between the parties to the deal, and so the trade takes place at fair prices in equilibrium.[3] In other equilibrium models, such as Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004), targets sometimes end up accepting overpriced bidder stock. An assumption common to all these models is that takeover bids are fueled by expected synergy gains.[4] A key challenge in empirical tests of the opportunistic financing hypothesis is therefore to identify effects

[1] E.g. Shleifer and Vishny (2003), Rhodes-Kropf, Robinson, and Viswanathan (2005), Dong, Hirshleifer, Richardson, and Teoh (2006) and Savor and Lu (2009).

[2] E.g. Mitchell and Mulherin (1996), Harford (2005), Maksimovic, Phillips, and Yang (2012), Makaew (2012), Hoberg and Phillips (2010), and Ahern and Harford (2013).

[3] E.g. Hansen (1986), Fishman (1989) and Eckbo, Giammarino, and Heinkel (1990).

[4] Non-synergistic takeover bids representing pure (zero-sum) bets on the relative mispricing of the bidder and target shares are much less likely to be observed. Such bets would likely violate the classical “no trade” theorem, according to which *both* parties to a trade must rationally expect a positive payoff conditional on the trade (Aumann, 1976; Milgrom and Stokey, 1982).

of market mispricing on the payment method choice, given that market prices also reflect anticipation of takeover synergies.

This challenge also means that, notwithstanding the above quote, AOL's initially high market-to-book ratio (M/B), coupled with its all-stock financing decision, is insufficient evidence to infer that AOL acted opportunistically. The inference problem is all the more important as both the extant literature and our results below show a positive and significant correlation between the payment method choice and standard measures of bidder overvaluation. We address the identification problem using a novel instrument for changes in market pricing errors that is exogenous to the latent bidder fundamental characteristics driving the takeover decision. Our contribution is in terms of the instrumentation of the pricing errors and the specification of the payment method choice model. However, we are agnostic in terms of measuring pricing errors *per se*, and use measures commonly found in the extant empirical literature.

Our instrument exploits the finding by Coval and Stafford (2007) and others that large trades by mutual fund investors create significant temporary stock price pressure. Mutual fund flows have been used to form instruments in the extant takeover literature as well, although not in our empirical setting. In particular, Edmans, Goldstein, and Jiang (2012), Khan, Kogan, and Serafeim (2012) and Phillips and Zhdanov (2013) all examine how mutual fund flow-induced price pressure affect the *ex ante* probability of a takeover (at the extensive margin), while we examine the determinants of the all-stock payment choice conditional on a bid being observed (at the intensive margin). Importantly, these studies as well as our own analysis confirm that mutual fund trade-induced price pressure generates significant abnormal stock returns to U.S. listed companies, as required for our instrumentation to work.

The use of mutual fund trade-induced price pressure as an instrument is not necessarily without problems: trades by some active institutional investors and corporate insiders appear to be based on private information about acquiring firm fundamentals.[5] Such information-based trades may drive a positive correlation between the payment method and valuation measures even in the absence of any market mispricing of bidder shares. To reduce the potential impact of information-based fund trades on our instrument, we follow Edmans, Goldstein, and Jiang (2012) and scale the current period's fund flow with *last* period's fund portfolio weights. This scaling removes some potentially information-based, contemporaneous weight changes. Moreover, also as Edmans, Goldstein, and Jiang (2012), we exclude sector-specific funds from our instrument as these are more likely to trade on valuable information about

[5] See, e.g., Nain and Yao (2013), Ben-David, Drake, and Roulstone (2013) and Akbulut (2013).

latent bidder characteristics.

We begin our empirical analysis by developing a cross-sectional "baseline" probit model for the payment method choice. The baseline model captures equilibrium cross-sectional correlations between the use of all-stock (relative to payment methods involving cash) and observable firm and macro characteristics in part suggested by the extant literature. This model shows that all-stock payers tend to be relatively small, non-dividend-paying growth companies with high R&D activity and low leverage. This is hardly surprising as these types of firms tend to have few pledgable assets necessary to raise cash by issuing debt to pay for the takeover. Moreover, the baseline model shows that all-stock takeovers tend to cluster around industry-specific merger waves and in periods with low credit market spreads.

We then add to our baseline probit model measures of bidder valuations that the extant literature suggests may be correlated with market mispricing. Our approach is to start out with several existing valuation error measures before narrowing down to the one with the most apparent statistical power to reject the opportunistic financing hypothesis. The first of these valuation measures is suggested by Rhodes-Kropf, Robinson, and Viswanathan (2005) and is widely used in the takeover literature (discussed below). They essentially decompose a firm's M/B into a long-run valuation component, an industry sector valuation error, and a firm-specific error, all of which are initially included in our model. The second measure is the valuation discount used in Edmans, Goldstein, and Jiang (2012), which is constructed using a different industry valuation benchmark. The third measure is the aggregate sentiment index of Baker and Wurgler (2006). When including these candidate misvaluation measures *uninstrumented* into our baseline probit model, we find that the likelihood of all-stock as payment method is significantly positively related to the Rhodes-Kropf, Robinson, and Viswanathan (2005) pricing errors, weakly related to the Edmans, Goldstein, and Jiang (2012) discount, and statistically unrelated to the Baker and Wurgler (2006) market sentiment index.

Our subsequent instrumental variable (IV) tests therefore primarily focuses on the Rhodes-Kropf, Robinson, and Viswanathan (2005) firm-specific pricing errors This brings us to the paper's main finding. Under the opportunistic financing hypothesis, the likelihood of bidders using all-stock as payment method (as opposed to considerations involving cash) should increase with the instrumented firm-specific bidder valuation error. However, we find the opposite: fund flow shocks that increase the bidder's pricing error significantly *reduce* the probability of observing all-stock as the payment method.

Conditional on the measure of firm-specific pricing error representing true market mispricing, this result strongly rejects the bidder opportunistic financing hypothesis. In light of the novelty of this rejection, we perform a number of robustness checks. These include instrumenting M/B instead of its firm-specific error component, eliminating mixed cash-stock bids (so the choice is between all-stock and all-cash bids only), controlling for relative mispricing of bidders and targets, separating positive from negative pricing errors, and splitting up the instrument into one based on fund inflows and another based on fund outflows. The negative and significant effect of the instrumented pricing error on the likelihood of observing all-stock payment survives all these robustness checks.

Moreover, we investigate potential industry and capital structure channels in order to illuminate the rejection of the opportunistic financing hypothesis and, more fundamentally, the economic nature of the all-stock financing decision. In terms of industry effects, we replace the industry fixed effects in our baseline model with industry and geographic location factors. Interestingly, the likelihood of observing all-stock financed takeovers is greater in high-tech industries, when industry complementarity (a measure of the extent to which the industries of the bidder and target share the same inputs and outputs) is high, and when the bidder and target are geographically close. This additional evidence is important because the industry and location characteristics do not suggest a particular role for misvaluation. On the contrary, targets that are geographically close and operate in highly complementary industries are, if anything, more likely to be well informed about bidder fundamental value and therefore less likely to naively accept overpriced bidder shares.

Accounting for the additional industry variables does not alter the main IV test result: the coefficient estimate for the instrumented valuation error remains negative and statistically significant. We therefore also consider a potential capital structure channel: shocks to bidder market values create deviations from (hypothetical) capital structure targets, with positive (leverage-reducing) shocks reducing the all-stock payment incentive since a stock payment would further reduce leverage. We find some support for this type of financing channel as the the probability of all-stock payment does increase with leverage in excess of a hypothetical target leverage ratio. While fully examining the payment method choice in a capital structure context goes beyond this paper, this evidence raises the possibility that exogenous shocks to the bidder's stock price indirectly affect the all-stock financing choice through their effect on the bidder's overall capital structure optimization.[6]

[6]For additional evidence on the interaction between takeovers and bidder capital structure, see Harford, Klasa, and Walcott (2009), Uysal (2011) and Vermaelen and Xu (2014).

Finally, we examine whether the payment method choice conveys information to the market, both at the time of the merger announcement and over the post-announcement period. If market participants are concerned with bidder adverse selection and overpricing *ex ante*, bidder announcement-period stock returns should be negative on average, and more negative the greater the pricing error (Myers and Majluf, 1984). On the other hand, if all-stock bidders remain temporarily overpriced also following the initial bid announcement, a long-short portfolio strategy—long in all-cash bidders and short in all-stock bidders—should exhibit positive abnormal performance. Our regression results fail to support these additional predictions of bidder overvaluation associated with all-stock offers.

Our overall rejection of the opportunistic financing hypothesis, coupled with our finding that industry characteristics, geographic location and capital structure variables are important drivers of the payment method choice, give credence to the notion that the payment method is driven by fundamental factors unrelated to market mispricing. On the other hand, our results are consistent with the growing evidence that takeover synergies emanate from firm and industry-specific productivity shocks (Eckbo, 2013).

The rest of the paper is organized as follows. Section 2 describes the data selection and sample characteristics, and provides estimates of our baseline model for the all-stock payment choice. Section 3 explains the estimation of bidder pricing errors, and presents the econometric methodology behind and empirical results of the IV tests. Section 4 expands the baseline regression with new industry and location factors driving the payment method choice, while Section 5 examines how the all-stock decision correlates with deviations from capital structure targets. Section 6 describes the results of the event-studies and long-run performance estimation, while Section 7 concludes the paper.

2 A baseline model for the all-stock payment choice

2.1 Industry takeover activity and all-stock bid frequency

Our merger sample is drawn from Thomson's SDC Platinum database. The sample includes merger bids (successful and unsuccessful) from 1980-2008 where (1) both the bidder and the target are U.S. domiciled, (2) the bidder is publicly traded, (3) the SDC transaction type is "merger" (which eliminates asset acquisitions), and (4) SDC provides information on the "consideration structure" (method of payment). When we also exclude financial firms (SIC codes 6000-6999), as well as 15 cases without a primary SIC code in SDC, this selection produces 11,394 merger bids. We label these the "SDC sample".

Our baseline sample used in the empirical analysis further reduces this SDC sample because we also require bidder SDC records to be matched with CRSP and Compustat. However, before imposing this additional restriction, it is instructive to use the larger SDC sample to briefly address a question about aggregate merger activity which has preoccupied the extant literature and which does not require bidder-specific CRSP and Compustat data: to what extent is industry-level merger activity correlated with industry performance? The takeover literature documents a positive correlation between industry stock performance and aggregate takeover activity, which some studies suggest shows a potential for opportunistic bidder behavior (Betton, Eckbo, and Thorburn, 2008).

Table 1 uses the SDC sample to estimate the correlation between industry stock performance and industry-level takeover activity. Industry performance is the three-year cumulative Fama-French 49 (FF49) portfolio returns prior to the bid, from Kenneth French's web site. The industry returns are matched on the acquirer's FF49 industry in columns (1) to (3) and on the target's FF49 industry in columns (4) to (6). In Panel A, the dependent variable is the annual growth in the dollar value of industry merger activity, while the dependent variable in Panel B is the fraction of this dollar value merger activity representing all-stock offers. all variables are defined in Appendix Table 1.

Interestingly, the annual growth in merger volume in Panel A is pro-cyclical even when controlling for industry fixed effects. However, this effect disappears when adding year fixed effects. Moreover, in Panel B, the fraction of all-stock mergers is statistically independent of the three-year FF49 industry returns in all specifications (with or without industry and year fixed effects). Thus, we find no direct evidence that the proportion of all-stock bids increases at the industry level following positive industry performance. While the absence of a significant correlation between industry performance and the all-stock financing propensity does not rule out that some bidders act opportunistically, it helps motivate our focus on within-industry variation and firm-level characteristics throughout the remainder of this paper.

2.2 Baseline sample and characteristics

In the firm-level analysis to follow, we control for industry effects (fixed or otherwise) as well as other financial information. Our requirement that bidder financial information must be found on CRSP and Compustat reduces the sample to 4,919 bids, which is our baseline sample throughout the remainder of the paper. The total bid value of the baseline sample is in excess of $2.3 trillion. Of the 4,919 takeover bids, 31% are all-stock, 29% are all-cash, and 40% are paid with a mix of cash and securities.[7,8]

Figure 1 plots the annual distribution of the number of bids and the percent of all-stock bids in the baseline sample. Panel A plots bid frequency, while Panel B shows total dollar volume of merger bids and the total value of all-stock bids as a fraction of the total merger volume. In Panel A, the yearly number of merger bids increases gradually from 1985 and reaches a peak of 400+ in 1998. The fraction of all-stock bids follows a similar pattern, peaking in 1999 when nearly 50% of the deals were paid in all-stock. After the burst of the internet bubble, the fraction of all-stock bids declines to a low of 4% at the end of our sample period (in year 2008), paralleling the decline in overall merger activity. In Panel B, the value-weighted fraction of all-stock bids varies substantially across the years, and exhibits less correlation with changes in deal volume.[9] Total bid volume peaks at $350+ billion annually in the years 1998 and 1999.

Table 2 reports various sample characteristics across payment methods. Of the sample bids, 83% are successful (classified in SDC as "completed"). The average deal size is 31% (median 13%) of the acquirer's size, and 28% of all targets are public. All-stock bids have slightly higher completion rate and larger relative size than bids involving cash. Moreover, several of the bidder firm characteristics are significantly different across the two subsamples. All-stock acquirers are on average smaller (in total assets), and have higher M/B and R&D expenses (scaled by total assets), and lower asset tangibility and net leverage (defined as the ratio of total debt net of cash and total assets). Furthermore, acquirers making all-stock bids are less likely to pay dividends than acquirers making all-cash or mixed offers.

Table 2 also shows how all-stock deals differ from all-cash/mixed deals in terms of industry relatedness and geographic location. The all-stock payment method is used more often by bidders in the high-tech industry and in industries that are highly complementary with the target industry in terms of sharing inputs and outputs. Moreover, bidders are more likely to select all-stock as payment when the target is located within 30 miles of the bidder (*Local Deal*). Later in the analysis, we use these industry and location factors, which are new to the literature, in our cross-sectional estimation of the payment method

[7] The proportion of all-stock bids is only slightly higher (35%) when measured as the dollar volume of all-stock bids to the total merger volume. About one quarter of the mixed offers consist of stock plus cash only, while the remaining bids include some portion of debt, convertible securities, or other hybrid securities. The average mixed stock-cash deal is split 50% stock and 50% cash. In mixed deals involving additional securities, the average stock and cash portions are each around 40%.

[8] For comparison purposes, Appendix Table 2 reports the annual distribution of the number of bids and the fraction of all-stock, all-cash, and mixed offers in the SDC and baseline samples. As shown, the payment method proportions are similar in the two samples. In the SDC sample, the proportions are 29% all-stock, 28% all-cash, and 42% mixed offers.

[9] The correlation between the annual number of merger bids and the fraction of all-stock bids in Panel A is 52%, while the correlation between the dollar volume of merger bids and the value-weighted fraction of all-stock bids in Panel B is 32%.

choice.[10]

To capture industry-wide conditions, we use the variable *Industry Wave* in Table 2, which is defined as in Maksimovic, Phillips, and Yang (2012). That is, for each FF49 industry and year, we first calculate the aggregate dollar volume of mergers scaled by the total assets of all Compustat firms in the industry. *Industry Wave* is the value of industry mergers-to-total assets in a given year, normalized by its mean and standard deviation over the sample period. Finally, we use *Credit Spread* to capture economy-wide liquidity or business-cycle conditions. The credit spread is the yield-difference between Moody's AAA seasoned corporate bonds and the three-month Treasury bill. As shown in the table, all-stock payment is more common in industry merger waves and in periods of relatively low credit spreads.

2.3 Estimation of the baseline model for the payment method choice

Throughout the analysis, we assume that the bidder's key payment method choice is between all-stock on the one hand and all-cash or mixed cash-securities on the other. As we show below, the main conclusion of this paper is robust with respect to changing the bidder's choice to all-stock versus all-cash (eliminating mixed bids from the analysis). However, focusing on all-stock bids is conceptually attractive: opportunistic bidders attempting to sell undervalued shares likely prefer not to mix cash in the deal in order to maximize the transfer from the target.

The baseline model estimation, reported in Table 3, includes bidder firm characteristics and the two macro variables capturing industry and economy-wide business conditions.[11] All bidder characteristics are from the year prior to the merger announcement year. Several of the coefficient estimates are statistically significant. The likelihood of an all-stock bid is increasing in bidder M/B and *R&D*, and decreasing in the indicator for dividend payers (*Dividend Dummy*), firm size (*Size*, log of total assets) and *Net Leverage*. That is, small non-dividend paying firms with relatively high growth and R&D intensity and low leverage, are more likely to use their stock as acquisition currency.

Columns (4) and (5) of Table 3 add the two macro variables *Industry Wave* and *Credit Spread*, both of which produce highly significant coefficients. Thus, firms are more likely to use all-stock payment

[10] Appendix Table 3 shows the distribution of merger bids and the fraction of all-stock bids across the FF49 industries, sorted in decreasing order of the fraction of all-stock offers. The highest fraction is in the Coal industry where all-stock bids represents 60% of the total number of takeover bids. Various technology industries (e.g., Computer Software, Computers and Electronic Equipment) also have a higher than average number of all-stock deals. Examples of industries with a low fraction all-stock deals are Consumer Goods, Apparel and Textiles, each having 16% all-stock offers.

[11] We do not include target firm characteristics in the baseline model since these are available only for the subsample of public targets (28%).

when the aggregate merger activity in the industry and market-wide liquidity are high. These inferences also hold when including industry fixed effects. Our industry-based evidence complements extant findings that stock-mergers are positively correlated with economy-wide merger activity (Rhodes-Kropf, Robinson, and Viswanathan, 2005). Also, it shows that the earlier finding of Harford (2005) that stock-financing of partial-firm (divisional) acquisitions increases during industry merger waves also extends to merger bids. Column (6) includes a dummy for public target and the bid premium offered for public targets. Neither of these variables are significant, and we exclude them from the subsequent analysis.

The finding that the propensity to pay with stock is higher for small, R&D intensive, non-dividend paying high-growth firms with low leverage suggests that bidder external financing constraints and capital structure considerations may play an important role in the payment method decision. We explore this possibility later in the paper (Section 5), but first turn to effects of bidder valuation errors.

3 Bidder pricing errors and the payment method choice: IV tests

The opportunistic financing hypothesis holds that all-stock bidders exploit market valuation errors by selling overpriced shares. The baseline model in Table 3 shows that bidders are significantly more prone to pay with all-stock when M/B is high. As emphasized in the introduction, this positive correlation does not discriminate between neoclassical factors driving the all-stock decision and opportunistic financing behavior. To achieve discrimination, we first transform the bidder's M/B into a firm-specific valuation error using, in particular, the technique in Rhodes-Kropf, Robinson, and Viswanathan (2005). We then instrument the firm-specific valuation error using shocks to aggregate fund flows, and re-estimate the probability of all-stock payment with the instrumented valuation error. Since aggregate fund flows are exogenous to the bidder's payment method decision, this IV test allows a relatively powerful examination of our opportunistic financing hypothesis.

3.1 Estimating bidder valuation errors

Our approach to estimating bidder pricing errors is agnostic: we import measures used in the takeover literature, where mispricing is universally defined as the difference between the observed market value and some value estimate presumed to capture the firm's true or intrinsic value. While there are a variety of valuation models, a particularly popular measure is the one developed by Rhodes-Kropf, Robinson, and Viswanathan (2005), which we explain below. For example, this measure is used by Fu, Lin, and Officer (2013), while Hoberg and Phillips (2010) use a closely related measure that is also inspired by the valuation approach in Pastor and Veronesi (2003).[12]

3.1.1 Rhodes-Kropf, Robinson, and Viswanathan (2005) firm-specific errors

We follow Rhodes-Kropf, Robinson, and Viswanathan (2005) and decompose bidder i's market value at time t, M_{it} into a fundamental ("true") value at time t, denoted V_{it}, and a long-run (time invariant) fundamental value, V_i. This is done by first estimating, in year t, the following cross-sectional regression for the population of N Compustat firms in bidder i's respective Fama-French 16 (FF16) industry:

$$M_{jt} = \alpha_t + \beta_t X_{jt} + e_{jt}, \quad j = 1, ..., N. \tag{1}$$

Here, M_{jt} is the equity market value of bidder i's industry peer j, and the vector X_{jt} consists of the book value of equity, operating cash flow, and net leverage of firm j, all at time t.[13] Bidder i's fundamental value is the fitted value $V_{it} \equiv \hat{\alpha}_t + \hat{\beta}_t X_{it}$. Moreover, the fundamental long-run value is $V_i \equiv \overline{\alpha_i} + \overline{\beta_i} X_{it}$, where $\overline{\alpha}$ and $\overline{\beta}$ are the time series averages of the annual estimated values of $\hat{\alpha}_t$ and $\hat{\beta}_t$, respectively, over the sample period (1980-2008).

The decomposition of M/B is as follows (where lower case denotes natural logarithm):

$$m_{it} - b_{it} = [m_{it} - v_{it}] + [v_{it} - v_i] + [v_i - b_{it}]. \tag{2}$$

The first square bracket on the right-hand-side of Eq. (2) is the *Firm-Specific Error*: the difference between time t market value and fundamental value conditional on the industry pricing rule. This term reflects firm-specific deviations from fundamental value, because V_{it} captures valuations common to a sector at a point in time. The second square bracket is the *Time Series Sector Error*: the difference between the time t fundamental value and the fundamental value based on the long-run industry pricing rule. The third component is the *Long-Run Value to Book*: the difference between the fundamental value based on the long-run industry pricing rule and acquirer i's book value of equity in year t.

[12] Dong, Hirshleifer, Richardson, and Teoh (2006) provide an alternative measure of misvaluation based on the residual income model developed in the accounting literature.

[13] In Rhodes-Kropf, Robinson, and Viswanathan (2005), the vector X consists of book value of total assets, net income, and leverage. Our variables differ slightly in order to maintain consistency with the variables used elsewhere in our analysis.

3.1.2 Two alternative proxies for bidder mispricing

For robustness, we also examine the price discount developed by Edmans, Goldstein, and Jiang (2012). In their context, the discount represents either the difference between the observed market value and the higher "full" value of the firm if managerial inefficiencies and agency costs were absent, or market mispricing. Following their lead, we estimate the full value using a subset of the most "successful" (highest-valued) industry peers, defined as firms in the top $(1-\alpha)$th percentile of market value in the FF16 industry of firm i in year t. By definition, the fraction α of firms with valuations below the successful peers trade at a discount, and we follow Edmans, Goldstein, and Jiang (2012) and set α=0.8. The fundamental value V_{it} is now the fitted value from the quantile regression of equation (1). By construction, quantile regressions yield the fraction $(1-\alpha)$ of positive residuals and the fraction α of negative residuals. Successful firms are defined by a positive residual, $e_{it} > 0$. The rest of the firms trade at a discount. The *Edman's et. al's Discount* is then computed as $(V_{it} - M_{it})/V_{it}$.

We also apply the Baker and Wurgler (2006) annual sentiment index, obtained from Jeffrey Wurgler's web site.[14] This index is based on the first principal component of the following sentiment proxies: value-weighted dividend premium, total IPO volume, average first-day IPO returns, average closed-end fund discount, fraction of equity in new securities issuances, and average monthly NYSE turnover in year t.

3.2 Estimation without valuation error instrumentation

Table 4 shows the coefficient estimates in probit regressions for all-stock offers with the acquirer misvaluation measures added to our baseline model (replacing M/B). The data requirements reduce the sample size somewhat, to a total of 3,900 bids (which drops further to 3,540 observations when the sentiment score is added). In column (1), which excludes the baseline model factors, the decision to pay with stock is significantly and positively correlated with all three components of M/B estimated using Rhodes-Kropf, Robinson, and Viswanathan (2005).[15] As shown in columns (2) and (3), which also exclude our baseline model factors, the Edmans, Goldstein, and Jiang (2012) discount produces marginally significant slope coefficients, while the Baker and Wurgler (2006) sentiment index is highly significant.

Columns (4) and (5) show that the significance of the valuation measures survives inclusion of the

[14] We use the original index, where the data is orthogonalized to a set of macroeconomic conditions, downloaded from http://people.stern.nyu.edu/jwurgler.

[15] Rhodes-Kropf, Robinson, and Viswanathan (2005) find that the probability of merger activity increases with the firm-specific and time-series sector pricing errors, while it decreases with the long-run pricing error.

bidder and macro characteristics from the baseline model. However, when we also include industry fixed effects in column (6), several of the valuation measures lose much of their statistical significance. This is true for *Sentiment* and *Long-Run Value to Book*, both of which become insignificant at conventional levels, while *Edmans et al's Discount* remains significant at the five percent level. On the other hand, both *Firm-Specific Error* and *Time-Series Sector Error* remain highly significant. Given these results, the subsequent IV analysis focuses primarily on instrumenting *Firm-Specific Error*.

3.3 Estimation with valuation error instrumentation

3.3.1 The instrument

We use mutual fund price pressure as the instrumental variable. The price pressure of stock i in quarter t is defined as:

$$Z_{it} \equiv \frac{\sum_j (F_{jt} s_{ij,t-1})}{TVOL_{it}}, \tag{3}$$

where F_{jt} is the net flow experienced by fund j in quarter t

$$F_{jt} \equiv TNA_{jt} - TNA_{j,t-1}(1 + R_{jt}), \tag{4}$$

and where TNA_{jt} is Total Net Assets and R_{jt} is the stock return for fund j (from CRSP). As Edmans, Goldstein, and Jiang (2012), we focus on larger fund flows and set $F_{jt} = 0$ when $-5\% < F_{jt} < 5\%$. Note also that, while they use fund outflows only, we use both fund inflows and outflows. This is because bidder misvaluation relevant for the payment method choice may in principle be driven by both upward and downward price pressure.

Moreover, the definition of $s_{ij,t-1}$, the share of stock i of fund j's total net assets at the end of the previous quarter, is given by:

$$s_{ij,t-1} \equiv \frac{Share_{ij,t-1} Price_{i,t-1}}{TNA_{j,t-1}}, \tag{5}$$

where $Share_{i,j,t-1}$ is the number of stock i shares held by fund j (from Thomson Reuters mutual fund holdings data base), and $Price_{i,t-1}$ is the price of stock i. Finally, $TVOL_{it}$ is the total dollar trading volume of stock i in quarter t (from CRSP).

The summation in (3) is over all non-sector specific funds, defined from the CRSP investment objectives. Sector funds are excluded because flows to mutual funds specializing in a specific industry might be correlated with industry shocks that also drive takeover activities and payment methods. Moreover, we aggregate Z_{it} over the four quarters in the fiscal year prior to the takeover announcement to get the price pressure.

Since the price pressure Z_{it} is constructed using fund portfolio weights lagged one period ($s_{ij,t-1}$), it presumes that the fund flow F_{jt} is passively scaled up or down, preserving lagged weights. In other words, Z_{it} measures mutual funds' hypothetical trades mechanically induced by net investment flows by their own investors. While the assumption of constant weights from t-1 to t holds for passive funds, other funds likely change their weights in period t (Khan, Kogan, and Serafeim, 2012). By lagging the funds' weights in bidder i by one period, the instrument tends to neutralize the potentially confounding effect of informed fund trades. This enhances the quality of our instrument for our purposes as it is unlikely to reflect latent bidder characteristics also driving the payment method choice.

As documented clearly by Figure 2 in Edmans, Goldstein, and Jiang (2012), the price pressure instrument Z has a substantial impact on stock prices in general and, as shown by our own instrument validity tests below, succeeds in explaining a statistically significant portion of the cross-sectional variation in the bidder firm-specific pricing pricing error *(m-v)* in equation (2). The opportunistic financing hypothesis therefore predicts that Z should affect the payment method choice indirectly through its effect on the bidder's stock price. Specifically, an exogenous pricing shock (represented by Z) that increases m-v is predicted to also increase the likelihood that the bidder chooses the all-stock payment method. We turn to tests of this hypothesis next.

3.3.2 The two-stage IV model and tests

Our baseline choice model estimated in Table 4 has the following form:

$$\begin{aligned} AllStock* &= \mu_0(m-v) + \mu_1 X + \xi \qquad (6) \\ AllStock &= 1 \text{ if } AllStock* > 0 \text{ and } 0 \text{ otherwise} \end{aligned}$$

where *AllStock∗* is the latent variable for the probability of an all-stock deal and *AllStock* is the dummy variable for *AllStock∗*. As before, m-v is the firm-specific pricing error and X is the vector of bidder characteristics. Since unobservable bidder characteristics may affect both m-v and the payment method choice, we instrument *m-v* using Z in (3). Thus, rewrite the baseline choice model (6) as follows:

$$m - v = \gamma_1 X + \gamma_2 Z + \eta \quad (7)$$

$$AllStock* = \mu_0(m - v) + \mu_1 X + \lambda\hat{\eta} + \xi', \quad (8)$$

where $\hat{\eta}$ is the vector of fitted residuals from the first stage OLS regression (7). Here, $\hat{\eta}$ is an auxiliary regressor which absorbs the correlation between the error term and the *m-v* regressor ($Cov(\eta, \xi)$), producing a well-behaved residual ξ' (Rivers and Vuong, 1988; Edmans, Goldstein, and Jiang, 2012).[16]

Table 5 presents the results from estimating regression equation (7)—the first-stage relation between mutual fund price pressure and the misvaluation measure. In columns (1) to (4), M/B is used as the misvaluation measure, while columns (5) to (8) use *Firm-Specific Error (m-v)*. The coefficients on *Mutual Fund Flow* (Z) are positive and statistically significant at the 1% level for both M/B and *Firm-Specific Error*. In other words, firms with buying (selling) pressure tend to have higher (lower) valuation errors as defined here.

In columns (2) to (4) and (6) to (8), we include additional controls for bidder characteristics, industry waves, credit spreads, and industry fixed effects from the baseline regressions in Table 3. Following Edmans, Goldstein, and Jiang (2012), we also replace total assets as a proxy for size with *Sales Rank* and *Market Share*. *Sales Rank* is the rank of sales among all Compustat firms in the firm's FF49 industry, while *Market share* is the ratio of the firm's total assets and the sum of total assets of all of Compustat firms in its FF49 industry. Sales rank and market share may be more appropriate proxies for relative size in, for example, labor-intensive industries (such as services) and in high-growth industries. The estimated coefficients on fund flows are robust to the inclusion of these additional controls. Mutual fund flows have a strong impact on M/B and the firm-specific valuation error, and the impact is seemingly unaffected by the bidder and macro characteristics.

The coefficient estimates from the instrumental variable regressions (the second stage of the IV test procedure) are reported in the last four columns of Table 6 using M/B and Table 7 using the *Firm-Specific*

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[16] To illustrate, let $\widehat{m - v}$ denote the fitted regression value in (7). Equation (8) can then be rewritten as

$$AllStock* = \mu_0(\widehat{m - v} + \hat{\eta}) + \mu_1 X + \lambda\hat{\eta} + \xi' = \mu_0(\widehat{m - v}) + \mu_1 X + (\mu_0 + \lambda)\hat{\eta} + \xi'.$$

With linear functions in both steps, it would have sufficed to replace $m - v$ with its fitted value in the second stage estimation. Since the probit regression is nonlinear, however, the proper procedure is to add the first-stage fitted residual $\hat{\eta}$ in equation (8) (Rivers and Vuong, 1988), making μ_0 unbiased for the effect on the payment method of exogenous changes to the pricing error.

Error. For comparison purposes, we also report the uninstrumented probit regression results in the first four columns. The system of two equations (Eq. (7) determining misvaluation and Eq. (8) determining the payment method choice) is estimated simultaneously using maximum likelihood. In columns (1) and (5) of the two tables, the misvaluation measure is the only explanatory variable. In the remaining columns, we include bidder firm characteristics and macro variables from the first-stage regressions in Table 5.

Columns (1) to (4) of Table 6 and Table 7 show that the coefficients on the *uninstrumented* valuation measures M/B and *Firm-Specific Error* are both positive and statistically significant. However, this changes dramatically in columns (5) to (8) of the two tables. In these instrumented regressions, the coefficients on the valuation measures are *negative* and significant at the 1% level in both tables.[17] In other words, with price pressure induced by mutual fund flows as an instrument, we find a statistically significant inverse relationship between exogenous bidder price shocks and stock payment. This suggests that the uninstrumented probit estimation in columns (1) to (4) suffers from endogeneity bias, and that the true direction of causality runs from a positive pricing error shock to a lower likelihood that the payment method is all-stock, contradicting the opportunistic financing hypothesis.[18]

Below, we discuss potential explanations for the surprising negative effect of the instrumented pricing errors on the all-stock probability. These alternatives center around industry effects, geographic proximity of targets to bidders—which reduce information asymmetries and therefore the likelihood that bidder stocks are overpriced—as well as possible capital structure arguments. However, we first turn to some interesting robustness checks on this negative correlation estimate.

3.4 Additional robustness tests

Table 8 shows results of the second stage of the IV test for specific subsamples of the data that may increase the power to identify true bidder opportunism. Columns (1) to (4) restrict the sample to all-stock versus all-cash bids, while columns (5) to (8) limit the sample to deals where the bidder's M/B exceeds the target's M/B. Comparing all-stock to all-cash bids increases power because mixed cash-stock offers may to some extent also reflect an incentive to sell overpriced shares while all-cash bids do

[17]The signs for the control variables do not change, except for sales rank and market share.

[18]Two tests for validity of Z as an instrument are reported at the bottom of each of the two tables. The Wald test statistics—which test the exogeneity of the equation system—are significant at the 1% level in all specifications, which supports our decision to control for endogeneity. The weak instrument test also shows F-statistics that are highly significant in all specifications, confirming that the instrument Z is valid for both bidder M/B and *Firm-Specific Error*.

not.[19] Restricting bidder M/B to exceed target M/B increases power by increasing the likelihood in the data that the bidder is overpriced relative to the target.[20] Notwithstanding the sample reduction that these additional restrictions imply, the results are again statistically significant. Moreover, in the instrumented regressions, the probability of using all-stock as payment method is again inversely related to the instrumented firm-specific pricing error.

Turning to Table 9, in columns (1) and (2) the endogenous variable is *Firm-Specific Error* which we instrument using positive mutual fund flows only (the majority of the net fund flows in our sample). The instrument here is $Z = Z_{it}$ when $Z_{it} > 0$ and zero otherwise, thus focusing on the portion of our instrument with power to increase the bidder firm-specific pricing error. The last four columns of Table 9 further condition the all-stock payment probability on a positive and a negative pricing error, first uninstrumented in columns (3) and (4) and then instrumented in columns (5) and (6). In these columns, the three endogenous variables and their corresponding instruments are as follows:

(1) The positive component of the pricing error, *Firm-specific Error*Positive Error*, is instrumented using positive mutual fund flows: $Z = Z_{it}$ when $Z_{it} > 0$ and zero otherwise.

(2) The negative component of the pricing error, *Firm-specific Error*(1-Positive Error)*, is instrumented using negative mutual fund flows: $Z = Z_{it}$ when $Z_{it} < 0$ and zero otherwise.

(3) The positive pricing error dummy, *Positive Error*, is instrumented using a positive mutual fund flow dummy: $Z = 1$ when $Z_{it} > 0$ and zero otherwise.

The results in Table 9 are interesting. When instrumenting using positive mutual fund flows in columns (1) and (2), the instrumented firm-specific pricing error again receives a negative and significant coefficient. In columns (3) and (4), the first of the three *uninstrumented* positive pricing error receives a coefficient estimate that is significantly positive while the second and third pricing errors are statistically insignificant. However, in columns (5) and (6), all three *instrumented* pricing errors are statistically insignificant. Thus, these results further reject the opportunistic financing hypothesis.[21]

[19] Eckbo, Giammarino, and Heinkel (1990) present a fully revealing separating equilibrium in a takeover model where bidders may select mixed cash-stock offers. In this equilibrium, the greater the fraction of the total offer that is paid in cash, the greater the undervaluation of bidder stock *ex ante*.

[20] This restriction also corresponds to the equilibria depicted in the models of Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2005), where targets sometimes end up accepting overpriced bidder shares.

[21] Table 8 and Table 9 show that the instruments pass endogeneity and weak instrument tests. Moreover, while we calculate robust standard errors to infer statistical significance, inferences based on clustered standard errors are identical. This holds also for Table 6 and Table 7.

4 Effects of industry competition and target geographic proximity

4.1 Industry relatedness and competition

Up to this point, we have used industry fixed effects to capture unique characteristics of the bidder's industry. In this section, we replace the industry fixed effect "black box" with industry characteristics, including measures of bidder and target industry complementarity and competition. About half of our sample deals involve bidder-target pairs that operate in different FF49 industries. Controlling for industry relatedness is potentially important as targets in related deals likely face lower uncertainty in terms of estimating the true value of bidder shares used in the transaction, which for some bidders facilitates the use of stock. Moreover, the degree of industry competition may also affect the payment method: acquirers in relatively competitive industries tend to have less financial slack, which may raise the likelihood of using stock to pay for the target. To account for these possibilities, we repeat the IV-test using an expanded baseline choice model.

We create two measures for industry relatedness by mapping all 4-digit SIC codes into the Input-Output industry matrix of the U.S. Bureau of Economic Analysis (BEA) and using the relatedness measures of Fan and Lang (2000). $Vertical\ Relatedness$ captures the fraction of input/output of the acquirer industry bought from/sold to the target industry. *Complementarity* captures the extent to which the acquirer industry and the target industry share the same input and output. We further compute two measures for the product market competition in the acquirer's FF49 industry in a given year. The first is the adjusted Herfindahl Hirschman Index (HHI), based on total assets.[22] The second measure is an indicator for *Industry Leader*, taking the value of one if the acquirer's total assets is in the top quintile of its FF49 industry.

The first three columns of Table 10 report the coefficient estimates from simple probit regressions for the all-stock choice, adding industry characteristics as explanatory variables in addition to *Firm-Specific Error* and control variables from Table 5. The last three columns report the same choice model, but with the firm-specific valuation error instrumented with price pressure from mutual fund flow. The regressions include a dummy variable indicating that the acquirer's primary four-digit SIC code is in the high-tech

[22] $HHI = \sum_j^n X_j^2 / \sum_j^n X_j$, where X_j is the total assets of firm j, $j = 1, 2.., N$, and N is the number of firms in the industry. We use total assets because the panel data on sales is relatively noisy. The HHI index ranges from 0 to 1. The U.S. Department of Justice defines an industry as concentrated if its HHI exceeds 0.18 and competitive if its HHI is below 0.10.

industry (according to American Electric Association). The original values of the variables *Sales Rank*, *Market Share*, *Dividend*, *R&D*, and *Leverage* are replaced with components that are orthogonal to the industry regressors. That is, for each variable, we first regress that variable on the industry regressors and then use the regression residual in Table 10. We do this because the original variables are highly correlated with industry variables—in particular with *Industry Leaders* and *High-Tech Dummy.*

The IV tests yield the same results as before, with a positive coefficient sign for the uninstrumented *Firm-Specific Error*, which switches to a negative sign when the variable is instrumented with mutual fund flow. Again, the coefficients for misvaluation are highly significant in all specifications, as are the test statistics in the exogeneity and weak instrument tests. In other words, replacing industry fixed effects with more economically intuitive industry characteristics does not change the inferences with respect to our opportunistic bidder financing hypothesis.

Turning to the industry characteristics themselves, the probability of an all-stock deal is higher when the acquirer and target industry share the same input/output (complementarity), and when the acquirer is in the high-tech industry.[23] The indicator for industry leader, which is marginally significant in columns (1) to (3), is positive and highly significant in the IV tests in columns (4) to (6). That is, firms that are major players in their respective industries are more likely to use stock as payment method. Adding the baseline bidder and macro control variables do not change any of the results.

Overall, bidders are more likely to make all-stock bids in the high-tech industry and when the target and bidder industries share the same input and output. This is consistent with fewer information asymmetries and higher synergy gains driving the all-stock deal consideration. The potential for information asymmetry between the deal partners may also be affected by their geographic distance to each other, which we examine next.

4.2 Geographic proximity and location

Geographic proximity and location may matter for the payment method choice for at least two reasons. First, target managers likely have more valuation-related information about the acquirer when the two firms are geographically near one another. Second, acquirers located in towns with relatively small populations may have a dominant employer position, which makes these companies locally well-known.

[23]While not shown here, a third and simpler measure of relatedness, i.e. a dummy variable indicating that the bidder and target operate in the same three-digit SIC code industry, also produces similar statistical inferences.

Thus, geographic proximity and location may reduce information asymmetries, increasing the use of all-stock payment in local deals.

We examine two measures of location: the distance between the acquirer and the target, and the distance between the acquirer and a large metropolitan area. For each firm, we use zip codes from SDC to calculate latitude (lat) and longitude (long) coordinates based on the 1987 U.S. Census Gazetteer Files. Following Cai and Tian (2012), we compute the distance between acquirers and targets using the spherical law of cosines formula:

$$Distance = arccos[sin(lat1).sin(lat2) + cos(lat1).cos(lat2).cos(long2 - long1)]R, \tag{9}$$

where R is the radius of earth (3,963 miles), (lat1,long1) are the acquirer coordinates, and (lat2,long2) are the target coordinates.

Our merging firms are on average approximately 1,000 miles (median 600 miles) apart. However, the distance variable is bimodal. A large number of bidder-target pairs are located in the same zip code area, while many acquirers and targets are located on opposite sides of the country (a distance of about 2,500 miles). We define the variable *Local Deal* as a takeover where the acquirer and the target are located within 30 miles from each other.[24] Following Cai and Tian (2012), we also construct an *Urban Deal* dummy, indicating that the acquirer firm is located within 30 miles from one of the ten largest metropolitan areas in the U.S.[25] In our sample, 40% of the acquirers are located in, or close to, a large city.

Table 11 shows the coefficient estimates in probit regressions with the two geographic location variables as well as the industry variables from Table 10. We deal in two ways with the fact that the acquirer or target zip code is missing in SDC or that the SDC zip code cannot be found in the Census Gazetteer for 45% of the sample (2,215 deals). The first is to set *Local Deal* and *Urban Deal* to zero for cases with missing zip codes (shown in columns (1) to (3), (7) and (8)). The second is to eliminate the deals with missing zip codes, reducing the sample size to 2,704 merger bids (shown in columns (4) to (6)). As in Table 10, *Sales Rank*, *Market Share*, *Dividend*, *R&D* and *Leverage* are orthogonalized to the industry variables.

[24] Kedia, Panchapagesan, and Usyal (2008) use a 100 kilometers (60 miles) cut-off in their study of acquirer returns. Our results are not sensitive to using their cutoff distance.

[25] These are Boston, Chicago, Dallas, Detroit, Houston, Los Angeles, New York City, Philadelphia, San Francisco, and Washington DC. Coordinates of the city centers are obtained from www.world-gazetteer.com.

Interestingly, in all specifications, the probability of all-stock consideration is significantly greater for local deals, while the urban deal dummy is insignificant. Table 11 also shows that the variables *Industry Complementarity* and *High-Tech Dummy* are highly significant in all specifications. In other words, geographic proximity and industry relatedness are both important predictors of all-stock takeover bids. Bidders are more likely to pay with all-stock when the target is operating in a complementary industry and is geographically close. A consistent interpretation of this result is that bidders are more willing to pay with shares when the target is relatively informed about the true bidder value, as this reduces concerns with costly adverse selection in all-stock financed bids.

5 The impact of capital structure on the all-stock payment decision

The above analysis shows that the instrumented M/B and firm-specific valuation error negatively impacts the probability of using all-stock as payment. In this section we explore a potential capital structure channel for this result: exogenous price shocks create deviations from the bidder's target leverage ratio which in turn may affect the payment method choice. Recall from the baseline model estimation in Table 3 that the likelihood of an all-stock offer is decreasing in net leverage. One interpretation of this result is that optimal leverage ratios of all-stock bidders tend to be low in the cross-section. In this section we examine further whether the all-stock payment choice also depends on bidder deviations from hypothetical leverage and cash balance targets.

Since positive exogenous price shocks lower the bidder's market leverage, we expect bidders with leverage targets to pay in cash rather than in stock (it helps restore leverage to its target). We also add indicators for current-period and lagged seasoned equity offerings (SEOs) by the bidder. The first reason for this, and related to the above capital structure argument, is that the SEO indicator may capture bidder fundamentals dictating a preference for financing with stock not explained by the baseline controls. The second reason is informational: the substantial disclosure requirements governing SEOs reduce information asymmetry between the firm and the market (Eckbo, Masulis, and Norli, 2007). This reduction lowers adverse selection risk and so may increase bidder incentives to offer its stock to the target. Under either of these two arguments, we expect the all-stock probability to increase with the SEO indicators.

We follow Harford, Klasa, and Walcott (2009) and estimate, for each year, the deviation from the acquirer's target leverage as the fitted error term $\hat{e}$ from the OLS regression

$$Leverage_t = f(X_{t-1}) + e, \tag{10}$$

where X_{t-1} is a vector of lagged firm characteristics:

$$\begin{aligned} X_{t-1} &= \{Size_{t-1},\ Operating\ Efficiency_{t-1},\ M/B_{t-1},\ R\&D_{t-1},\ missing\ R\&D_{t-1}, \\ &\quad Asset\ tangibility_{t-1},\ FF49\ industry\}, \end{aligned} \tag{11}$$

and where $missing\ R\&D_{t-1}$ is a dummy indicating a missing value for R&D in Compustat. Similarly, we estimate the bidder's excess cash holdings as the fitted residual $\hat{g}$ from the OLS regression

$$Cash\ Holding_t = f(X_{t-1},\ Leverage_{t-1}) + g, \tag{12}$$

where *Cash Holding* is cash/total assets and X_{t-1} is the same vector of lagged firm characteristics.[26]

Since we use fund flows to instrument market valuation errors, we cannot also use this instrument for target leverage deviations. Thus, we proceed by simply expanding the baseline model with the above estimates of the deviations from cash and leverage targets. The results are shown in Table 12. The first four columns use market leverage, while the last four columns use book leverage. Whether using market or book leverage, the likelihood of an all-stock bid is decreasing in the acquirer firm's leverage and increasing in the deviation from the target leverage. This evidence suggests that bidders are more likely to choose all-stock when it helps adjust the capital structure towards a target.

Moreover, for some specifications in Table 12, bidders are more likely to use all-stock consideration both when cash balances are high and when they are below estimated targets. This finding is similar to Pinkowitz, Sturgess, and Williamson (2013), who report that the probability of using stock increases with the acquirer's level of cash holdings. Moreover, Gao (2011) finds that excess cash balances reduce the probability of paying with all-stock in the period 2002-2004. However, as Table 12 also shows, the

[26] Appendix Table 4 shows the time-series averages of the coefficient estimates of the annual leverage and cash regressions. In column (1), bidder *Market Leverage* (scaled by the sum of debt and market value of equity) increases with size, operating efficiency, asset tangibility and the dummy for missing R&D, and decreases with M/B and R&D expenses. In column (2), *Book Leverage* (scaled by total assets) is decreasing in M/B and increasing in asset tangibility and the dummy for missing R&D. In the regression for *Cash* (column (3)), all variables enter with the opposite sign as for *Market Leverage*. Moreover, cash holdings are decreasing in firm leverage.

significance of cash holdings and excess cash balances are insignificant when industry fixed effects are included (columns (4) and (8)). Thus, rather than capturing firm-specific effects, these variables likely reflect industry-specific cash-balance effects as some industries (e.g. R&D intensive) rely more on cash financing than others.

Turning to the SEO indicator variables, our SEO data is from SDC's new issues data base. Last year's stock issue dummy is significant: the conditional probability of an all-stock payment increases in the prior SEO activity of the bidder. Giuli (2013) also finds that all-stock bidders tend to have made SEOs around the acquisition date, and interpret this as evidence of selling overpriced equity. However, given our rejection of the opportunistic financing hypothesis, our interpretation of the effect of SEOs does not involve bidder overpricing.

The regressions further include a binary variable indicating that the relative size of the target is in the top quartile. The cutoff point for the top quartile is deal values greater than 30% of the acquirer's total assets. The *Large Deal Dummy* receives a positive and highly significant coefficient in all specifications. That is, controlling for acquirer size, bidders are more likely to offer all-stock in relatively large deals. In columns (2) to (4) and (6) to (8), the regressions control for firm and macro characteristics from the baseline model, which produce similar coefficients as before.

In sum, bidders with relatively low leverage and high cash balances tend to use all-stock. Furthermore, bidders are more likely to offer stock when this reduces the deviation from the target leverage and cash holdings, and after undertaking a SEO. These correlations are consistent with capital structure targets and financing constraints being important determinants of the payment method choice. Accounting for our rejection of the opportunistic financing hypothesis, these capital structure considerations (SEOs and adjustments towards leverage targets) are unlikely to involve opportunistic trading of overpriced bidder stock.

6 Does the payment method convey information?

If market participants are concerned with bidder adverse selection and overpricing *ex ante*, bidder announcement-period stock returns should be negative on average, and more negative the greater the *ex ante* pricing error uncertainty. Also, if all-stock bidders remain temporarily overpriced even after the initial bid announcement, a long-short portfolio strategy—long in all-cash bidders and short in all-stock bidders—should exhibit positive abnormal performance. We test these empirical propositions below.

Abnormal returns are estimated using the standard market model:

$$r_{it} = a + br_{mt} + e_{it}, \tag{13}$$

where r_{it} is bidder i's daily (CRSP) stock return in excess of the risk free (Treasury-bill) rate, and r_{mt} is the daily excess return on the value-weighted market portfolio. The market model parameters are estimated over day -291 through day -42 relative to the day of the first bid announcement (day 0) as reported by SDC, and we use the three-day window [-1, 1] to estimate announcement-period abnormal returns. Our estimation procedure produces 4,442 merger announcement returns, with an average acquirer abnormal return of 0.9%.

The coefficient estimates from OLS regressions of the acquirer's announcement return are shown in Table 13. The method of payment is captured by an indicator for all-stock offers. The regressions introduce several interaction variables between all-stock bids and various valuation measures (M/B, *Firm-Specific Error* and *Edmans et al's Discount*), and they control for bidder characteristics and industry fixed effects. The all-stock dummy produces insignificant coefficients in all specifications, as well as when included on its own together with only industry fixed effects (column (5)).[27]

Table 13 further shows that the interaction variables between all-stock and the various valuation measures are all insignificant, as is the dummy for public target.[28] As widely reported in the takeover literature, bidder announcement returns are negatively correlated with acquirer size (Betton, Eckbo, and Thorburn, 2008). Moreover, bidder announcement returns are increasing in the bidder's net leverage. A consistent interpretation is that investors view acquisitions more favorably when undertaken by bidders with low levels of free cash flow (Jensen, 1986). These results fail, however, to support the proposition that the all-stock payment method choice signals to the market that the bidder stock is overpriced.

What if bidder shares in all-stock deals tend to be overpriced, but that the market fails to make the necessary pricing correction upon the bid announcement? In this case, we should observe reversal of the stock price over some period following the all-stock bid announcement. To examine this possibility,

[27] The insignificance of the all-stock dummy, which is consistent with the large-sample evidence in Moeller, Schlingemann, and Stulz (2004) and Betton, Eckbo, Thompson, and Thorburn (2013), is also confirmed when comparing the announcement returns between all-stock and all-cash/mixed offers with propensity score matching of the bidders. We match the treatment (all-stock) and control (all-cash/mixed) groups on *Size, Operating Efficiency, M/B, Dividend Dummy, R&D, Leverage*, and *Asset Tangibility*.

[28] An interaction variable between public target and all-stock bid also produces an insignificant coefficient.

we form calendar-time portfolios of all-stock and all-cash bidders and hold these for up to three years. A bidder is in the month t portfolio if it has announced the acquisition between month $t - 36$ and t. For each month, we compute the excess portfolio returns (net of the one-month Treasury bill rate) in calendar time. This monthly excess return is then regressed on a four-factor model consisting of the three Fama-French factors (Fama and French, 1993) and momentum (Jegadeesh and Titman, 1993; Carhart, 1997), and a second model where we also add the traded liquidity factor of Pastor and Stambaugh (2003).

Appendix Table 5 reports the portfolio factor loadings and performance estimates (*alpha*) for both equal-weighted (Panel A) and value-weighted (Panel B) portfolios. The alpha estimates are insignificant for all portfolios and in all regression specifications. To increase test power, we form portfolios consisting of bidder firms with either high or low firm-specific pricing errors prior to the bid announcement. The results are shown in Table 14. The first two portfolios, in columns (1) and (2), contain all-stock bidders with firm-specific pricing errors that are either above or below the median. The next two portfolios, in columns (3) and (4), consist of all-cash bidders similarly sorted on the firm-specific pricing error.

The last and most important portfolio, in column (5), is long in all-cash bidders with low *ex ante* pricing errors and short in all-stock bidders with high pricing errors. If the takeover process fails to eliminate the information asymmetry between bidder and target firms—allowing the bidder to pay with overpriced shares—we expect this long-short portfolio return to produce a positive alpha. However, neither this portfolio strategy, nor any of the other four portfolios in Table 14, produce alphas that are significantly different from zero.

7 Conclusion

Opportunities for selling overpriced bidder shares may coexist with expected takeover synergies. Thus, expected takeover synergies and overpriced bidder shares may both be associated with high market valuations of bidder shares and a greater likelihood of observing all-stock financed takeover bids. Previous tests of the hypothesis that bidders opportunistically sell overpriced shares to targets have failed to empirically discriminate between these two factors. We resolve the identification problem by using an instrument which generates cross-sectional variation in bidder market prices and measures of firm-specific pricing errors, and which is exogenous to latent bidder fundamentals driving the payment method choice. We use this instrument to test the prediction that an opportunistic bidder is more likely to pay for the target with bidder shares after a positive exogenous shock to its firm-specific pricing error.

We develop our empirical analysis in three parts. We first build an empirical (cross-sectional) model describing the choice of all-stock financing by public acquirers. This baseline model shows that the all-stock payment method is significantly more frequent among small, non-dividend paying, R&D-intensive growth companies, as well as among companies with relatively low net leverage. Interestingly, these are also the type of companies which the capital structure literature often refer to as cash-strapped firms with relatively high external financing costs. Thus, this part of our analysis suggests that the observed all-stock payment decision in takeover bids resembles as much a standard capital structure choice as an attempt to sell overpriced shares to the target.

In the second part, we add empirical proxies for bidder overvaluation to our baseline choice model. Our approach here is agnostic as we simply import proxies for market mispricing that have proven to be popular in the extant literature. We show that the all-stock payment decision is positively correlated with both industry merger waves and the *uninstrumented* proxies for bidder mispricing. To identify whether this positive correlation is truly driven by market mispricing and not unobservable bidder fundamentals, we instrument the bidder pricing error using price pressure generated by mutual fund flows. While exogenous to bidder fundamentals, under the opportunistic financing hypothesis, this price pressure should increase the likelihood of observing all-stock bids.

We find that greater instrumented pricing errors *lower* rather than increase the probability of observing all-stock payments. The negative correlation is both statistically and economically significant, and it survives a battery of robustness tests. Conditional on the pricing error capturing true mispricing, and given the exogenous nature of the instrument, this evidence strongly rejects the hypothesis that all-stock bidders systematically sell overpriced shares to targets. The rejection may also reflect a failure of the mispricing proxy. The latter possibility is interesting in light of the popularity of using market-based valuation multiples to generate proxies for market mispricing.

In the third and final part of the analysis, we suggest alternative channels for the interesting negative effect of the instrumented bidder pricing errors on the all-stock payment decision. For example, we replace the industry fixed effects with firm-specific industry and location factors that are new to the takeover literature in the context of the payment method choice. We discover that bidders are more likely to offer all-stock as payment when the two firms are highly related and geographically close. A consistent interpretation is that bidders tend to self-select the all-stock financing method when targets are likely to be well informed about the true value of the bidder shares and therefore less concerned with costly adverse selection. The notion that adverse selection may be low in equilibrium offers is also supported by an event-study analysis which fails to find a significantly negative market reaction to all-stock bids.

Since the negative and significant effect of the instrumented pricing error persists after controlling for industry characteristics, we turn to another and perhaps more direct capital structure channel: positive shocks to bidder market prices may cause bidders to be under-leveraged relative to some optimal capital structure target, which reduces the incentive to issue stock. This prediction, which holds whether or not the pricing error measure truly captures bidder mispricing, receives empirical support. We find that the all-stock payment decision is indeed correlated with deviations from both leverage and cash targets, as predicted. In sum, our large-sample evidence does not suggest a particular role for market overpricing in driving the bidder's payment method choice.

An interesting topic for future research is to look at a potential corporate governance channel driving our rejection of the opportunistic financing hypothesis. Since all-stock deals are more likely when the target and bidder firms are of a similar size (shown here), target shareholders following all-stock deals often hold a sizeable block of shares in the merged company and are represented on its board of directors (e.g. Ted Turner in the case of AOL TimeWarner). If such former target shareholders come to believe that the share exchange was executed on unfair terms, they may be in a position to impose significant personal costs on bidder management and directors who continue as top executives in the merged firm. A decision to avoid selling overpriced shares *ex ante* may also be driven by managerial incentives to minimize such costs *ex post*.

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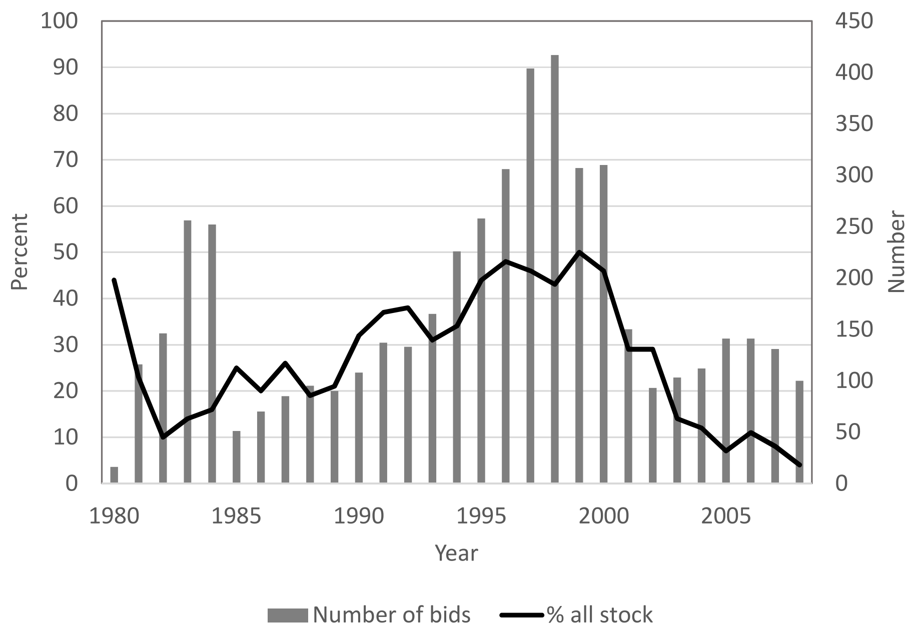
Figure 1
Annual distribution of merger bids and fraction of all-stock mergers, baseline sample 1980-2008

The figure plots the distribution of merger bids and the fraction of all-stock merger bids over the sample period. Panel A shows the frequency and Panel B the value of the merger bids. The sample is 4,919 merger bids from SDC in 1980-2008 that involve U.S targets and U.S. public acquirers.

Panel A: Number of bids and % all stock bids



Panel B: Total bid volume in $ billion and % all-stock bids in value

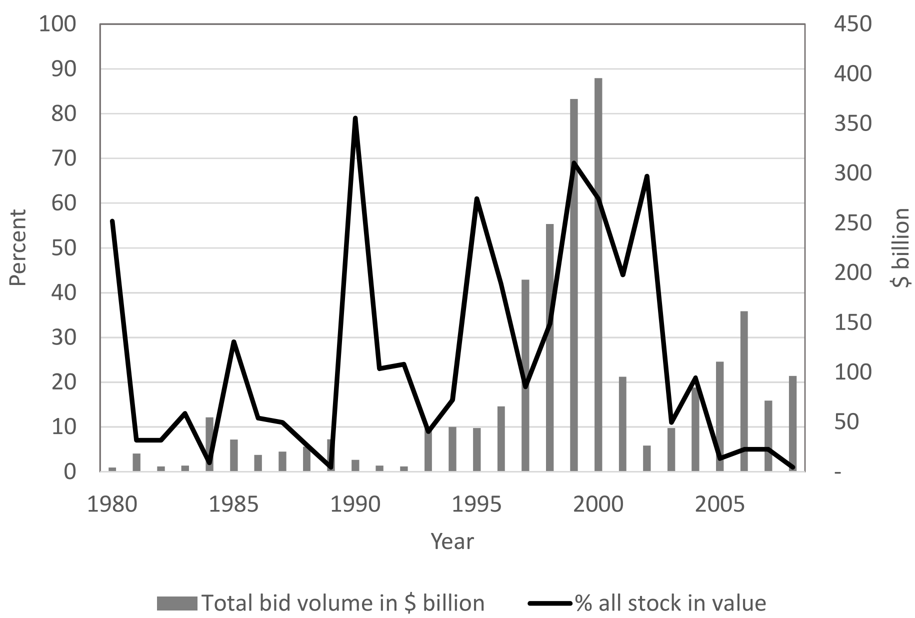


Table 1
Industry-level performance and takeover activity, SDC sample 1980-2008.

This table reports coefficient estimates in cross-sectional regressions of industry-level aggregate takeover activity on industry performance. The sample is 11,394 takeover bids of U.S. public acquirers for U.S. targets in the 1980 to 2008 period (the SDC sample). The dependent variable is the percentage annual growth in the industry's takeover dollar volume (Panel A) and the fraction of the dollar value of all takeover bids in an industry that are paid in all-stock (Panel B). The explanatory variable is the three-year cumulative return on the FF49 industry portfolio of the acquirer (columns (1) to (3)) and of the target (columns (4) to (6)). A constant term is included but not reported. All variables are defined in Appendix Table 1. Numbers in parentheses are t statistics. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Industry return matched on:	Acquirer's FF49 industry			Target's FF49 industry		
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Annual growth of the industry merger dollar volume						
3-year cumulative industry return	0.539	0.519	0.086	0.48	0.531	0.295
	(3.05)***	(2.74)***	(0.39)	(2.83)***	(2.95)***	(1.36)
Industry Fixed Effects		Yes	Yes		Yes	Yes
Year Fixed Effects			Yes			Yes
Adjusted R^2	0.01	-0.04	0.02	0.01	-0.03	0.02
N	801	801	801	820	820	820
Panel B: Fraction of industry merger dollar volume that is all-stock						
3-year cumulative industry return	2.251	3.986	2.973	3.514	3.866	2.918
	(0.90)	(1.63)	(1.03)	(1.45)	(1.63)	(1.04)
Industry Fixed Effects		Yes	Yes		Yes	Yes
Year Fixed Effects			Yes			Yes
Adjusted R^2	0	0.12	0.15	0	0.11	0.16
N	845	845	845	864	864	864

Table 2
Characteristics of takeover bids classified by payment method, baseline sample 1980-2008

The baseline sample is 4,919 takeover bids for U.S targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. The p-value shows the significance of a t-test for the difference in mean.

	Full Sample (N=4,919)			All-stock payment (N= 1,529)		All-cash/mixed payment (N=3,390)		Difference in mean	p-value
	N	Mean	Median	Mean	Median	Mean	Median		
Deal characteristics:									
Completed Deal	4,919	0.826	1	0.854	1	0.813	1	0.041	<0.001
Relative Size	3,759	0.307	0.126	0.395	0.148	0.259	0.119	0.136	<0.001
Public Target	4,919	0.276	0	0.27	0	0.278	0	-0.008	0.544
Bidder characteristics:									
Total Assets (in $ million)	4,919	3,218	376	2,452	282	3,564	436	-1,112	<0.001
Operating Efficiency	4,919	2.369	1.641	2.35	1.711	2.367	1.626	-0.017	0.9297
Market-to-Book Equity	4,919	3.066	1.991	3.85	2.466	2.72	1.849	1.13	<0.001
Dividend Dummy	4,919	0.441	0	0.312	0	0.499	0	-0.187	<0.001
Net Leverage	4,919	0.169	0.178	0.09	0.079	0.203	0.215	-0.113	<0.001
R&D	4,919	0.044	0	0.065	0.018	0.034	0	0.031	<0.001
Asset Tangibility	4,919	0.429	0.343	0.378	0.292	0.453	0.379	-0.075	<0.001
Industry characteristics:									
Vertical Relatedness	4,711	0.052	0.01	0.041	0.015	0.058	0.008	-0.017	0.0049
Complementarity	4,571	0.62	0.614	0.665	0.735	0.6	0.547	0.065	<0.001
High-Tech Dummy	4,919	0.359	0	0.5	1	0.296	0	0.204	<0.001
HHI	4,919	0.077	0.056	0.075	0.055	0.077	0.056	-0.002	0.3233
Top 20% Industry Leaders	4,919	0.447	0	0.458	0	0.442	0	0.017	0.2725
Geographic location:									
Local Deal	2,710	0.155	0	0.189	0	0.139	0	0.05	<0.001
Urban Deal	4,221	0.401	0	0.377	0	0.413	0	-0.036	0.0263
Macro characteristics:									
Industry Wave	4,790	0.47	-0.097	0.664	0.106	0.383	-0.137	0.281	<0.001
Credit Spread	4,919	2.692	2.41	2.569	2.36	2.748	2.41	-0.179	<0.001

Table 3
Baseline probit model for the all-stock payment method choice in takeovers

The table reports the coefficient estimates from probit regressions for the probability of an all-stock merger bid (vs. an all-cash/mixed bid). The explanatory variables are bidder firm characteristics, an industry wave indicator, Moody's credit spread, and deal characteristics. Firm-specific variables are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 4,919 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in paranthesis, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Bidder characteristics:						
Size	-0.014	-0.017	-0.005	-0.021	-0.025	-0.028
	(1.50)	(1.73)*	(0.46)	(2.21)**	(2.50)**	(2.71)***
Operating Efficiency	-0.003	-0.004	-0.005	-0.004	-0.004	-0.004
	(1.05)	(1.15)	(1.59)	(1.15)	(1.34)	(1.18)
Market to Book Equity	0.021	0.019	0.014	0.021	0.02	0.02
	(4.85)***	(4.50)***	(3.13)***	(4.92)***	(4.55)***	(4.62)***
Dividend Dummy	-0.338	-0.231	-0.206	-0.344	-0.234	-0.23
	(7.82)***	(5.10)***	(4.23)***	(7.82)***	(5.10)***	(5.03)***
Net Leverage	-0.558	-0.465	-0.606	-0.579	-0.483	-0.462
	(6.65)***	(5.37)***	(6.58)***	(6.73)***	(5.42)***	(5.20)***
R&D	1.258	0.995	0.979	1.139	0.86	0.846
	(4.73)***	(3.34)***	(3.12)***	(4.15)***	(2.81)***	(2.77)***
Asset Tangibility	-0.091	-0.074	-0.085	-0.066	-0.042	-0.047
	(1.39)	(0.94)	(1.01)	(1.00)	(0.52)	(0.59)
Macro characteristics:						
Industry Wave				0.076	0.078	0.076
				(5.17)***	(5.14)***	(4.99)***
Credit Spread				-0.083	-0.078	-0.076
				(4.58)***	(4.18)***	(4.11)***
Deal characteristics:						
Public Target Dummy						-0.01
						(0.23)
Public Target Dummy x Target Premium						0.06
						(1.11)
Industry Fixed Effects		Yes	Yes		Yes	Yes
Year Fixed Effects			Yes			
Pseudo-R^2	0.06	0.08	0.16	0.07	0.09	0.08
N	4919	4899	4899	4786	4766	4766

Table 4
All-stock choice with five uninstrumented bidder valuation measures

The table reports the coefficient estimates from probit regressions for the probability of an all-stock merger bid (vs. an all-cash/mixed bid). The explanatory variables are the components of market-to-book equity, *Edmans et.al's Discount*, investor sentiment, and control variables from the baseline model in Table 3. The three components of market-to-book equity (*Firm-Specific Error, Time-Series Sector Error,* and *Long-Run Value to Book*) are based on Rhodes-Kropf, Robinson, and Viswanathan (2005). *Edmans et.al's Discount* is based on Edmans, Goldstein, and Jiang (2012). *Sentiment* is the aggregate investor sentiment index from Baker and Wurgler (2006). The firm-specific variables are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 3,900 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
Valuation measures:						
Firm-Specific Error	0.155	0.144	0.17	0.148	0.155	0.158
	(5.93)***	(5.28)***	(5.90)***	(5.01)***	(4.97)***	(4.94)***
Time-Series Sector Error	0.524	0.521	0.384	0.295	0.332	0.296
	(6.58)***	(6.53)***	(4.54)***	(3.44)***	(3.82)***	(3.30)***
Long-Run Value to Book	0.78	0.784	0.781	0.25	0.235	0.115
	(9.09)***	(9.07)***	(8.56)***	(2.31)**	(2.07)**	(0.76)
Edmans et. al's Discount		-0.045	-0.089	-0.111	-0.118	-0.135
		(1.65)*	(2.25)**	(2.45)**	(2.15)**	(2.33)**
Sentiment			0.195	0.097	0.066	0.063
			(3.68)***	(1.71)*	(1.10)	(1.02)
Bidder characteristics:						
Size				-0.019	-0.023	-0.031
				(1.44)	(1.66)*	(2.02)**
Operating Efficiency				-0.001	-0.002	-0.002
				(0.39)	(0.41)	(0.61)
Dividend Dummy				-0.307	-0.33	-0.235
				(5.95)***	(6.28)***	(4.28)***
Net Leverage				-0.735	-0.797	-0.767
				(7.39)***	(7.79)***	(7.03)***
R&D				0.624	0.508	0.619
				(1.98)**	(1.58)	(1.68)*
Asset Tangibility				-0.077	-0.048	-0.038
				(0.99)	(0.61)	(0.39)
Macro characteristics:						
Industry Wave					0.034	0.036
					(1.92)*	(1.96)*
Credit Spread					-0.15	-0.137
					(6.20)***	(5.51)***
Industry Fixed Effects						Yes
Pseudo R^2	0.03	0.03	0.03	0.07	0.09	0.10
N	3900	3900	3540	3540	3445	3420

Table 5
Mutual fund flow as determinant of bidder market-to-book ratio and firm-specific error

The table reports the coefficient estimates from the first-stage IV regressions for M/B (columns (1) t0 (4))and *Firm-Specific Error* (columns (5) to (8)). The explanatory variables are *Mutual Fund Flow* (price pressure from mutual fund flows), *Sales Rank, Market Share*, and other control variables from the baseline model in Table 3. *Firm-Specific Error* of market-to-book equity is based on Rhodes-Kropf, Robinson, and Viswanathan (2005). All firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 3,900 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. The t-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Dependent variable:	Market-to-Book				Firm-Specific Error			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Instrument:								
Mutual Fund Flow	0.011	0.011	0.011	0.011	0.003	0.018	0.018	0.017
	(3.40)***	(3.29)***	(3.19)***	(3.24)***	(7.49)***	(4.17)***	(4.02)***	(4.00)***
Bidder characteristics:								
Sales Rank		0.578	0.541	0.421		0.662	0.653	0.64
		(2.05)**	(1.87)*	(1.41)		(12.25)***	(11.91)***	(11.49)***
Market Share		0.997	1.697	1.635		1.502	1.617	1.635
		(1.09)	(1.56)	(1.30)		(3.51)***	(3.71)***	(3.37)***
Operating Efficiency		0.012	0.012	0.01		0	-0.001	-0.001
		(0.50)	(0.44)	(0.39)		(0.03)	(0.23)	(0.22)
Dividend Dummy		-0.33	-0.322	-0.137		-0.019	-0.013	-0.009
		(2.06)**	(1.97)**	(0.80)		(0.61)	(0.41)	(0.27)
Net Leverage		-0.465	-0.478	-0.29		0.224	0.203	0.285
		(1.30)	(1.28)	(0.80)		(3.02)***	(2.68)***	(3.77)***
R&D		8.502	8.754	8.096		1.853	1.878	1.747
		(4.31)***	(4.32)***	(3.41)***		(6.74)***	(6.72)***	(5.43)***
Asset Tangibility		-0.796	-0.757	-0.335		-0.096	-0.087	-0.014
		(3.22)***	(3.01)***	(0.95)		(2.00)**	(1.80)*	(0.21)
Macro characteristics:								
Industry Wave			0.102	0.112			-0.019	-0.021
			(2.00)**	(2.11)**			(1.75)*	(1.85)*
Credit Spread			-0.04	-0.043			-0.015	-0.014
			(0.67)	(0.70)			(1.21)	(1.15)
Industry Fixed Effects				Yes				Yes
R^2	0.01	0.04	0.05	0.07	0.01	0.10	0.10	0.13
N	4919	4896	4764	4744	3900	3900	3803	3784

Table 6
All-stock choice with instrumented bidder market-to-book ratio

The table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The explanatory variables are *M/B, Sales Rank, Market Share*, and other control variables from the baseline model in Table 3. Columns (1) to (4) show the estimates from regular probit regressions. In columns (5) to (8), *M/B* is instrumented by price pressure from mutual fund flows, estimated in Table 5. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 4,919 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

Market-to-Book:	Uninstrumented				Instrumented			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Valuation measures:								
Market-to-Book	0.03	0.022	0.022	0.02	-0.166	-0.152	-0.159	-0.168
	(6.87)***	(5.00)***	(5.04)***	(4.61)***	(7.10)***	(4.45)***	(4.98)***	(5.79)***
Bidder characteristics:								
Sales Rank		-0.223	-0.216	-0.289		-0.028	-0.018	-0.073
		(3.28)***	(3.08)***	(3.99)***		(0.33)	(0.22)	(0.84)
Market Share		-0.287	-0.278	0.558		0.029	0.191	0.763
		(0.56)	(0.47)	(0.84)		(0.08)	(0.47)	(1.71)*
Operating Efficiency		-0.003	-0.003	-0.004		0	0	-0.001
		(0.95)	(1.06)	(1.24)		(0.01)	(0.05)	(0.12)
Dividend Dummy		-0.315	-0.331	-0.231		-0.257	-0.256	-0.157
		(7.28)***	(7.49)***	(4.98)***		(4.78)***	(4.50)***	(3.08)***
Net Leverage		-0.593	-0.615	-0.52		-0.472	-0.47	-0.366
		(7.03)***	(7.06)***	(5.79)***		(4.39)***	(4.14)***	(3.39)***
R&D		1.21	1.117	0.739		2.201	2.198	1.882
		(4.52)***	(4.05)***	(2.41)**		(6.42)***	(6.04)***	(4.29)***
Asset Tangibility		-0.067	-0.042	0.013		-0.182	-0.162	-0.06
		(1.02)	(0.64)	(0.16)		(3.11)***	(2.74)***	(0.77)
Macro characteristics:								
Industry Wave			0.073	0.074			0.027	0.023
			(4.98)***	(4.83)***			(1.44)	(1.20)
Credit Spread			-0.082	-0.077			-0.059	-0.055
			(4.52)***	(4.15)***			(3.03)***	(2.88)***
Industry Fixed Effects				Yes				Yes
Exogeneity tests :								
Wald Statistic					17.36	9.85	10.73	12.36
p-value					<0.001	<0.001	<0.001	<0.001
Weak Instrument tests :								
F Statistic					22.01	20.98	19.89	18.46
p-value					<0.001	<0.001	<0.001	<0.001
N	4919	4896	4764	4744	4919	4896	4764	4744

Table 7
All-stock choice with instrumented bidder firm-specific valuation error

The table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The explanatory variables are *Firm-Specific Error, Sales Rank, Market Share*, and other control variables from the baseline model in Table 3. *Firm-Specific Error* is based on the Rhodes-Kropf, Robinson, and Viswanathan (2005) decomposition of M/B. Columns (1) to (4) show the estimates from regular probit regressions. In columns (5) to (8), *Firm-Specific Error* is instrumented by price pressure from mutual fund flows, estimated in Table 5. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 3,900 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Firm-specific Error:	Uninstrumented				Instrumented			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Valuation measures:								
Firm-specific Error	0.129	0.158	0.166	0.171	-0.824	-0.924	-0.944	-0.966
	(5.29)***	(5.95)***	(6.09)***	(6.16)***	(9.99)***	(7.90)***	(8.33)***	(8.80)***
Bidder characteristics:								
Sales Rank		-0.292	-0.28	-0.333		0.537	0.553	0.53
		(3.88)***	(3.65)***	(4.18)***		(4.38)***	(4.66)***	(4.38)***
Market Share		-1.5	-1.787	-1.366		0.889	0.927	1.451
		(1.91)*	(2.27)**	(1.58)		(1.30)	(1.32)	(1.91)*
Operating Efficiency		-0.001	-0.001	-0.002		-0.001	-0.002	-0.002
		(0.35)	(0.32)	(0.53)		(0.18)	(0.40)	(0.47)
Dividend Dummy		-0.282	-0.302	-0.222		-0.159	-0.157	-0.112
		(5.80)***	(6.10)***	(4.31)***		(2.98)***	(2.80)***	(2.21)**
Net Leverage		-0.779	-0.816	-0.772		-0.189	-0.209	-0.091
		(8.31)***	(8.49)***	(7.62)***		(1.28)	(1.38)	(0.60)
R&D		0.72	0.578	0.512		2.227	2.202	2.067
		(2.53)**	(1.99)**	(1.56)		(7.45)***	(7.08)***	(5.86)***
Asset Tangibility		-0.06	-0.02	0.079		-0.132	-0.103	0.022
		(0.82)	(0.27)	(0.87)		(2.14)**	(1.66)*	(0.26)
Macro characteristics:								
Industry Wave			0.076	0.073			0.018	0.013
			(4.68)***	(4.30)***			(0.99)	(0.70)
Credit Spread			-0.059	-0.053			-0.047	-0.043
			(2.93)***	(2.59)***			(2.76)***	(2.53)**
Industry Fixed Effects				Yes				Yes
Exogeneity tests :								
Wald Statistic					41.55	19.27	19.73	20.78
p-value					<0.001	<0.001	<0.001	<0.001
Weak Instrument tests:								
F-Statistic					48.35	14.73	10.783	11.223
p-value					<0.001	<0.001	<0.001	<0.001
N	3900	3900	3803	3784	3900	3900	3803	3784

Table 8
The choice of all-stock v. all-cash with instrumented bidder valuation error and bidder $M/B >$ target M/B

The table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The sample is restricted to all-stock and all-cash bids, excluding mixed offers (columns (1) to (4)), and to merger bids with acquirer M/B greater than target M/B (columns (5) to (8)). The explanatory variables are *Firm-specific Error, Sales Rank, Market Share*, and control variables from the baseline model in Table 3. *Firm-Specific Error* is computed following Rhodes-Kropf, Robinson, and Viswanathan (2005). In columns (3) to (4) and (7) to (8), *Firm-specific Error* is instrumented by price pressure from mutual fund flows. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

Sample:	All-stock and All-cash bids				Bidder M/B > Target M/B			
Firm-specific Error:	Uninstrumented		Instrumented		Uninstrumented		Instrumented	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Valuation measures:								
Firm-specific Error	0.109	0.136	-1.090	-1.105	0.115	0.155	-1.437	-1.608
	(3.01)***	(3.43)***	(11.65)***	(12.08)***	(1.58)	(1.78)*	(13.92)***	(13.14)***
Bidder characteristics:								
Sales Rank	-0.821	-0.818	0.413	0.355	-0.189	-0.392	0.685	0.8
	(7.92)***	(7.20)***	(2.26)**	(2.08)**	(0.96)	(1.73)*	(3.58)***	(3.54)***
Market Share	-2.158	-2.978	1.205	1.793	-2.028	-2.659	2.972	6.188
	(2.11)**	(2.47)**	(1.58)	(1.97)**	(1.20)	(1.21)	(2.71)***	(3.84)***
Operating Efficiency	-0.004	-0.008	0.008	0.005	0.013	0.006	0.006	0.017
	(0.77)	(1.41)	(1.28)	(0.71)	(1.27)	(0.49)	(0.41)	(1.16)
Dividend Dummy	-0.421	-0.349	-0.19	-0.163	-0.168	-0.015	-0.113	-0.056
	(6.80)***	(5.07)***	(2.52)**	(2.32)**	(1.45)	(0.11)	(1.15)	(0.53)
Net Leverage	-0.957	-1.021	-0.3	-0.245	-0.876	-0.897	0.367	0.204
	(6.94)***	(6.79)***	(1.66)*	(1.28)	(3.45)***	(3.01)***	(1.24)	(0.63)
R&D	0.707	0.936	1.816	1.669	2.202	2.293	2.648	2.708
	(1.54)	(1.65)*	(4.91)***	(3.72)***	(2.60)***	(2.22)**	(3.20)***	(2.74)***
Asset Tangibility	-0.013	0.053	-0.049	0.166	0.218	0.209	-0.002	0.049
	(0.13)	(0.41)	(0.61)	(1.53)	(1.37)	(0.88)	(0.02)	(0.29)
Macro characteristics:								
Industry Wave		0.094		0.009		0.048		-0.005
		(3.62)***		(0.35)		(1.10)		(0.14)
Credit Spread		-0.033		-0.034		-0.082		-0.09
		(1.08)		(1.52)		(1.49)		(2.07)**
Industry Fixed Effects		Yes		Yes		Yes		Yes
Exogeneity Tests :								
Wald Statistic			17.28	20.49			3.08	3.35
p-value			<0.001	<0.001			<0.001	<0.001
Weak Instrument Tests :								
F Statistic			7.05	6.39			0.08	0.60
p-value			0.010	0.010			0.776	0.440
N	2191	2129	2191	2129	677	623	677	623

Table 9
The all-stock choice with instrumented bidder firm-specific error, conditional on the sign of the mutual fund flow

The table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The explanatory variables are *Firm-specific Error, Sales Rank, Market Share*, and control variables from the baseline model in Table 3. *Firm-Specific Error* is computed following Rhodes-Kropf, Robinson, and Viswanathan (2005). In columns (1) and (2), positive *Firm-specific Error* is instrumented with mutual fund inflows ($Z = Z_{it}$ for $Z_{it} > 0$ and else $Z = 0$). In columns (5) and (6), the three endogenous variables are instrumented as follows: Positive *Firm-specific Error* is instrumented with mutual fund inflow ($Z = Z_{it}$ for $Z_{it} > 0$, otherwise $Z = 0$). Negative *Firm-specific Error* is instrumented with mutual fund outflow ($Z = Z_{it}$ for $Z_{it} < 0$, otherwise $Z = 0$). *Positive Error*, a dummy for *Firm-Specific Error*> 0, is instrumented with a positive mutual fund flow dummy ($Z = 1$ for $Z_{it} > 0$, and else $Z = 0$). Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 3,900 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Instrument: Inflow		Uninstrumented		Instruments: Inflow and outflow	
	(1)	(2)	(3)	(4)	(5)	(6)
Valuation measures:						
Firm-specific Error	-0.924	-0.967				
	(7.91)***	(8.81)***				
Firm-specific Error			0.168	0.160	-4.605	-5.919
* Positive Error			(3.75)***	(3.49)***	(1.34)	(1.46)
Firm-specific Error			0.064	0.115	-6.205	-5.013
* (1-Positive Error)			(1.00)	(1.57)	(1.07)	(0.95)
Positive Error			0.075	0.073	9.805	9.627
			(1.14)	(1.05)	(1.10)	(1.20)
Bidder characteristics:						
Sales Rank	0.538	0.530	-0.288	-0.336	-0.060	-0.322
	(4.39)***	(4.38)***	(3.76)***	(4.15)***	(0.08)	(0.43)
Market Share	0.890	1.452	-1.581	-1.412	-5.213	-2.129
	(1.30)	(1.91)*	(1.99)**	(1.63)	(0.81)	(0.42)
Operating Efficiency	-0.001	-0.002	-0.001	-0.002	0.007	0.008
	(0.18)	(0.47)	(0.32)	(0.50)	(0.58)	(0.55)
Dividend Dummy	-0.159	-0.112	-0.282	-0.223	-0.361	-0.322
	(2.98)***	(2.20)**	(5.79)***	(4.33)***	(2.19)**	(1.94)*
Net Leverage	-0.188	-0.091	-0.779	-0.769	0.320	0.684
	(1.27)	(0.60)	(8.32)***	(7.58)***	(0.39)	(0.69)
R&D	2.228	2.067	0.713	0.516	5.032	5.740
	(7.45)***	(5.86)***	(2.50)**	(1.58)	(1.75)*	(1.71)*
Asset Tangibility	-0.132	0.022	-0.055	0.080	-0.084	0.205
	(2.14)**	(0.26)	(0.76)	(0.88)	(0.29)	(0.71)
Macro characteristics:						
Industry Wave		0.013		0.072		-0.023
		(0.70)		(4.27)***		(0.28)
Credit Spread		-0.043		-0.053		-0.108
		(2.53)**		(2.56)**		(1.18)
Industry Fixed Effects		Yes		Yes		Yes
Exogeneity Tests :						
Wald Statistic	19.29	20.78			15.54	16.56
p-value	<0.001	<0.001			<0.001	<0.001
Weak Instrument Tests :						
F Statistic	14.82	11.24			9.81;5.69;6.35[a]	7.10;6.60;6.59[a]
p-value	<0.001	<0.001			<0.001	<0.001
N	3900	3784	3900	3784	3900	3784

[a] There are three reported F-statistics, one for each of three instruments: (1) mutual fund inflow ($Z = Z_{it}$ if $Z_{it} > 0$ and $Z = 0$ otherwise), (2) mutual fund outflow ($Z = Z_{it}$ if $Z_{it} < 0$ and $Z = 0$ otherwise), and (3) positive mutual fund flow dummy ($Z = 1$ if $Z_{it} > 0$ and $Z = 0$ otherwise).

Table 10
All-stock choice with instrumented bidder firm-specific error and industry characteristics

The table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The explanatory variables are *Firm-specific Error*, industry characteristics, *Sales Rank, Market Share*, and other control variables from the baseline model in Table 3. *Sales Rank, Market Share, Dividend, R&D*, and *Leverage* are replaced with the components (fitted residuals) orthogonal to the industry characteristics. In columns (1) to (3), the estimates are from regular probit regressions. In columns (4) to (6), *Firm-specific Error* is instrumented by price pressure from mutual fund flows. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 3,629 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively

Firm-specific Error:	Uninstrumented			Instrumented		
	(1)	(2)	(3)	(4)	(5)	(6)
Valuation measures:						
Firm-specific Error	0.122	0.158	0.162	-0.975	-1.018	-1.034
	(4.71)***	(5.75)***	(5.75)***	(12.77)***	(11.17)***	(11.66)***
Industry characteristics:						
Vertical Relatedness	-0.843	-0.721	-0.614	-0.245	0.047	-0.073
	(1.83)*	(1.45)	(1.21)	(0.71)	(0.13)	(0.20)
Complementarity	0.203	0.196	0.19	0.163	0.144	0.146
	(2.92)***	(2.71)***	(2.59)***	(2.80)***	(2.40)**	(2.43)**
High-Tech Dummy	0.43	0.455	0.439	0.317	0.287	0.29
	(9.68)***	(9.25)***	(8.74)***	(6.05)***	(4.49)***	(4.68)***
HHI	-0.139	-0.319	-0.191	-0.203	-0.208	0.081
	(0.45)	(0.98)	(0.48)	(0.67)	(0.67)	(0.25)
Top 20% Industry Leaders	-0.069	-0.091	-0.108	0.339	0.352	0.371
	(1.55)	(1.96)*	(2.29)**	(6.99)***	(6.56)***	(6.68)***
Bidder characteristics:						
Sales Rank		-0.466	-0.444		0.466	0.464
		(5.38)***	(5.00)***		(3.72)***	(3.82)***
Market Share		-2.101	-2.264		0.616	0.594
		(2.31)**	(2.53)**		(0.90)	(0.87)
Operating Efficiency		-0.001	-0.001		-0.001	-0.003
		(0.37)	(0.23)		(0.33)	(0.60)
Dividend Dummy		-0.303	-0.327		-0.136	-0.134
		(5.86)***	(6.22)***		(2.42)**	(2.26)**
Net Leverage		-0.793	-0.832		-0.082	-0.107
		(7.90)***	(8.06)***		(0.57)	(0.72)
R&D		0.225	0.166		2.083	2.065
		(0.74)	(0.54)		(5.96)***	(5.76)***
Asset Tangibility		0.013	0.044		-0.092	-0.054
		(0.16)	(0.53)		(1.36)	(0.79)
Macro characteristics:						
Industry Wave			0.071			0.005
			(4.18)***			(0.31)
Credit Spread			-0.049			-0.038
			(2.35)**			(2.29)**
Exogeneity Tests :						
Wald Statistic				32.5	21.7	21.47
p-value				<0.001	<0.001	<0.001
Weak Instrument Tests :						
F Statistic				19.03	10.31	9.4
p-value				<0.001	<0.001	<0.001
N	3629	3629	3536	3629	3629	3536

Table 11
The all-stock choice and bidder and target geographic location

This table reports the coefficient estimates from probit regressions for the choice of all-stock merger bids vs. all-cash/mixed bids. The explanatory variables are *Local Deal, Urban Deal*, industry characteristics, and control variables from the baseline model in Table 3. *Local Deal* indicates that the acquirer and target are located within 30 miles. *Urban Deal* indicates that the acquirer is located within 30 miles from one of the ten largest metropolitan areas. If the target or acquirer zip code is missing in SDC, *Local Deal* is set to zero (columns (1) to (3) and (7) to (8)) or the observation is eliminated (columns (4) to (6)). *Vertical Relatedness* and *Complementarity* are based on Fan and Lang (2000). *High-tech Dummy* indicates that the acquirer is in a high-tech industry according to American Electronic Association. HHI is the Herfindahl Hirschman Index. *Top 20% Industry Leaders* indicates that the acquirer's total assets are in the largest quintile in its FF49 industry. In column (8), *Size, Dividend, R&D*, and *Leverage* are replaced with the components (fitted residuals) orthogonal to industry variables. Also estimated, but not reported, is a constant term. The sample is 4,919 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Rule for Missing Zip Code:	Local Dummy=0			Observation is Excluded			Local Dummy=0	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Geographic Location:								
Local Deal	0.275	0.194	0.176	0.22	0.162	0.147	0.191	0.195
	(4.23)***	(2.81)***	(2.54)**	(3.25)***	(2.30)**	(2.05)**	(2.80)***	(2.74)***
Urban Deal	-0.044	-0.022	-0.027	-0.085	-0.044	-0.033	-0.001	0.021
	(1.12)	(0.53)	(0.65)	(1.66)*	(0.83)	(0.60)	(0.03)	(0.48)
Industry characteristics:								
Vertical Relatedness							-0.471	-0.232
							(1.15)	(0.52)
Complementarity							0.228	0.19
							(3.67)***	(2.89)***
High-Tech Dummy							0.521	0.497
							(12.83)***	(10.89)***
HHI							-0.309	0.016
							(1.11)	(0.04)
Top 20% Industry Leaders							-0.003	-0.035
							(0.07)	(0.85)
Bidder Characteristics:								
Size		-0.021	-0.024		-0.047	-0.052		-0.073
		(2.17)**	(2.42)**		(3.55)***	(3.77)***		(5.38)***
Operating Efficiency		-0.004	-0.004		0	-0.002		-0.003
		(1.12)	(1.30)		(0.04)	(0.37)		(1.00)
Market to Book Equity		0.021	0.02		0.026	0.026		0.019
		(4.93)***	(4.56)***		(4.43)***	(4.55)***		(4.29)***
Dividend Dummy		-0.339	-0.231		-0.234	-0.162		-0.319
		(7.70)***	(5.03)***		(3.98)***	(2.65)***		(6.73)***
Net Leverage		-0.577	-0.483		-0.473	-0.397		-0.496
		(6.73)***	(5.44)***		(4.30)***	(3.40)***		(5.52)***
R&D		1.096	0.828		0.945	0.804		0.465
		(3.99)***	(2.70)***		(2.70)***	(2.03)**		(1.57)
Asset Tangibility		-0.07	-0.042		0.054	0.085		-0.03
		(1.06)	(0.52)		(0.62)	(0.79)		(0.41)
Macro Characteristics:								
Industry Wave		0.075	0.077		0.077	0.078		0.074
		(5.13)***	(5.11)***		(3.99)***	(3.90)***		(4.87)***
Credit Spread		-0.084	-0.078		-0.055	-0.043		-0.079
		(4.63)***	(4.21)***		(2.35)**	(1.77)*		(4.19)***
Industry Fixed Effects			Yes			Yes		
Pseudo R^2	0	0.07	0.09	0	0.06	0.08	0.04	0.08
N	4919	4786	4766	2704	2629	2605	4567	4441

Table 12
The all-stock choice and capital structure

The table reports the coefficient estimates from probit regressions for the choice of all-stock vs. all-cash/mixed bids. The explanatory variables are capital structure characteristics, *Large Deal Dummy*, and control variables from the baseline model in Table 3. *Leverage* is market leverage (columns (1) to (4)) and book leverage (columns (5) to (8)). *Deviation from Target Leverage* is based on Harford, Klasa, and Walcott (2009) and the estimated coefficients are shown in Appendix Table 4. *Stock Issue Dummy* indicates that the acquirer does an SEO in year of (t), or the year prior to ($t-1$), the merger. *Large Deal Dummy* indicates that the ratio of deal value to acquirer total assets is in the top quartile. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 4,708 merger bids for U.S. targets by U.S. public acquirers in 1980-2008. All variables are defined in Appendix Table 1. Z-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Leverage:	Market Leverage				Book Leverage			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Capital structure characteristics:								
Leverage	-1.326	-1.32	-1.497	-1.621	-0.563	-0.685	-0.793	-0.887
	(9.34)***	(8.97)***	(9.78)***	(10.09)***	(3.90)***	(4.36)***	(4.71)***	(5.00)***
Deviation from Target Leverage	1.191	1.133	1.404	1.48	0.43	0.472	0.637	0.748
	(5.44)***	(5.17)***	(6.20)***	(6.33)***	(1.89)*	(1.97)**	(2.38)**	(2.74)***
Cash Holding	2.568	0.859	0.459	-0.831	3.51	1.701	1.422	0.007
	(8.24)***	(1.98)**	(1.02)	(1.51)	(11.82)***	(3.98)***	(3.20)***	(0.01)
Excess Cash	-2.079	-0.497	-0.137	1.143	-2.825	-1.163	-0.914	0.502
	(6.04)***	(1.12)	(0.30)	(2.06)**	(8.52)***	(2.67)***	(2.02)**	(0.92)
Stock Issue Dummy$_t$		0.138	0.122	0.093		0.153	0.145	0.122
		(2.30)**	(2.00)**	(1.50)		(2.58)***	(2.39)**	(1.98)**
Stock Issue Dummy$_{t-1}$		0.314	0.309	0.274		0.331	0.327	0.289
		(5.10)***	(4.95)***	(4.32)***		(5.43)***	(5.31)***	(4.62)***
Deal characteristics:								
Large Deal Dummy		0.306	0.264	0.285		0.288	0.251	0.268
		(6.12)***	(5.13)***	(5.44)***		(5.78)***	(4.90)***	(5.14)***
Bidder characteristics:								
Size		-0.009	-0.02	-0.031		-0.003	-0.012	-0.026
		(0.94)	(1.86)*	(2.78)***		(0.28)	(1.12)	(2.33)**
Operating Efficiency		-0.002	-0.002	-0.004		-0.002	-0.003	-0.004
		(0.59)	(0.72)	(1.03)		(0.77)	(0.95)	(1.17)
Market to Book Equity		0.017	0.018	0.017		0.022	0.023	0.023
		(3.86)***	(4.03)***	(3.80)***		(4.87)***	(5.04)***	(4.95)***
Dividend Dummy		-0.264	-0.281	-0.205		-0.261	-0.277	-0.208
		(5.63)***	(5.88)***	(4.22)***		(5.62)***	(5.88)***	(4.33)***
R&D		0.774	0.777	1.015		0.852	0.857	1.027
		(2.49)**	(2.39)**	(2.84)***		(2.68)***	(2.58)***	(2.84)***
Asset Tangibility		-0.039	-0.023	-0.091		-0.01	0.01	-0.058
		(0.56)	(0.33)	(1.02)		(0.15)	(0.14)	(0.66)
Macro characteristics:								
Industry Wave			0.068	0.073			0.066	0.073
			(4.41)***	(4.59)***			(4.35)***	(4.64)***
Credit Spread			-0.079	-0.075			-0.06	-0.056
			(4.12)***	(3.78)***			(3.17)***	(2.87)***
Industry Fixed Effects				Yes				Yes
Pseudo R^2	0.07	0.09	0.1	0.12	0.05	0.07	0.08	0.1
N	4699	4699	4572	4552	4708	4708	4581	4561

Table 13
Determinants of bidder announcement-period abnormal stock returns

The table reports coefficient estimates from OLS regressions for the acquirer announcement-period abnormal returns in event days [-1,1], estimated from a market model. The explanatory variables are *All-Stock Dummy*, valuation measures and their interactions, a public target dummy, and other control variables from the baseline model in Table 3. Firm characteristics are lagged by one year. Also estimated, but not reported, is a constant term. The sample is 4,442 merger bids for U.S. targets by U.S. public acquirers in 1980-2008. All variables are defined in Appendix Table 1. The t-statistics are in parentheses, using robust standard errors. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Payment method and valuation measures:								
All Stock Dummy	0.22	0.679	0.266	0.809	0.364	0.706	0.232	0.756
	(0.57)	(1.29)	(0.53)	(1.59)	(0.88)	(1.32)	(0.46)	(1.47)
Market to Book Equity		0.059				0.054		
		(1.10)				(1.01)		
All Stock x Market to Book		-0.047				-0.056		
		(0.56)				(0.68)		
Firm-Specific Error			-0.056				-0.118	
			(0.16)				(0.34)	
All Stock x Firm-Specific Error			0.299				0.222	
			(0.44)				(0.33)	
Edmans et al's Discount				1.837				1.845
				(1.68)*				(1.68)*
All Stock x Discount				-2.769				-2.779
				(1.43)				(1.44)
Deal characteristics:								
Public Target		-0.492	-0.601	-0.57		-0.476	-0.598	-0.556
		(1.40)	(1.39)	(1.32)		(1.33)	(1.36)	(1.27)
Bidder characteristics:								
Size		-0.703	-0.76	-0.662		-0.678	-0.743	-0.654
		(6.14)***	(6.15)***	(5.04)***		(5.99)***	(5.74)***	(4.80)***
Operating Efficiency		-0.002	-0.026	-0.025		-0.007	-0.034	-0.032
		(0.06)	(0.74)	(0.71)		(0.21)	(0.95)	(0.88)
Dividend Dummy		0.663	0.924	0.915		0.646	0.934	0.904
		(1.71)*	(2.23)**	(2.20)**		(1.52)	(2.16)**	(2.08)**
Net Leverage		3.825	3.298	3.225		3.719	3.055	3.068
		(2.88)***	(3.11)***	(3.13)***		(2.64)***	(2.61)***	(2.67)***
R&D		-0.278	-1.154	-0.475		1.241	0.019	0.522
		(0.10)	(0.41)	(0.17)		(0.40)	(0.01)	(0.17)
Asset Tangibility		-0.449	-0.456	-0.353		-0.916	-0.432	-0.378
		(0.84)	(0.88)	(0.68)		(1.17)	(0.62)	(0.56)
Macro characteristics:								
Industry Wave		-0.132	-0.311	-0.326		-0.122	-0.314	-0.32
		(0.87)	(2.13)**	(2.20)**		(0.79)	(2.09)**	(2.10)**
Credit Spread		0.109	0.083	0.112		0.145	0.116	0.155
		(0.82)	(0.52)	(0.69)		(1.06)	(0.72)	(0.94)
Industry Fixed Effects					Yes	Yes	Yes	Yes
R^2	0	0.03	0.03	0.04	0.02	0.04	0.04	0.05
N	4442	4324	3426	3426	4442	4324	3426	3426

Table 14
Acquirer post-merger returns for high and low firm-specific error

The table reports the coefficient estimates from calendar time portfolio regressions. The dependent variable is the monthly return on portfolios of acquirers sorted by payment method (all-stock vs. all-cash) and firm-specific pricing error (top vs. bottom half). An acquirer will be in month t portfolio if it has announced the acquisition between month t-36 and t. The explanatory variables are the Fama-French three factors (R_m, SMB and HML) and momentum (UMD). Rm is excess return on the market. SMB is the average return on small minus large stock portfolios. HML is the average return on value minus growth portfolios. UMD is the average return on up minus down portfolios. The monthly returns on acquirer portfolios are equal-weighted in Panel A and value-weighted in panel B. The sample is 4,919 merger bids for U.S. targets by U.S. public acquirers in the 1980 to 2008 period. All variables are defined in Appendix Table 1. t-statistics are in parentheses and standard errors are robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Payment method:	All-Stock		All-Cash		Long All-Cash/Low Error, Short All-Stock/High Error
Firm-Specific Error:	High	Low	High	Low	
	(1)	(2)	(3)	(4)	(5)
Panel A: Equal-weighted returns					
alpha	-0.187	-0.436	-0.074	0.148	0.328
	(0.76)	(1.16)	(0.54)	(0.78)	(1.11)
Risk Factors:					
Rm	1.139	1.087	0.979	1.089	-0.084
	(20.79)***	(12.82)***	(32.04)***	(25.72)***	(1.27)
SMB	0.793	1.189	0.558	0.658	-0.182
	(9.35)***	(9.15)***	(11.78)***	(10.11)***	(1.79)*
HML	-0.422	-0.023	-0.062	0.238	0.624
	(4.90)***	(0.17)	(1.28)	(3.55)***	(5.98)***
UMD	-0.457	-0.294	-0.303	0.055	0.476
	(7.04)***	(2.89)***	(8.34)***	(1.07)	(6.01)***
R^2	0.71	0.51	0.83	0.73	0.17
N	381	376	382	373	373
Panel B: Value-weighted returns					
alpha	-0.184	-0.202	0.224	0.022	0.192
	(1.19)	(0.71)	(1.64)	(0.11)	(0.76)
Risk Factors:					
Rm	1.03	1.132	0.954	1.108	0.062
	(29.77)***	(17.63)***	(31.32)***	(23.72)***	(1.09)
SMB	-0.109	0.182	-0.126	0.048	0.118
	(2.03)**	(1.85)*	(2.66)***	(0.67)	(1.36)
HML	-0.514	0.203	-0.307	0.043	0.527
	(9.43)***	(2.01)**	(6.40)***	(0.58)	(5.88)***
UMD	-0.179	0.102	-0.216	0.168	0.311
	(4.37)***	(1.33)	(5.96)***	(3.00)***	(4.59)***
R^2	0.77	0.49	0.78	0.64	0.09
N	381	376	382	373	373

Appendix Table 1: Variable Definitions

Variable name	Source	Variable definition
A. Deal characteristics		
All-Stock Bid	SDC	Consideration structure is SHARES
All-Cash Bid	SDC	Consideration structure is CASHO
Mixed Offer	SDC	Consideration structure is HYBRID or OTHER
Completed Deal	SDC	Deal Status in SDC is equal to "Completed"
Public Target	SDC	Target public status is "Public"
Target Premium	SDC	Offered price in percent of target stock price four weeks prior to deal announcement
B. Bidder characteristics		
Size	Compustat	Natural log of total assets
Sales Rank	Compustat	The rank of sales among all Compustat firms in the acquirer's FF49 industry
Market Share	Compustat	Total assets divided by the sum of total assets for all Compustat firms in the acquirer's FF49 industry
Operating Efficiency	Compustat	(Cost of goods sold + expense)/Net operating assets, (Net operating assets=Properties, plants and equipment + Total Current Assets - Cash -Total Current Liabilities
Dividend Dummy	Compustat	A dummy taking the value of 1 if total dividends are greater than 0
R&D	Compustat	R&D Expense/Total Assets
Asset Tangibility	Compustat	Properties, Plants and Equipment/ Total Assets
C. Firm valuation		
Market to Book Equity	Compustat	(Closing price x number of shares outstanding)/ (Total assets - Total liabilities)
Firm-specific Error	Authors' calculation	Based on Rhodes Kropf, Robinson, and Visvanathan (2005), Firm-specific error=Market Value - Fundamental value based on sector pricing rule in year t; Fundamental value based on industry pricing rule in year t is the fitted firm market value from the regression: Market value = $\beta_0 + \beta_1$ (Book Value) + β_2 (Operating Cash Flow) + β_3 (Net Leverage) + e where β's are estimated from all Compustat firms in the same FF16 industries in year t.
Time-Series Sector Error	Authors' calculation	Based on Rhodes-Kropf, Robinson, and Viswanathan (2005), Time-series sector error = Fundamental value based on sector pricing rule in year t - Fundamental value based on long-run sector pricing rule; Fundamental value based on long-run industry pricing rule is the firm's market value from the following equation: Market value = average β_0 + average β_1 (Book Value) + average β_2 (Operating Cash Flow) + average β_3 (Net Leverage) where average β's are the long-run averages of β's across all years.
Long-Run Value to Book	Authors' calculation	Based on Rhodes-Kropf, Robinson, and Viswanathan (2005), Long-run value to book = Fundamental value based on long-run industry pricing rule - Book value
Edmans et. al's Discount	Authors' calculation	Based on Edmans, Goldstein, and Jiang (2012), Potential Value is the fitted firm market value from the quantile regression: Market Value = $\beta_0 + \beta_1$ (Book Value) + β_2 (Operating Cash Flow) + β_3 (Net Leverage) + e. We choose (1-α) equal to 0.20. The discount is defined as (Potential Value - Market Value)/Potential Value.

Appendix Table 1 continued from previous page

Variable name	Source	Variable definition
D. Macro and market timing variables		
Industry return	Ken French website	Annual return, R_t, on the FF49 industry portfolio in year t
3-year cumulative return	Authors' calculation	$(1 + R_t)(1 + R_{t-1})(1 + R_{t-2}) - 1$
Industry Wave	Authors' calculation	Based on Maksimovic, Phillips, and Yang (2012), we calculate the aggregate volume of mergers scaled by aggregate total assets of Compustat firms in each FF49 industry each year. Then, we calculate the mean and standard deviation of merger-to-total assets across all years. Industry Wave is defined as the z-score ((Aggregate Mergers-to-Total Assets in year t - Long-Run Mean)/Standard Deviation)
Credit Spread	Federal Reserve website	Moody's yield on AAA seasoned corporate bonds net of the 3-month treasury bill (secondary market rate)
Sentiment	Jeffrey Wurgler website	Sentiment index in Baker and Wurgler (2006) based on first principal component of six sentiment proxies where each of the proxies has first been orthogonalized to macroeconomic conditions
Mutual Fund Flow	Authors' calculation	Based on Edmans, Goldstein, and Jiang (2012), we compute mutual fund price pressure from Thomson Reuters mutual fund holdings database. Mutual fund price pressure is defined as the product of total flows experienced by each fund and shares of each stock as a proportion of fund's total assets.
Aggregate Merger Volume	SDC	Aggregate value of all merger transactions
Fraction All-Stock Mergers	SDC	Aggregate transaction value of all-stock mergers/Aggregate merger volume
E: Industry characteristics		
Vertical Relatedness	Joseph Fan website	Based on Fan and Lang (2000), the variable captures how much input/output of the acquirer's industry that is bought from and sold to the target firm's industry
Complementarity	Joseph Fan website	Based on Fan and Lang (2000), the variable captures how much acquirer industry and target industry share the same input/output.
High Tech Dummy	American Electronic Association	A dummy taking the value of 1 if the firm's 4-digit SIC is in the High-Tech industry
Top 20% Industry Leaders	Authors' calculation	A dummy variable indicating that the acquirer is in the top 20% of Total Assets among all Compustat firms in its FF49 industry
HHI	Authors' calculation	Herfindahl Hirschman Index calculated by total assets of Compustat firms for each FF49 Industry
Industry Fixed Effects	Ken French website	Industry dummies defined by the acquirer's FF49 industry
F: Geographic location		
Local Deal	Authors' calculation	A dummy taking the value of 1 if the acquirer and target are located within 30 miles from each other, The data on firm location are from the ZIP codes in SDC. The distance between acquirers and targets is computed using the spherical law of cosines formula: Distance = arccos(sin(lat1).sin(lat2)+cos(lat1).cos(lat2).cos(long2-long1)).R where R = Radius of the Earth = 3963 miles (lat1,long1)= coordinate (latitude,longtitude) of the acquirer in radians (lat2,long2)= coordinate of the target in radians, Coordinates (lat,long) of all the zip codes are from 1987 U.S. Census Gazetteer Files.
Urban Acquirer	Authors' calculation	A dummy taking the value of 1 if a firm is located within 30 miles from one of the ten largest metropolitan areas - New York City, Los Angeles, Chicago, Washington DC, San Francisco, Philadelphia, Boston, Detroit, Dallas, and Houston Coordinates of the city centers are from www.world-gazetteer.com.

Variable name	Source	Variable definition
G. Capital structure variables		
Net Leverage	Compustat	(Total Debts- Cash)/Total Assets
Book Leverage	Compustat	Total Debts/Total Assets
Market Leverage	Compustat	Total Debts/ (Market value of equity + Total debts), Market value of equity = Closing price x number of shares outstanding
Deviation from Target Leverage	Authors' calculation	Based on Harford, Klasa, and Walcott (2009), Deviation from target leverage is the fitted residuals from the following cross-sectional (year-by-year) regression: Leverage = β_0 + β_1 (Size) + β_2 (Operating Efficiency)+ β_3 (Market to Book Equity) + β_4 (R&D) + β_5 (Missing R&D Dummy) + Industry Fixed Effects + e. All explanatory variables are lagged by one year.
Cash Holding	Compustat	Cash/Total Assets
Excess Cash	Authors' calculation	Excess cash is the fitted residuals from the following cross-sectional (year-by-year) regression: Cash Holding = β_0 + β_1 (Size) + β_2 (Operating Efficiency)+ β_3 (Market to Book Equity) + β_4 (R&D) + β_5 (Missing R&D Dummy) + β_6 (Leverage) + Industry Fixed Effects + e. All explanatory variables are lagged by one year.
Large Deal Dummy	SDC	A dummy taking the value of 1 if the ratio of Deal value to Total assets is in the top quartile
Stock Issue Dummy	SDC	A dummy taking the value of 1 if the acquirer issues stock in the year of merger (t) or the prior year ($t-1$)
H. Bidder returns and risk factors		
Announcement Return	Authors' calculation	Abnormal returns are estimated from a standard market model: Ri = a + b Rm +e. We use CRSPs daily holding period returns (dividends included) for Ri. Following Betton, Eckbo, and Thorburn (2008), we use [-291: -42] as the estimation window, [-41; -2] as the exclusion period due to run-ups, and [-1; 1] as the event window. Event date is the announcement date on SDC.
Calendar Time Portfolio Return	Authors' calculation	Monthly returns on portfolios of acquirers, pure-stock acquirers, and pure-cash acquirers An acquirer will be in month t portfolio if it has announced the acquisition between month t-36 and t.
alpha	Authors' calculation	Jensen's alpha calculated from regressing Calendar Time Portfolio returns on Fama-French 3 factors and Fama-French 3 factors with Liquidity
Rm	CRSP	Excess return on the market = the value-weight return on all NYSE, AMEX, and NASDAQ stocks (from CRSP) minus the one-month Treasury bill rate
SMB	CRSP	SMB (Small Minus Big) is the return on the small portfolios minus the average return on big portfolios
HML	CRSP	HML(High Minus Low) is the return on the value portfolios minus the average return on growth portfolios
UMD	CRSP	Momentum (UMD) is the return on the up portfolios minus the average return on down portfolios
Liquidity	CRSP	Pastor and Stambaugh (2003)'s traded liquidity factor

Appendix Table 2
Annual distribution of merger bids classified by payment method

The table reports the number of mergers and the fraction of all-stock, all-cash and mixed bids by year. The SDC sample is 11,394 merger bids for U.S targets by U.S. public acquirers in the 1980 to 2008 period. The baseline sample is 4,919 mergers in the SDC sample that could be matched with CRSP and Compustat. All variables are defined in Appendix Table 1.

	All Deals		% All-stock bids		% All-cash bids		% Mixed offers	
Sample:	SDC	Baseline	SDC	Baseline	SDC	Baseline	SDC	Baseline
1980	27	16	37	44	19	25	44	31
1981	265	116	19	23	56	47	25	29
1982	415	146	9	10	72	75	19	14
1983	738	256	12	14	74	76	14	11
1984	783	252	13	16	67	67	20	17
1985	130	51	23	25	38	35	39	39
1986	157	70	17	20	45	46	38	34
1987	149	85	26	26	37	35	38	39
1988	156	95	17	19	49	47	34	34
1989	204	90	25	21	25	14	50	64
1990	222	108	30	32	14	15	55	53
1991	270	137	38	37	10	11	52	52
1992	273	133	37	38	8	11	55	52
1993	304	165	35	31	18	22	47	47
1994	378	226	40	34	19	17	41	50
1995	496	258	44	44	18	17	39	39
1996	505	306	47	48	13	13	40	39
1997	652	404	45	46	15	15	39	39
1998	778	417	40	43	17	16	44	41
1999	612	307	44	50	16	15	40	36
2000	671	310	48	46	12	16	40	38
2001	436	150	36	29	14	18	51	53
2002	293	93	34	29	16	27	50	44
2003	329	103	28	14	18	35	55	51
2004	372	112	22	12	19	38	59	50
2005	462	141	17	7	24	45	59	48
2006	489	141	13	11	21	39	66	50
2007	463	131	16	8	22	48	62	44
2008	365	100	12	4	21	35	66	61
Total	11,394	4,919	29%	31%	28%	29%	42%	40%

Appendix Table 3
Industry distribution of acquirers and all-stock bids

The table reports the total dollar volume of merger bids (in $ thousand) and the fraction of all-stock bids by the acquirer's FF49 industry. The sample is 4,919 merger bids for U.S targets by U.S. public acquirers in the 1980 to 2008 period. *% All-Stock Mergers* is the fraction of all mergers paid in stock by number (column (3)) and volume (column (4)). All variables are defined in Appendix Table 1. The rows are ordered by frequency based on *% All-Stock Mergers*.

	All Mergers		% All-Stock Mergers	
	Frequency	$ Volume	by number	by volume
	(1)	(2)	(3)	(4)
Coal	5	549	60	99
Computer Software	704	220,040	48	56
Computers	198	67,964	44	43
Precious Metals	21	4,163	43	68
Electronic Equipment	324	107,411	42	50
Construction	63	4,073	38	59
Business Services	296	36,793	38	40
Retail	288	117,839	36	16
Medical Equipment	153	29,188	35	47
Pharmaceutical Products	154	317,865	34	73
Agriculture	21	3,899	33	2
Defense	3	497	33	10
Other	218	65,615	32	15
Measuring and Control Equipment	144	26,377	31	22
Personal Services	91	8,091	30	39
Health care	135	19,321	28	12
Transportation	68	18,003	28	8
Entertainment	74	52,884	27	5
Machinery	161	25,730	27	43
Electrical Equipment	100	7,429	27	31
Fabricated Products	27	1,877	26	15
Petroleum and Natural Gas	247	255,058	26	23
Communication	204	583,758	25	32
Restaurants, Hotels, Motels	63	5,995	24	6
Wholesale	244	25,915	23	15
Rubber and Plastic Products	40	5,448	20	18
Consumer Goods	75	16,228	16	10
Apparel	56	7,358	16	14
Textiles	31	6,875	16	11
Steel Works Etc	91	33,005	16	4
Automobiles and Trucks	66	21,212	15	5
Food Products	99	42,909	14	3
Business Supplies	73	47,164	14	36
Chemicals	80	32,479	13	2
Construction Materials	100	7,819	13	34
Aircraft	39	34,377	13	40
Beer and Liquor	17	18,538	12	0
Recreation	37	7,559	8	0
Utilities	15	8,485	7	0
Shipping Containers	17	1,801	6	2
Printing and Publishing	57	12,686	4	0
Candy and Soda	4	1,041	0	0
Tobacco Products	1	19,275	0	0
Shipbuilding, Railroad Equipment	9	1,103	0	0
Non-Metallic and Industrial Metal Mining	6	11,998	0	0
Total	4,919	2,343,693	31	35

Appendix Table 4
Estimation of target leverage and target cash

This table summarizes the results from the estimation of target leverage and target cash. The dependent variable is market leverage (column (1)), book leverage (column (2)), and cash ratios (column (3)). Explanatory variables are firm characteristics lagged by one year. The coefficients are the time-series averages of the annual leverage and cash regressions. The sample is 4,919 merger bids by U.S. public acquirers for U.S. targets in the 1980 to 2008 period. All variables are defined in Appendix Table 1. N is the average number of observations in the annual regressions. Numbers in parentheses are the t-statistics from tests whether the time-series average is equal to zero. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level.

Dependent variable:	Market Leverage	Book Leverage	Cash
	(1)	(2)	(3)
Bidder Characteristics:			
Size	0.0077	-0.0015	-0.0117
	(12.71)***	(1.05)	(15.48)***
Operating Efficiency	0.0018	0.0003	-0.0002
	(4.14)***	(0.73)	(1.31)
Market to Book Equity	-0.0062	-0.0028	0.0009
	(19.65)***	(6.41)***	(7.7)***
R&D	-0.2129	0.0276	0.1976
	(10.39)***	(1.02)	(9.36)***
Missing R&D Dummy	0.0462	0.0413	-0.0045
	(16.04)***	(9.94)***	(2.84)***
Asset Tangibility	0.0782	0.1066	-0.0408
	(15.59)***	(18.20)***	(11.31)***
Leverage			-0.06
			(11.2)***
Industry Fixed Effects	Yes	Yes	Yes
N	4103	4142	4076

Appendix Table 5
Acquirer post-merger portfolio stock returns

The table reports the coefficient estimates from calendar time portfolio regressions. The dependent variable is the monthly return on portfolios of all acquirers (columns (1) and (4)), all-stock acquirers (columns (2) and (5)), and all-cash acquirers (columns (3) and (6)). An acquirer will be in month t portfolio if it has announced the acquisition between month t-36 and t. The explanatory variables are the Fama-French three factors (R_m, *SMB*, and *HML*) and momentum (*UMD*). Columns (4) to (6) adds the traded liquidity factor from Pastor and Stambaugh (2003). *Rm* is excess return on the market. *SMB* is the average return on small minus large stock portfolios. *HML* is the average return on value minus growth portfolios. *UMD* is the average return on up minus down portfolios. The monthly returns on acquirer portfolios are equal-weighted in Panel A and value-weighted in panel B. The sample is 4,919 merger bids by U.S. public acquirers for U.S. targets in the 1980 to 2008 period. All variables are defined in Appendix Table 1. t-statistics are in parentheses and standard errors are robust. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

Sample:	All	All-Stock	All-Cash	All	All-Stock	All-Cash
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Equal-weighted returns						
alpha	-0.062	-0.233	0.003	-0.126	-0.373	-0.015
	(0.55)	(1.07)	(0.03)	(1.10)	(1.86)*	(0.13)
Risk Factors:						
Rm	1.06	1.145	0.993	1.068	1.12	0.99
	(42.32)***	(23.65)***	(38.42)***	(42.18)***	(25.31)***	(37.85)***
SMB	0.811	0.938	0.576	0.823	0.944	0.58
	(20.89)***	(12.50)***	(14.39)***	(21.23)***	(13.94)***	(14.48)***
HML	-0.099	-0.292	0.072	-0.09	-0.316	0.069
	(2.52)**	(3.83)***	(1.76)*	(2.28)**	(4.55)***	(1.68)*
UMD	-0.239	-0.425	-0.172	-0.234	-0.432	-0.174
	(8.07)***	(7.41)***	(5.59)***	(7.88)***	(8.31)***	(5.65)***
Liquidity				0.077	0.110	0.039
				(2.64)***	(2.17)**	(1.31)
R^2	0.90	0.76	0.86	0.90	0.80	0.87
N	383	381	382	371	371	370
Panel B: Value-weighted returns						
alpha	0.036	-0.036	0.18	0.014	-0.13	0.186
	(0.47)	(0.28)	(1.57)	(0.19)	(1.01)	(1.58)
Risk Factors:						
Rm	1.001	1.002	0.96	1.02	1.027	0.973
	(57.51)***	(35.12)***	(37.58)***	(60.06)***	(36.06)***	(37.49)***
SMB	-0.082	-0.114	-0.112	-0.068	-0.087	-0.106
	(3.03)***	(2.58)**	(2.82)***	(2.63)***	(2.00)**	(2.67)***
HML	-0.226	-0.416	-0.217	-0.202	-0.386	-0.200
	(8.25)***	(9.27)***	(5.40)***	(7.60)***	(8.66)***	(4.92)***
UMD	-0.073	-0.145	-0.157	-0.058	-0.126	-0.146
	(3.55)***	(4.28)***	(5.16)***	(2.93)***	(3.77)***	(4.78)***
Liquidity				0.027	0.058	-0.007
				(1.37)	(1.78)*	(0.23)
R^2	0.92	0.82	0.83	0.93	0.83	0.83
N	383	381	382	371	371	370