

Do Institutions Prefer High Value Acquirers? An Analysis of Trading in Stock-Financed Acquisitions

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Abstract

Prior literature argues that stock-for-stock mergers are often financed by overvalued stock. How do a target's institutional owners trade when faced with a stock-financed bid, particularly one from an acquirer more likely to be overvalued? If institutional owners perceive the acquirer's stock as overvalued, theory suggests they should sell their holdings more aggressively and reap short-term profits before such overvaluation dissipates. Consistent with high rates of institutional share turnover, we find that slightly more than half of institutions liquidate their shares. However, share retention is significantly higher when valuation measures suggest a greater potential for acquirer overvaluation. This finding holds both for institutions whose portfolios imply a preference for growth stocks as well as those that prefer value stocks. Institutions with large-cap, growth-stock preferences are the most enthusiastic about bids from large high valuation acquirers, substantially increasing their stakes in such deals.

JEL classification: *G34*

Keywords: *Mergers and acquisitions, takeovers, institutional trading, overvaluation*

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Abstract

Prior literature argues that stock-for-stock mergers are often financed by overvalued stock. How do a target's institutional owners trade when faced with a stock-financed bid, particularly one from an acquirer more likely to be overvalued? If institutional owners perceive the acquirer's stock as overvalued, theory suggests they should sell their holdings more aggressively and reap short-term profits before such overvaluation dissipates. Consistent with high rates of institutional share turnover, we find that slightly more than half of institutions liquidate their shares. However, share retention is significantly higher when valuation measures suggest a greater potential for acquirer overvaluation. This finding holds both for institutions whose portfolios imply a preference for growth stock as well as those that prefer value stock. Institutions with large-cap, growth-stock preferences are the most enthusiastic about bids from large high valuation acquirers, substantially increasing their stakes in such deals.

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Introduction

How do a target's institutional shareholders respond to a stock-for-stock bid, particularly one from an acquirer with a high valuation? In this paper we examine the trading activity of institutional owners of target shares (but not acquirer shares) in completed stock-for-stock mergers. We find that 56% of the institutions we track either sell their target shares prior to deal completion or their converted acquirer shares soon thereafter. Liquidations are less likely, however, when acquirers have higher valuations. Moreover, non-liquidating institutions increase their stakes on average, and do so more strongly, in deals with higher acquirer valuations. Consistent with recent literature highlighting the role of style preferences, we also find that affinity for high-valuation acquirers is stronger for institutions that prefer growth stocks. These results may help explain why target firms might accept stock-financed deals despite findings in the literature that such deals do not typically create value.

Our research stems from the observation that merger waves are correlated with the stock market. Periods of heightened merger activity, especially for stock-financed transactions, tend to occur when the stock market is booming.¹ In addition, it often takes a contracting stock market to bring a merger wave to a halt. These facts lead to the view that misvaluation in the stock market or information asymmetries between managers and outsiders can influence the level of stock-financed acquisitions (for example, Shleifer and Vishny (2003), Dong, Hirshleifer, Richardson and Teoh (2006)). According to this view, managers of overvalued firms use their highly valued stock to finance the purchase of fairly priced or less overvalued targets. Buttressing this view is the finding that in terms of long-term wealth effects, stock-financed acquisitions do not appear to create value on average.²

Given this finding and the hypothesized role of large investors in the market for corporate control (Shleifer and Vishny (1986)), a natural question is how institutional owners of

¹ For example, see Maksimovic and Philips (2001) and Jovanovic and Rousseau (2008).

² Loughran and Vijh (1997) find that stock-financed acquisitions do not perform well in the post-acquisition period and that target shareholder returns from the pre-announcement period through deal completion are non-positive (negative for larger targets). See also Rau and Vermaelen (1998), Agrawal and Jaffe (2000), and Mitchell and Stafford (2000).

target firms evaluate stock-financed mergers. We find institutional owners are net sellers on average which, in itself, is not surprising given the normal trading behavior, profit taking and rebalancing needs of institutions (e.g., Baker, Coval and Stein (2007)). The more interesting question that we pursue is cross-sectional: does share retention vary across acquirer valuation metrics? We believe the answer has implications for the potential efficacy of institutional monitoring in corporate control events. If institutions do not appear to make appropriate trading decisions in mergers, it suggests that poor deals are less likely to be opposed either through activism or indirectly through trading.³

As is common in much of the literature, we measure price-to-book of equity and market-to-book of assets as our valuation metrics of the acquirer's stock. If institutional owners perceive that the acquirer's stock is overvalued according to such metrics, arguments in Shleifer and Vishny (2003) imply that aggressive selling may follow at some point. Institutions with relatively short horizons may temporarily support the merger if they believe they can liquidate their holdings before the overvaluation is corrected in the market.⁴ Such institutions will view the market's reaction to an overvalued stock-financed bid as being upward biased and will trade accordingly. The resulting prediction is that institutions will eventually sell more heavily after offers from acquirers they perceive to be more overvalued.

Another possibility is that institutional shareholders do not regard highly-valued acquirers as being overvalued and react to their bids as they would to bids from other acquirers. They may trade or retain their target shares according to their usual trading strategies, regardless of the acquirer's valuation. In this regard, the fact that the median shareholder does not retain shares during our measurement period is not particularly surprising. Baker et al. (2007) find that during the 12 quarters prior to a merger's announcement, 43% of institutions liquidate their shares of target firms over a given four-quarter period. Hence, once a merger is announced it is not surprising to observe an even higher degree of institutional selling due to profit taking and rebalancing needs. Indeed, Baker, et al. (2007) find

³For example, see Parrino, Sias and Starks (2003) for the potential monitoring role of institutional trading.

⁴Target managers may react similarly to short-term motives and may be further lured by lucrative severance payouts or offers of employment with the acquirer (see Shleifer and Vishny (2003) and Hartzell, Ofek and Yermack (2004)).

that only about 30% of institutional investors retain their positions through the merger's completion. Such trading patterns may be unrelated to measures of acquirer valuation.

A third possibility is that institutions actually prefer acquirers with high market values. They may, for example, view acquirers with high market valuations as being well run or having superior growth opportunities (Lakonishok, Shleifer and Vishny (1994) and Dong et al. (2006)). The resulting prediction is that institutions will retain more shares, or even buy additional shares, in deals involving high-valued acquirers.

To conduct our study, we examine ownership of acquirer shares at the second quarter-end after the deal's completion for deals announced during 1980-2006. As noted, our sample is limited to target-share owners that do not own acquirer shares prior to the deal announcement. This approach has two advantages. First, it narrows the focus to institutions that are less likely to have pre-existing motives for owning or retaining the acquirer's stock.⁵ Second, these institutions are particularly interesting to study due to their strong incentives to carefully evaluate the merger deal. After all, if they are passive and do not trade, their target shares will be converted into a new investment. In comparison, institutions that already hold both the acquirer and target shares could well have different motives to retain or sell their holdings given their revealed preference for holding acquirer shares.⁶ While the approach we adopt is appropriate given the question that we are seeking to address—whether the retention decision of target shareholders is influenced by acquirer valuation—a limitation is that we do not assess how the broader set of institutions may evaluate the acquisition.

Our empirical findings are more consistent with the third possibility we consider. Although the median institution liquidates its holdings, controlling for other factors that may affect institutional trading we find that institutions own 20% more than predicted (in ab-

⁵For example, a mutual fund that has a relatively negative assessment of the future stock returns of an acquirer may nonetheless retain acquirer shares if it has capital gains liabilities in the shares that it would be forced to pass along to its retail investors. Of course, regardless of whether a target shareholder already owns acquirer shares, capital gains on the target shares it owns may influence its decision of whether to liquidate the holdings or to have them convert into acquirer shares and thereby defer the tax liability. We address this potential tax issue by showing that our results are unaffected by the target's prior returns.

⁶Cross-holdings by institutions could potentially influence the merger process itself, though Harford, Jenter and Li (2011) find that such holdings are too small to matter in most acquisitions.

solute terms) when the acquirer’s price-to-book ratio is in the top sample quartile (we find similar results in univariate analysis). These findings are robust to a variety of regression specifications and the use of market-to-book value of assets as an alternative valuation measure. Additionally, we use the decomposition approach in Rhodes-Kropf, Robinson and Vishwanathan (2005) (henceforth RKRv) to provide another market overvaluation measure and again our findings hold.

We also find that institutional style preferences seem to affect the trading behavior of institutions in our sample. Mutual funds are well known to follow style preferences (Chan, Chen, and Lakonishok (2002)), and Abarbanell, Bushee, and Raedy (2003) find that institutional style preferences affect investment decisions in spinoffs. Because stock-financed bids from overvalued acquirers are more likely to come from firms whose stocks are classified as growth stocks (RKRv; Dong, Hirshleifer, Richardson, and Teoh (2006)), institutions with preferences for such stocks may trade very differently than those preferring value stocks. To investigate, we categorize institutions based on their holding preferences as in Abarbanell, Bushee and Raedy (2003). We find that share retention is increasing in the acquirer’s price-to-book ratio regardless of whether the institution tends to prefer growth or value stocks,⁷ although the result is strongest for growth oriented institutions. Perhaps it is due, in part, to such a preference that institutions do not appear on average to trade in a manner that would indicate concern about potential acquirer overvaluation. Coupled with target management’s incentives often being skewed by the acceleration of stock option exercise, severance pay, or employment deals (Hartzell, Ofek and Yermack (2004) and Shleifer and Vishny (2003)), these results may help explain why target firms accept stock-financed deals that, on average, appear to have poorer long-term performance than cash deals.

⁷This result is consistent with Chan, Chen and Lakonishok (2002) who find that when mutual funds choose to stray from a benchmark, they are more prone to favor growth stocks.

1 Related Literature

The findings in our study relate to several strands of literature concerned with mergers and acquisitions, specifically stock-financed acquisitions, as well as the role of institutional investors. Our paper follows those such as Shleifer and Vishny (2003), RKRV and Dong et al. (2006) that explore the use of overvalued stock to finance acquisitions. Dong et al. (2006) find that such misvaluation helps explain takeover activity during the 1990-2000 period (a period of strong stock-market performance), while RKRV use a market-to-book decomposition to find similar support over the 1978-2001 period.

In studying post-offer stock returns, Loughran and Vijh (1997) find that stock-based acquisitions are associated with significantly negative acquirer excess returns, while cash-based offers are associated with significantly positive excess returns. Similar findings are reported in Rau and Vermaelen (1998) (using size and book-to-market benchmarks) and Agrawal and Jaffe (2000). Mitchell and Stafford (2000) argue that although many studies of long-term returns following corporate events are flawed on methodological grounds, there is nonetheless evidence of long-run acquirer underperformance in stock mergers.

Our work is also related to papers that discuss the incentives of large shareholders to engage in monitoring or control activities (e.g., Shleifer and Vishny (1986), Admati, Pfleiderer and Zechner (1994) and Maug (1998)).⁸ Two recent papers that examine the monitoring role of institutions in the merger process in particular are Gaspar, Massa and Matos (2005) and Chen, Harford and Li (2007). Gaspar, et al. (2005) find that bid premiums are lower when the target firm's institutional owners have demonstrated shorter-term investment strategies in the past. They argue that shorter-term institutional investors provide weaker monitoring and hence allow target managers to accept poorer deals. Chen, et al. (2007) report complementary findings in which the presence of long-term institutions with large shareholdings in the acquirer firm is associated with higher post-merger returns and a greater likelihood that deals with poor announcement returns are withdrawn.

⁸Other papers on the monitoring role played by large shareholders include Bethel, Liebeskind and Opler (1998), Bertrand and Mullainathan (2001) and Parrino, Sias and Starks (2003).

In contrast to studies which focus on the direct governance role institutions play in the merger process, however, our focus is on trading decisions and in this respect is closer to Ashraf and Jayaraman (2007). They find that active institutions (investment companies and independent investment advisors) increase their holdings of acquirer stock when the acquirer's announcement return is more positive. Institutions also respond more favorably, in terms of their trading around the announcement, to stock acquisitions than to cash acquisitions despite the former creating less wealth as measured by announcement returns. Our work differs from Ashraf and Jayaraman (2007) in that our main focus is on how pre-announcement acquirer valuation metrics affect institutional trading for stock deals, and only for institutions that own target stock but not acquirer stock (as of the deal's announcement). By examining such a sample, we build on a substantial prior literature regarding how the market valuation of the acquirer may affect the merger process. This sample also puts the focus on the investment decisions of institutions who, if completely passive, will have a new investment thrust upon them when the target stock they own is converted into acquirer shares.

In many contexts, institutions are often regarded as being more sophisticated and informed than individual investors. Bowen, Davis and Matsumoto (2002) and Ke and Petroni (2004) suggest that, at least prior to Regulation FD, one source of the advantage institutions have may have been private communications with management. Bartov, Radhakrishnan and Krinsky (2000) and Ke and Ramalingegowda (2005) provide evidence that institutions trade to exploit the well known post-earnings announcement drift.

However, there are also papers that suggest many institutions do not appear particularly sophisticated in their investment strategies. Griffin, Harris and Topaloglu (2003) show that many institutional investors chase momentum returns but do not earn significant future abnormal returns from doing so. It is also well documented that investment strategies are sometimes distorted due to window dressing concerns (e.g., Musto (1999)). Furthermore, some authors find that institutions tend to herd in their investment decisions (Lakonishok, Shleifer and Vishny (1992) and Grinblatt, Titman and Wermers (1995)).

Finally, our study contributes to an emerging body of work on institutional style preferences. Abarbanell, Bushee and Raedy (2003) find that institutional demand for stocks after spin-offs is affected by their general investment strategies. Bushee and Goodman (2007) study informed trading by institutions and argue that due to a specialization effect, institutions are more likely to possess private information on stocks that conform to their style preferences. Preferences for growth versus value among mutual funds (Chan, Chen, and Lakonishok (2002)) may be due to such specializations. Jiang (2010) finds a general preference for high market-to-book stocks among institutions.⁹

2 Data and Descriptive Statistics

2.1 Data

We obtain our sample of completed takeovers between 1980 and 2006 from Thomson Financial’s SDC Platinum database (SDC).¹⁰ Using data available in SDC, we restrict the sample to stock-for-stock merger deals involving publicly traded acquirer and target firms. We further require that the acquirer not own more than 30% of the target before the merger, and that the acquirer owns 100% afterwards. Deals in which the acquirer or target is in the financial services industry are excluded. These screens result in 3,170 candidate merger deals.

We next limit the sample to mergers for which we can match the acquirer and target to the Center for Research in Security Prices (CRSP) and Standard and Poor’s COMPUSTAT databases, which results in a sample of 1,447 mergers. An additional 155 deals are excluded because we do not find the necessary institutional ownership data for both acquirer and target firms in the CDA/Spectrum 13F database. Hence, we begin with 1,292 candidate deals before screening out cases that do not have at least one target institutional owner meeting our institutional ownership requirements, as detailed below.

⁹See Kumar (2009) for similar preferences by retail investors.

¹⁰We focus on completed deals so we can measure the shares an institution owns at the second quarter-end available following the merger and hence reduce the impact of potential short-term trading frictions. As we discuss later, evidence from shorter-term changes in holdings from before the merger announcement to the latest quarter-end prior to deal completion suggests short-term trading frictions may inhibit the ability of institutions to rebalance their positions quickly.

To ensure that the institutions we examine hold a nontrivial stake in the target, we require they own one percent or more of target shares at the end of the latest quarter before deal announcement.¹¹ Next, to sharpen the focus on institutions that are less likely to have a motive to own the acquirer’s stock, we eliminate institutions that already own the acquirer’s stock prior to the deal’s announcement. Note that this screen also leaves us with cases in which an institution is more likely to carefully consider the consequences of retaining target shares through the merger’s effective date, because retaining shares will result in the institution owning stock of a firm in which it has no prior ownership. Of the 1,292 candidate merger deals, we eliminate 147 because there is not at least one institutional owner in the target that both meets the one percent pre-announcement target ownership threshold and the requirement that it owns no shares in the acquirer prior to announcement. As with prior studies, we impose a size filter and hence additionally eliminate 140 deals in which the target stock has an equity capitalization less than \$30m prior to the announcement. Our final sample consists of 4,802 institution-merger observations, which encompass a total of 1,005 mergers and 1,039 distinct institutions. The median merger in our sample has two institutional owners.

2.2 Descriptive Statistics

In Panel A of Table I we report descriptive statistics for the merger deals in our sample. Not surprisingly, acquirers are larger than targets. *Relative Acquirer Size*, which is the acquirer’s market value of equity divided by that of the target measured 20 trading days prior to the merger announcement, has a mean and median of 29 and 5, respectively. The mergers in our sample take a mean and median of 134 and 112 calendar days, respectively, to complete. Fifty-six percent of the mergers are non-diversifying, which we define as having the acquirer and target in the same primary three-digit SIC industry. Definitions for this and other variables in the study are provided in the Appendix.

¹¹ As we discuss later, the main results in this study are robust to measuring pre-announcement institutional ownership as of the latest quarter-end that occurs at least one full quarter prior to the merger announcement, or imposing an additional restriction that the institution’s target-share ownership is at least one percent of its portfolio.

Panel B describes the acquirers and targets. Our primary valuation measure is the firm's P/B , which is the market value of equity divided by the book value of equity. As noted in Dong et al. (2006), this measure has an advantage over using long-run returns to infer overvaluation, given the controversies about how to interpret and measure the statistical significance of long-run returns. They note that for P/B to be useful, it need only contain information about misvaluation above and beyond that contained in the market value alone. In constructing P/B we measure book values at the latest fiscal year-end prior to the merger announcement date, and market values are measured 20 trading days prior to the announcement. P/B (as well as the market-to-book of assets ratio, which we use as an alternative) is winsorized at the top and bottom 1%. When a firm has negative book value, we assign the maximum value of P/B in the sample (after winsorizing). There are 24 such cases, and our results are robust to removing them from the sample.

The mean and median P/B of acquirer firms in our sample are 8.9 and 3.9, respectively. This compares to an average of 6.0 for acquirers in stock merger deals and 3.7 in mixed merger deals (cash and stock) in Dong, et al. (2006). Note that the mean and median P/B for target firms is 5.8 and 2.8, respectively, and that the mean and median of *Acquirer P/B - Target P/B* are 3.1 and 0.9, respectively. We find similar relative results using the ratio of the market value of assets to book value of assets (MA/BA). Shleifer and Vishny (2003) predict that in acquisitions driven by overvaluation, acquirers will have higher valuations than targets. Hence, the relative valuations of acquirers and targets (as measured by P/B and MA/BA) in our sample seem consistent with their description of overvaluation-driven takeovers.

We also report $ACAR(-1,+1)$ and $TCAR(-1,+1)$, which are the cumulative abnormal returns for the acquirer and target firms, respectively, over the three trading days around the merger announcement. Consistent with the literature, average announcement effects are negative for acquirers and positive for targets. For completeness we also report statistics on firm size (using market value of equity) and leverage. The sizes of acquirers and targets are consistent with Panel A in that acquirers have a larger mean and median. Leverage ratios of acquirers and targets are similar.

Panel C provides detail on the sample distribution through time and across 48 Fama-French industries. There is a noticeable spike in the number of deals during the 1995-2001 period, coinciding with a strong bull market period. In addition, over 50% of the sample is concentrated in six industry groups: 13 (pharmaceutical products), 30 (petroleum and natural gas), 32 (communication), 34 (business services), 35 (computers), and 36 (electronic equipment). These findings lead us to control for year and industry effects in the analysis.

3 Valuation Measures and Institutional Trading

3.1 Univariate Results

In Table II we report univariate statistics for the institutions we track in the sample. We first report statistics for the full sample of 4,802 institution-merger observations, and then by quartiles based on *Acquirer P/B*.

Panel A reports results for the full sample for completeness, but we focus our discussion on the quartile groups. The median *Institution Size*, based on market value of holdings across all stocks reported in the 13F data at the quarter-end prior to merger announcement, ranges from a low of \$3.6bn in the third *P/B* quartile group to \$4.9bn in the top *P/B* quartile. *Pre-Announcement Holdings* are the percent of target shares owned by the institutions in our sample at the latest quarter-end prior to the merger announcement. The mean and median are 3% and 2%, respectively, across all quartile groups.

We now turn to our main variable of interest, which is *Post-Merger Retention Rate*. This variable is the number of acquirer shares the institution owns after the merger’s effective date (measured at the second quarter-end after the effective date) divided by the expected number of shares, where the latter is based on the institution’s ownership of target shares prior to the announcement (measured at the latest quarter-end prior).

To illustrate, suppose an institution’s pre-announcement ownership of target shares would, via the exchange ratio provided in the merger, be expected to convert into 30,000 acquirer shares of the post-merger acquirer firm. If we observe the institution actually owns

15,000 acquirer shares at the second quarter-end following the effective date, the *Post-Merger Retention Rate* would be calculated as $(15,000 / 30,000) = 50\%$. This metric will capture both changes in holdings due to trading in the target shares (prior to the effective date), and changes in holdings due to trades in acquirer shares that take place before we measure post-merger holdings in the quarterly data. We winsorize this variable at the top one percent level.

The median *Post-Merger Retention Rate* is 0% across all quartile groups; thus at least half of the institutions own no shares in the acquirer firm at the second quarter-end after the merger.¹² The mean, however, is 55% and is a result of non-liquidating institutions, on average, increasing their holdings (the mean retention rate for non-liquidating institutions is 123%). Panels B through D show that institutions retain substantially fewer shares when the acquirer is in the bottom *P/B* quartile group compared to the top quartile group. In the bottom quartile group, the mean *Post-Merger Retention Rate* is 52%, compared to a mean of 67% in the top quartile group. We do not test for statistical significance for this or other results in Table II, because we are more interested in drawing inferences after controlling for other factors through regression analysis. The univariate statistics do, however, suggest that institutional trading varies in the acquirer’s valuation, at least as measured by *P/B*.

For completeness we also examine *Pre-Merger Retention Rate*. This variable is the number target shares owned at the latest quarter-end prior to the merger’s effective date divided by the number of target shares owned at the latest quarter-end prior to the deal’s announcement. Constructing *Pre-Merger Retention Rate* allows us to examine selling activity already underway before the merger is completed. As an example of how this metric is calculated, if an institution holds 30,000 shares of the target before the announcement and 15,000 prior to the effective date, *Pre-Merger Retention Rate* is 50%. As for *Post-Merger Retention Rate*, we winsorize this variable at the top one percent level.¹³ The results in Panels B through D show that more shares are retained in mergers with high acquirer *P/B*

¹²We do confirm that these institutions are still carried in the 13F data with nonzero holdings in other stocks. The high average liquidation rate is consistent with the results in Baker, Coval and Stein (2007) who find that liquidations of target shares are common even well before a merger is announced.

¹³Note that if a calendar quarter-end does not occur between the merger’s announcement and effective dates, *Pre-Merger Retention Rate* cannot be calculated and hence the observation is not included in analysis using this variable.

than in mergers with low acquirer P/B . For example, the mean and median *Pre-Merger Retention Rate* in the bottom acquirer P/B quartile group are 51% and 40%, respectively, versus 58% and 66%, respectively, in the top quartile group.

In untabulated results we repeat the univariate analysis for MA/BA and find similar results—institutions retain more shares in deals with higher acquirer MA/BA ratios. We now turn to regression analysis so we can control for other factors that potentially affect institutional trading in target firms.

3.2 Regressions Explaining Post-Merger Retention Rate

Table III reports ordinary least squares regressions that explain *Post-Merger Retention Rate*.¹⁴ The key variable in models (1)-(3) is $\text{Log}(\text{Acquirer } P/B)$, the natural log of the acquirer’s P/B , and the key variable in models (4)-(6) is *Acquirer P/B TopQ*, an indicator variable set to one if the acquirer’s P/B is in the top sample quartile. All models include an indicator variable for each year as well as an indicator variable for each of the 48 Fama-French industries (we do not report the coefficients in the table). We also adjust p-values for clustering by merger (we discuss other types of adjustments in a subsequent section).

Model (1) shows that the acquirer’s P/B ratio is positively and significantly related to *Post-Merger Retention Rate*, as the coefficient and p-value for $\text{Log}(\text{Acquirer } P/B)$ are 0.085 and 0.001, respectively. This confirms the univariate result that institutions retain more shares in deals with higher acquirer valuations. In terms of economic significance, model (1) implies that holding other factors in the regression model constant, a one standard deviation increase in $\text{Log}(\text{Acquirer } P/B)$ results in *Post-Merger Retention Rate* increasing by 9% (in absolute terms). Given that the mean *Post-Merger Retention Rate* is 55% (see Table II), this is an economically material effect.

By including the log of target’s P/B in the regression we control for the possibility that an institution’s view of the acquirer’s P/B may be affected by whether the target is a high

¹⁴ Later in the paper we report and discuss similar results using a probit approach and we also discuss untabulated results using a tobit approach. We try these approaches for robustness because the left-hand side variable in Table III is truncated from below at 0%.

or low P/B firm. That is, if the institution already owns stock in a high or low P/B firm, this may indicate its preferences for high or low P/B stocks more generally. We do not find that $\text{Log}(\text{Target } P/B)$ is significant. Later, however, we examine style preferences more directly and find that preferences do affect retention rates.

The regression includes other variables as well: the institution's scaled size (the market value of pre-announcement holdings in all of the stocks it owns divided by the total market capitalization of NYSE, AMEX, and NASDAQ securities on CRSP to normalize across years), *Percent of Portfolio* (the percent of the institution's pre-announcement portfolio devoted to the target's stock), the acquirer's absolute size, the acquirer's size relative to the target, the acquirer's leverage ratio, and *Non-Diversifying* (an indicator variable set to one if the acquirer and target share the same three-digit SIC code). We observe that larger institutions retain more shares, potentially because it is more difficult for them to find replacement holdings or unwind their larger (on average) holdings. Institutions with a larger portion of their pre-announcement portfolio devoted to the target also retain more shares (the coefficient on *Percent of Portfolio* is positive and significant).

By including $\text{Log}(\text{Acquirer Size})$, we control for potential institutional preferences based on market capitalization. We find that institutions retain fewer shares in deals with larger acquirers. However, the size of the acquirer relative to that of the target does not significantly affect institutional trading, nor does the acquirer's leverage or whether the target and acquirer are in the same industry. For our purposes, the important point is that the P/B result holds after controlling for these various factors.

Model (2) adds $ACAR (-1,+1)$ and $TCAR (-1,+1)$, because an institution's trading decisions may be affected by the return it receives in the target shares around the announcement as well as any reactions in the acquirer's stock price. $ACAR (-1,+1)$ is positive and significant (p-value = 0.012). Hence, if the market responds more favorably (or less unfavorably) to the deal from the acquirer's perspective, institutions retain more shares. $TCAR (-1,+1)$ is not significant.

In model (3) we include additional control variables. *Change in Acquirer P/B* is defined as *Acquirer P/B* (recall this is measured just prior to announcement) minus the acquirer’s *P/B* measured one year before. We include this variable to control for the potential that institutional trading is affected by how the acquirer’s valuation measure has changed during the year leading up to the merger announcement, but it is not significant. We include *Days to Completion* as an ex-post control (albeit a noisy one) for how long the merger may have been expected to take or the likelihood of completion due to regulatory hurdles, logistical and personnel complications, etc. This variable is insignificant.

Finally, we include *Average Inst Trading* to control for background trends in institutional trading in the target firm. This metric uses eight quarters of institutional ownership data prior to the deal announcement and tracks how institutions that own at least 1% of the target in one quarter change their holdings to the next (see the Appendix for more detail). The metric is then scaled by how long the merger takes to complete, to roughly estimate how the average institutional owner with a significant stake in the target would be expected to change its holdings in the target firm based on prior institutional trading trends. The more positive (negative) the metric, the more institutions with significant stakes have been buying (selling) the target firm over a two-year period prior to deal announcement. This variable is also insignificant. Our key variable of interest, $\text{Log}(\text{Acquirer } P/B)$, remains significant and the magnitude of its coefficient implies that a one standard deviation increase in $\text{Log}(\text{Acquirer } P/B)$ results in *Post-Merger Retention Rate* increasing by 13% (in absolute terms).

In Models (4)-(6) we continue to find qualitatively similar results using a dichotomous *P/B* variable. We set *Acquirer P/B TopQ* to one if the *Acquirer P/B* is in the top quartile of the sample, and to zero otherwise. We observe that the coefficients on *Acquirer P/B TopQ* are positive and significant with values ranging from 0.199 to 0.222 and p-values ranging from 0.001 to 0.004. This implies that, on average, when the acquirer’s price-to-book is in the top quartile institutions retain around an additional 20%.

Models (7) and (8) repeat model (3) except they address the possibility that retention rates are affected by the potential endogeneity of the method of payment decision. In

model (7) we include the target’s stock return over the calendar year prior to the merger’s announcement. Presumably, when target returns are higher the preference for stock is greater by any owners of target shares who have capital gains tax concerns (e.g., mutual funds that have to pass net gains to their retail clients). We find that the target’s prior-year return is insignificant. Model (8) takes a two-stage least-squares approach in which the first stage estimates the likelihood of payment in stock (see the table description for more detail). Heckman’s Lambda is insignificant, which suggests that there is not a significant selection bias. It is worth noting that the coefficients and p-values for the acquirer’s price-to-book ratio are not materially affected compared to those observed in model (3).

In untabulated results we include additional control variables, one at a time. It is possible that some institutions choose to retain shares of the target stock to pursue merger arbitrage opportunities. These opportunities may arise when the target’s post-announcement stock price does not initially rise to the expected terminal value due to the possibility the deal will not be completed.^{15,16} Pursuing such opportunities may cause institutions to retain more target shares and may, all else equal, also result in greater retainment of acquirer shares. Therefore, we add the return of the target from after the announcement through the delisting date. We can view this variable as an ex-post estimate of the holding-period return in the target stock an institution may have expected to earn after the deal was announced. The target return variable is not significant and the acquirer P/B variable’s magnitude and significance are unaffected.¹⁷

We also try other control variables. First, we include an indicator variable set to one if the deal is hostile according to SDC (1% are thus classified), and this variable is not significant. Next, we include an indicator variable set to one if the acquirer has granted

¹⁵For example, in a cash tender offer a typical pattern (particularly if bidder competition is not expected) is for the post-announcement target stock to trade at a discount to the tender price due to uncertainty over whether the tender offer will be completed. The stock price then moves toward (or away from) the tender price as uncertainty over deal completion is resolved. Hence, the simple (risky) arbitrage strategy is to long the target stock and hope the offer is completed. In stock-for-stock deals, a common strategy is to long the target’s stock and short the acquirer’s stock. See Mitchell and Pulvino (2001), Baker and Savasoglu (2002) and Jindra and Walkling (2004) for papers that discuss and examine merger arbitrage strategies.

¹⁶It is possible that some institutions have the ability to hedge via trading derivatives or shorting acquirer shares. Although we do not have data to examine this issue, there is no reason to expect this to introduce a bias in the direction of higher retention rates in deals with higher acquirer valuation ratios.

¹⁷We try a number of return calculations that all yield similar results: CARs, excess holding period returns, raw holding period returns, and all of these adjusted so that they are on a per-day basis.

the target a lockup option. This variable provides an opportunity to investigate whether institutional trading is affected by the likelihood the deal will be completed (Burch (2001) finds deals with lockup options have significantly higher completion rates). Along similar lines, we also investigate whether institutional trading is affected by the size of the acquirer’s toehold in the target (observations with no acquirer toehold are coded with a 0% toehold). Neither the lockup option variable nor the toehold variable is statistically significant.¹⁸

3.3 Regressions Explaining Pre-Merger Retention Rate

Do institutions that do not plan to retain the acquirer shares they will receive actually sell their target shares prior to the effective date? On the one hand, some institutions may believe their returns will be higher if they sell target shares soon after the merger’s announcement is made, for example, because they believe the acquirer’s stock performance will be poor once the deal is completed. On the other hand, there are also potential reasons to wait and sell acquirer shares after the merger is completed. For example, we have already discussed merger arbitrage strategies in which a trader attempts to profit from the movement in the target firm’s stock between the merger’s announcement and completion.

In Table IV we estimate OLS regressions to explain *Pre-Merger Retention Rate*. We report the same eight specifications estimated in Table III, and the results for our key variable of interest are similar, although somewhat weaker in terms of economic magnitude. As we will discuss later below, this is perhaps not surprising.

In models (1)-(3) we find that $\text{Log}(\text{Acquirer } P/B)$ has a coefficient of between 0.031 and 0.041, with p-values ranging from 0.002 to 0.003. The coefficients imply that for a one-standard deviation increase in $\text{Log}(\text{Acquirer } P/B)$, *Pre-Merger Retention Rate* increases anywhere from 4% to 5%. This is economically significant given the overall mean pre-effective change in holdings is 53%, although the magnitude of the effect is not as large as we find for *Post-Merger Retention Rate* in Table III. In Models (4)-(6) the coefficient on

¹⁸ We try a number of specifications, including having both together or one at a time, adding a square term, using multiple indicator variables for various size ranges, and also adding interaction terms between the *Acquirer P/B* variable and the lockup or toehold. None of these specifications result in significant coefficients on any of these variables or an impact on our main result.

Acquirer P/B TopQ ranges from 0.054 to 0.058, with p-values ranging from 0.026 to 0.053. The magnitudes suggest that share retention is 5% to 6% greater when the acquirer’s *P/B* is in the top quartile.

As in Table III which examines *Post-Merger Retention Rate*, in Table IV we observe that institutions retain more shares when their size (in terms of market capitalization across all stocks they own) is larger. The coefficients on *Percent of Portfolio* and *Log(Acquirer Size)* are also significant, with the same signs as in Table III. Interestingly, we find that *ACAR(-1,+1)* is no longer significant. There is also weak evidence that selling before the effective date is affected by the target’s announcement return, with less selling (more retention) when target returns are lower. It may be the case that lower target announcement returns partially reflect lower perceived probabilities of deal completion and that institutions are less likely to trade in such deals.

Note that *Days to Completion* is negative and significant. One way to interpret this variable is as an ex post measure that, on average, should be positively related to the ex ante probability of deal completion. Under this interpretation, the negative coefficient would suggest that institutional selling is weaker when a deal is perceived as less likely to be completed. However, in untabulated results we include a lockup option which prior literature suggests is informative in terms of deal completion expectations. When we do so, the coefficients and significance levels on *Days to Completion* in Models (3) and (6) are unaffected (they do not become weaker). This result suggests that the significance of *Days to Completion* more likely indicates that it is difficult (or costly) for selling institutions to unload a large position quickly when there is less time to do so.¹⁹

More broadly, this finding suggests a likely explanation for why the relation between institutional trading and the acquirer’s *P/B* is weaker in Table IV (where the institutional trading metric is *Pre-Merger Retention Rate*) than in Table III (where *Post-Merger Retention Rate* is used). Compared to *Pre-Merger Retention Rate*, the alternative metric

¹⁹ Recall that *Pre-Merger Retention Rate* is measured at the latest quarter-end prior to the deal’s effective date, which implies that *Days to Completion* is not a very precise measure of the time institutions have to sell shares prior to when we measure their holdings. In untabulated results we substitute the number of trading days between the announcement date and when the pre-effective date quarterly holdings are measured. This variable has similar size and significance as *Days to Completion*.

Post-Merger Retention Rate allows for substantially more time for institutions to trade shares if they wish to do so. The fact that *Days to Completion* is significant in Table IV but not in Table III suggests that *Pre-Merger Retention Rate* is affected by a binding time constraint, whereas *Post-Merger Retention Rate* is not (relatively speaking).

Models (7) and (8) repeat those in Table III that address the potential endogeneity of the method of payment. Once again the key results continue to hold, and neither the target’s prior-year return nor Heckman’s Lambda are statistically significant.

In untabulated results we also try all of the additional control variables considered and discussed in the earlier regression analysis of *Post-Merger Retention Rate* (acquirer toehold, target returns between the announcement and effective date, etc.). The results are qualitatively unaffected.

3.4 Robustness

In Table V we address additional robustness concerns. First, the dependent variables in Tables III and IV are truncated at 0%, since as recorded in the 13F data, institutions can at most sell all of their shares (the data do not contain potential short positions). To make sure the OLS results are not materially affected by this truncation, in Panel A of Table V we report probit regressions in which the dependent variable is an indicator set to one if the retention rate is above the sample median. Models (1) and (2) use an indicator for whether *Post-Merger Retention Rate* is above its sample median of 0% (i.e., the indicator is set to one if the institution owns any shares of the post-merger acquirer), while models (3) and (4) take a similar approach for *Pre-Merger Retention Rate* (for this variable, the sample median of 52% is used). All models include the additional variables in models (3) and (6) of Table III (including industry and year dummies), but we do not report them here for brevity.

The panel reports the marginal effects (the change in the probability of being above the median per unit of change in the independent variable) above the bracketed p-values. As in Table III, p-values are adjusted for clustering by merger. The coefficient on *Log(Acquirer*

P/B) in model (1) is positive and significant (p-value < 0.001), consistent with the Table III results. The coefficient on *Acquirer P/B TopQ* in model (2) is also positive and statistically significant, which indicates that if the acquirer’s P/B is in the top quartile institutions are around 8% more likely to own acquirer shares after the merger (controlling for other factors). Models (3) and (4), in which the dependent variable is an indicator set to one if *Pre-Merger Retention Rate* is above the sample median of 52%, confirm the results from Table IV. The acquirer’s price-to-book ratio is positively associated with retention of target shares prior to the merger’s effective date. As before, we also find the association is not as strong as when using *Post-Merger Retention Rate*. In Panel B we report median regressions (models (1) and (2)) and inter-quartile regressions (models (3) and (4)) and continue to find that retention rates are higher in deals with higher acquirer price-to-book ratios. Overall, Panels A and B increase our confidence that the results in our study are not due to outliers.

In Panel C we include further restrictions on the sample. First, we wish to know whether our main result is driven only by lower liquidation rates when acquirer’s have higher price-to-book ratios. In models (1) and (2), therefore, we restrict the sample to institutions with non-zero post-merger liquidation rates. We find that even for non-liquidating institutions, retention rates are higher when acquirer price-to-book ratios are higher. In model (3) and (4) we impose an additional restriction that an institution’s pre-merger-announcement holding in the target is at least one percent of its portfolio. This dramatically reduces the sample size, but nonetheless we continue to observe that the main result holds.

In our main analysis we have measured the acquirer’s price-to-book ratio in absolute terms, rather than relative to the target’s price-to-book ratio. Our choice has the advantage of assuming an institution will evaluate the acquirer’s stock on its own merits, and not view the acquirer as having a low or high valuation based on how it compares to only one small part of the institution’s portfolio (the target’s stock). It is interesting, however, to investigate whether retention rates vary in the acquirer’s price-to-book ratio relative to the target’s. Panel D reports the results of four regressions that take various approaches.

In model (1) we replace the log of the acquirer’s price-to-book ratio with $\text{Log}(\text{Relative } P/B)$, which is the log of the ratio of the acquirer’s price-to-book ratio to that of the target’s.

We find that the relative price-to-book has a positive and significant coefficient ($p=0.058$). From model (2) we see that the effect is stronger when the target’s price-to-book is above the sample median. Models (3) and (4) repeat the analysis using a dichotomous variable for relative price-to-book and the results continue to hold. The greater the acquirer’s price-to-book, whether measured in absolute terms (as in Tables III and IV) or measured in relative terms (as in Panel D of Table V), the greater the retention of shares by institutional holders.

There are also other robustness checks that we do not report in the table. First, although we believe that price-to-book value of equity is a more appropriate valuation measure than the market-to-book value of assets (MA/BA) for a study of stock-market-driven mergers, we repeat our analysis with the latter and find qualitatively similar results. Second, because institutions may anticipate a merger announcement and adjust their holdings beforehand, we recalculate the two institutional trading metrics (*Post-Merger Retention Rate* and *Pre-Merger Retention Rate*) by measuring pre-announcement ownership one quarter earlier. Again, we obtain similar results. Third, we remove observations from the 1999-2000 period (during the tech bubble), and again results are robust.

Aside from the probit specification, there are also a number of other econometric tweaks we try. Although the p-values we report in the tables are adjusted for clustering by merger, we also find similar results if we cluster by institution instead, or if we use White’s correction for heteroskedasticity. Finally, as we have noted before, our continuous institutional trading measures (*Post-Merger Retention Rate* and *Pre-Merger Retention Rate*) are truncated from below. As an alternative to the probit approaches taken in Table V, we also try tobit regressions and find similar results.

4 Further Analysis

4.1 Long-Run Performance

The work in RKR, among others, emphasizes that valuation measures such as the market-to-book ratio (and, by implication, the price-to-book ratio) may potentially reflect both

misvaluation and growth opportunities. In Panel A of Table VI we use the market-to-book decomposition in RKRV to investigate how institutional trading varies in acquirer *RKRV Overvaluation*. We define *RKRV Overvaluation* as the sum of the firm specific error and time series sector error in RKRV. We also include the acquirer’s *RKRV Long-Run Value-to-Book*, which is the measure of growth opportunities from RKRV. Models (1) and (2) report ordinary least squares regressions that explain *Post-* and *Pre-Merger Retention Rate*, respectively, and models (3) and (4) report probit regressions using an indicator variable approach for whether the retention rates are above their respective sample medians.

The regressions in Panel A show that retention rates are increasing in both the acquirer’s *RKRV Overvaluation* and its *RKRV Long-Run Value-to-Book*. The key implication of this result, from our perspective, is that the earlier finding in which institutional retention rates are greater for deals with greater acquirer valuation ratios does not appear to simply be driven by growth opportunities.

In Panel B we examine whether post-merger acquirer returns are lower for stocks with higher acquirer price-to-book ratios. The first row reports median excess returns, measured as the acquirer’s one-year post-merger return minus the CRSP value-weighted return. The second row reports median four-factor alphas from a regression of monthly returns on the three Fama-French factors and the Carhart momentum factor. Median excess returns decrease monotonically across the four acquirer price-to-book quartiles and the medians in the highest and lowest quartiles are statistically different (p-value < 0.001). There is more variability across the quartile groups for the alphas, but using this measure as well the highest acquirer price-to-book quartile has significantly worse performance.

Thus far the evidence suggests that institutions retain more shares in deals with the highest acquirer price-to-book ratios, and that such deals have poorer post-merger performance. An institution’s wealth experience in a deal will depend on both its retention of shares and the acquirer’s post-merger performance, so in Panel C we examine metrics that combine both. The first is the acquirer’s post-merger excess return times the institution’s post-merger retention rate, *Excess Return*Retention Rate*. Similarly, we also construct a

metric using the acquirer’s alpha, $\text{Alpha} \times \text{Retention Rate}$.²⁰ Both metrics are significantly more negative in the highest acquirer price-to-book quartile, which implies that institutions are made worse off, on average, by how their trading differs across acquirers’ price-to-book ratios.²¹

4.2 The Effect of Investment Style Preferences

In practice, valuation metrics such as the price-to-book and market-to-book ratios are often used to indicate whether the acquirer is a growth (high P/B) or value (low P/B) stock. Hence, it is possible that our main results are due to institutions following their style preferences with respect to value or growth stocks. Additionally, it may also be the case that size preferences (small or large market capitalizations) affect retention rates.

Given the earlier results showing that rebalancing is more pronounced when measured after the merger, we focus our analysis on how the relation between *Post-Merger Retention Rate* and *Acquirer P/B* is affected by institutional style preferences. As in Abarbanell, Bushee, and Raedy (2003), we group institutions into four mutually exclusive categories based on their style preferences: large-cap growth, large-cap value, small-cap growth, small-cap value. We exclude 19 institutions (corresponding to 31 institution-merger observations) that cannot be classified, and the sample begins in 1981 (the first year for which we have style preference data). In Table VII we first report univariate statistics for *Post-Merger Retention Rate* for two broader categories: growth (which combines small- and large-cap growth institutions) and value (which combines small- and large-cap value institutions). The medians imply liquidations by at least half of institutions in both of the growth and value categories. When we categorize institutions into the four size-value/growth preference

²⁰We winsorize each metric at the top and bottom 1% level. Note we do not report medians in the table, because due to median post-merger retention rates being zero (see Table II), medians of each metric are also zero in each *Acquirer P/B* quartile.

²¹In untabulated results, we repeat the analysis by limiting the sample to institutions that do not liquidate their holdings, which allows us to investigate whether the results in Panel C are merely driven by liquidation decisions. Although the medians for $\text{Alpha} \times \text{Retention Rate}$ are close to -0.01% in each quartile and do not statistically differ, the medians for $\text{Excess Return} \times \text{Retention Rate}$ and the means for both $\text{Excess Return} \times \text{Retention Rate}$ and $\text{Alpha Return} \times \text{Retention Rate}$ are significantly more negative in the highest *Acquirer P/B* quartile (p-values range from <0.001 to 0.013).

groups, we observe greater share retention for the large-growth and large-value groups. This is perhaps not surprising since acquirers in the sample tend to be relatively large.

In Table VIII we estimate regressions to explain *Post-Merger Retention Rate* for each of the six subsamples reported in Table VII. In model (1) we report a regression on the sample of growth oriented institutions. The coefficient on $\text{Log}(\text{Acquirer } P/B)$ is 0.128 and the p-value is 0.002, implying that the share retention by these firms is increasing in the acquirer’s price-to-book. In model (2) we also find a preference by value-oriented firms for higher acquirer price-to-book (coefficient of 0.113 and p-value of 0.024). The magnitude of the effect for the value oriented firms is similar to that for the growth oriented firms. Thus, there appears to be a general preference for higher price-to-book acquirers regardless of preferences for growth versus value.²²

In model (3) we narrow the focus to large-cap, growth oriented institutions. The key variable of interest is $\text{Acq } P/B \text{ Top}Q \times \text{Acq Size Top}Q$, which is an indicator variable set to one for deals in which the acquirer is in the top sample quartile of both P/B and size. This variable identifies deals that may be particularly appealing to institutions that prefer large-cap, growth stocks, and its coefficient and p-value are 1.381 and 0.029, respectively. The coefficient, which exceeds one, and the significance level confirm a strong style effect in which these institutions are net buyers in deals that are more likely to conform to their style preference.

In model (4) we report a regression estimated with the large-cap, value oriented institutions. The indicator variable on $\text{Acq } P/B \text{ Bot}Q \times \text{Acq Size Top}Q$, which is set to one for deals these institutions are more likely to prefer (those with lower acquirer P/B and larger size) is not significant. It may be the case that there are few acquirers in the sample that these institutions view as truly being “value stocks” since acquirers in stock-driven acquisitions tend to have higher price-to-book values than targets (see Table I).

Turning the focus to small-cap, growth oriented institutions, in untabulated results we include the variable $\text{Acq } P/B \text{ Top}Q \times \text{Acq Size Bot}Q$ and find it is not significant. It is

²²We find qualitatively similar results using the RKR overvaluation measure.

unlikely, however, to find acquirers in our sample that will sufficiently appeal to small-cap oriented institutions on the basis of size. As panel A of Table I shows, the acquirers in the sample tend to be considerably larger than the targets. Hence, in model (5) we include $Acq\ P/B\ BotQ \times Acq\ Size\ TopQ$ which identifies deals these institutions should particularly *dislike* on the basis of both size and price-to-book. Indeed, this variable’s coefficient is negative and statistically significant. The coefficient’s value of -0.555 suggests that controlling for other factors, these institutions retain 55.5% fewer shares when the acquirer is in the bottom quartile of P/B and the top quartile of size.

Finally, when we only include small-cap, value oriented institutions in the regression, in untabulated results we find that an indicator variable defined to identify deals these institutions are more likely to prefer ($Acq\ P/B\ BotQ \times Acq\ Bot\ TopQ$) is not significant. As before, we conjecture this is because there are few sample deals that actually have small-cap acquirers. Therefore in model (6) we once again focus on identifying deals these institutions should particularly dislike, in this case by including $Acq\ P/B\ TopQ \times Acq\ Size\ TopQ$. This variable is insignificant. However, we do observe a negative and significant coefficient on $Acq\ Size\ TopQ$, an indicator variable set to one if the acquirer’s size is in the top quartile. The negative, significant coefficient is consistent with a dislike of larger acquirers.

To summarize, the strongest style preferences are observed for institutions that favor growth stocks. The regressions show that large-cap, growth-oriented institutions are net buyers in deals whose acquirers fit their preferences. Furthermore, small-cap growth-oriented institutions retain fewer shares in deals whose acquirers do not fit their preferences.

5 Conclusion

In this paper we study the trading behavior of institutions that own meaningful stakes in target firms but not in the acquirers in completed stock-for-stock acquisitions. Theoretical and empirical evidence in the literature commonly associates such deals with overvalued acquirer stock. We investigate whether trading by institutional owners of the target is

affected by the degree to which the acquirer stock is potentially overvalued on the basis of widely used valuation ratios such as price-to-book of equity and market-to-book of assets.

One possibility is that institutions recognize overvaluation and sell more aggressively in deals in which the acquirer is more likely overvalued (Shleifer and Vishny (2003)). Examining over 1,000 completed stock-financed deals during 1980-2006, we find the opposite. Although 56% of institutions in our sample liquidate their shares, consistent with high rates of institutional share turnover documented in prior literature, such liquidations are significantly less likely when the acquirer has a higher price-to-book value of equity or market-to-book of asset values. Further investigation reveals this is particularly true for institutions that favor large, growth stocks in their holdings—on average, these institutions are net *buyers* in deals with large acquirers that have high valuation ratios. Institutions with other style preferences are net sellers on average, but their trading is nonetheless affected by their style preferences. We also find that post-merger returns appear to be worse for acquirers with higher valuation ratios, and that share retention rates are higher in deals with higher degrees of overvaluation as measured by RKR's market-to-book decomposition method.

Overall, the evidence suggests that, perhaps in part due to style preferences, institutions do not appear on average to trade in a manner that is consistent with recognizing and responding to acquirer overvaluation in stock-financed acquisitions as measured by widely used valuation measures as well as the market-to-book decomposition in RKR. In light of target management's incentives often being skewed by the acceleration of stock option exercise, severance pay, or employment deals (Shleifer and Vishny (2003)), our results may help reconcile why target firms accept stock-financed deals that, on average, appear to have poorer long-term performance than cash deals (e.g., Loughran and Vijh (1997) and Mitchell and Stafford (2000)).

Our results also highlight the importance of shareholder composition along a dimension that is only recently beginning to be explored, namely, institutional investor style preferences (see, for example, Abarbanell, Bushee and Raedy (2003)). Examining the effects of such style preferences on other corporate events should provide fertile ground for future research.

Appendix

Data Definitions

Institution Variables

Institution Size: The aggregate market value of stock ownership across all holdings by the institution at the latest quarter-end prior to the deal announcement.

Percent of Portfolio: The dollar value of holdings in the target stock divided by *Institution Size*, measured at the latest quarter-end prior to the deal announcement, expressed as a percent.

Post-Merger Retention Rate: The number of post-merger acquirer shares owned (measured at the second quarter-end after the effective date) divided by the number of expected shares owned assuming all target shares owned prior to the announcement were held and converted into acquirer shares at the exchange ratio, winsorized at the top 1%.

Pre-Announcement Holdings: The percent of target stock owned by the institution at the latest quarter-end prior to the deal announcement.

Pre-Merger Retention Rate: The number of target shares owned at the latest quarter-end prior to the merger's effective date divided by the number of shares owned at the latest quarter-end prior to the merger announcement, winsorized at the top 1%.

Scaled Inst Size: *Institution Size* divided by the total market capitalization of stocks covered on CRSP, measured 20 trading days prior to the deal announcement.

Institutional Style Variables

The investment style classifications are based on each institution's preference for large vs. small market capitalization firms and value vs. growth firms as described in Abarbanell, Bushee and Raedy (2003).

ACAR(-1,+1): The acquirer’s announcement-period cumulative abnormal return (CAR), computed for the three-day period around the acquisition announcement date (day 0) using the market model (trading days –250 to –20 prior to deal announcement) using the CRSP value-weighted market return.

Acquirer Leverage: Total debt divided by total asset, computed at the latest fiscal year end prior to the deal announcement date.

Acquirer MA/BA: The market-to-book value of assets of the acquirer, which is the ratio of the market value of equity plus the book value of liabilities to the book value of assets. Book value of assets is defined as total assets and book value of liabilities is defined as total liabilities, measured at the latest fiscal year end prior the deal announcement. Market value of equity is from CRSP and is measured 20 trading days prior to the acquisition announcement date. *MA/BA* is winsorized at the 1% and 99% levels.

Acquirer P/B: The acquirer’s price-to-book value of equity, which is the ratio of the market value of equity to the book value of equity. Market value of equity is measured 20 trading days prior to deal announcement, and book equity is measured at the end of the latest fiscal year prior to the deal announcement. When a firm has negative book value, following Dong, Hirshleifer, Richardson and Teoh (2006), we assign the maximum value of P/B in the sample (after winsorizing P/B at 1% and 99%).

Acquirer P/B TopQ: An indicator variable set to one if *Acquirer P/B* is in the top sample quartile.

Acquirer Size: Market value of common equity of the acquirer from CRSP, measured 20 trading days prior to deal announcement.

Alpha: The acquirer’s alpha from a Fama-French four factor regression model (returns over the risk-free rate regressed on the CRSP market return, HML, SMB and Carhart’s

momentum factor) using 36 monthly returns beginning the month after the merger's completion.

Average Inst Trading: The weighted average cumulative abnormal return of the target and acquirer firms measured over trading days -63 to +126 relative to the merger announcement date using a market model (estimated over 318 to 64 trading days prior to the merger announcement date using the CRSP value-weighted index for the market return).

Change in Acquirer P/B: Acquirer P/B minus the P/B of the acquirer measured one year prior.

Days to Completion: Number of days between the announcement date and the effective date of the merger.

Excess return: The acquirer's return minus the market's return over the 36 months beginning the month after the merger's completion, where the CRSP value-weighted return is used for the market return.

Non-Diversifying: An indicator variable set to one if the acquirer and target share the same three-digit SIC code.

Relative Acquirer Size: Market value of common equity of the acquirer divided by the market value of common equity of the target, both taken from CRSP, measured 20 trading days prior to deal announcement.

Relative P/B: The ratio of the acquirer's price-to-book ratio to that of the target's.

RKRV Long-Run Value-to-Book: The acquirer's Long-Run Value-to-Book from the market-to-book decomposition in Rhodes–Kropf, Robinson and Vishwanathan (2005).

RKRV Overvaluation: The sum of the acquirer's firm specific error and time series sector error from the market-to-book decomposition in Rhodes–Kropf, Robinson and Vishwanathan (2005).

TCAR(-1, +1): The target's three-day announcement return, defined similar to *ACAR(-1, +1)*.

Target Leverage: Leverage ratio of the target, defined similar to *Acquirer Leverage*.

Target MA/BA: The market-to-book value of assets of the target, defined similar to *Acquirer MA/BA*.

Target P/B: The target's price-to-book value of equity, defined similar to *Acquirer P/B*.

Target Size: The target's size, defined similar to *Acquirer Size*.

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