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The Valuation Effects of Investor Attention in Stock-Financed Acquisitions

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Abstract

Limited investor attention allows overvalued companies to engage in stock-financed acquisitions of listed target firms without experiencing significant reductions in their existing valuations. Our robust findings show that overvalued stock-paying acquirers that are subject to limited investor attention do not experience significant announcement period wealth losses. However, the overvaluation of these acquirers is corrected in the post-announcement period. On the contrary, the overvalued acquirers that receive high investor attention and use stock as the payment method in their listed-target acquisitions experience negative announcement period abnormal returns. The widely documented evidence that stock-financed acquisitions are associated with significant announcement period wealth losses is primarily driven by deals in which the acquirers are subject to high investor attention.

Keywords: investor attention, corporate takeovers, payment method, acquirer abnormal returns.

JEL Classification: G34.

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***Highlights (for review)**

- Investor attention affects the reaction to announced takeovers
- Low attention incentivizes overvalued firms to engage in stock-financed M&As
- These acquirers realize limited announcement period losses
- The overvaluation of these acquirers is only corrected in the long-run

The Valuation Effects of Investor Attention in Stock-Financed Acquisitions

Abstract

Limited investor attention allows overvalued companies to engage in stock-financed acquisitions of listed target firms without experiencing significant reductions in their existing valuations. Our robust findings show that overvalued stock-paying acquirers that are subject to limited investor attention do not experience significant announcement period wealth losses. However, the overvaluation of these acquirers is corrected in the post-announcement period. On the contrary, the overvalued acquirers that receive high investor attention and use stock as the payment method in their listed-target acquisitions experience negative announcement period abnormal returns. The widely documented evidence that stock-financed acquisitions are associated with significant announcement period wealth losses is primarily driven by deals in which the acquirers are subject to high investor attention.

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1. Introduction

One of the stylized findings in the Mergers and Acquisitions (M&A) literature is that stock-financed acquisitions of listed targets are associated with significant acquirer wealth losses relative to cash-financed counterparts (Fu et al., 2014; Fuller et al., 2002; Golubov et al., 2015; Travlos, 1987).[1] The negative acquirer abnormal returns associated with such M&As are interpreted as evidence suggesting that the acquiring firms are using their overvalued shares to finance their takeovers (Myers and Majluf, 1984). Emphasizing the role of stock overvaluation as a determinant of the payment method in M&A, the theoretical models of Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) depict firms that aim to benefit from market-optimism-driven overvaluation by being involved in M&As with target firms that are relatively less overvalued.[2] Jensen (2005), in turn, argues that overvalued equity erodes managerial discipline and leads to wasteful stock-financed acquisitions. As a result, equity investors treat the use of the acquirer's stock as the payment method in M&As as a signal that such stock is potentially overvalued. Consequently, they react to the announcement of such M&As by selling (or short-selling) the acquiring firm's shares (Travlos, 1987). Despite the rich volume of research outputs in the related field,[3] there are still noticeable gaps in our understanding of (a) the trade-off between the gains that the acquiring firms (and/or their managers) realize from stock-financed acquisitions when the acquirer's stock is considered to be overvalued and, (b) the shareholders wealth losses arising from the negative market reaction around to acquisition announcements.

In this paper we trace this issue by starting with the premise that the attention of equity investors that is dedicated to the acquiring firm is a scarce cognitive resource (Barber and Odean, 2008; Kahneman, 1973). We primarily argue that the degree of investor attention that an overvalued (acquiring) firm receives affects its short- and long-run abnormal returns following the announcement of a merger. Previous research emphasizes the role of investor attention in influencing the market's reaction (i.e., abnormal returns) to corporate announcements. Among others, DellaVigna and Pollet (2009) document a weak stock market reaction to the release of corporate news on Fridays due to the investors' distraction with their weekend plans. Similarly, Hirshleifer et al. (2009) report evidence suggesting that the stock market's reaction to earnings surprises is weak on days during which other firms announce earnings surprises. Even if the stock market ends up accommodating the impact of bad news, the corporate managers' main bet is that the slow dissemination of the bad news revealed in their corporate

[1] The analysis in this paper is limited to the acquisitions of listed target firms. Accordingly, the term 'acquisition' or 'M&A' throughout this paper refers exclusively to listed-target acquisitions.
[2] There are several reasons why the management of the target firm accepts the acquiring firm's overvalued stock as the payment method in an acquisition. These range from the opportunistic desire of the target management to cash out quickly before the completion date of the deal (Shleifer and Vishny, 2003) to the overestimation of the takeover synergies form the target firm's point of view (Rhodes–Kropf and Viswanathan, 2004), among others.
[3] For a review see Eckbo (2009).

announcements reduces the reputational sanction that they might anticipate (DeHaan et al., 2015). Because the content of takeover announcements tends to be highly complex and less standardized than other corporate announcements such as earnings or dividends (Louis and Sun, 2010), we predict that overvalued firms that are exposed to limited investor attention manage to engage in stock-financed acquisitions without experiencing significant announcement period wealth losses.

A simplified example can further depict how the stock market's reaction to two stock-financed (listed-target) acquisitions, that are announced by two overvalued firms, depends on the degree of investor attention that each of the acquiring firms receives. Take the case of two firms *i* and *j* whose securities are equally overvalued. Such information is only (temporarily) known by the insiders of each of the firms. However, firm *i* receives more investor attention than firm *j*. If the managers of both firms are short-term oriented and expect the same short-term aggregate payoffs from the stock-financed acquisitions, the low investor attention dedicated to firm *j* potentially limits the size of the initial and negative market reaction. That is, even if the use of stock as a payment method raises doubts by equity investors that firm *j*'s shares are overvalued, these investors require an extended period to collect the relevant, and perhaps previously overlooked, information to re-assess the valuation of firm *j*. On the contrary, due to the increased investor scrutiny, firm *i*'s decision to engage in a stock-financed acquisition is likely to trigger significant announcement period declines in its existing valuation, which erodes a large part of the short-term payoffs.

This analysis leads to a rich set of empirical predictions about the acquirer's short- and long-run abnormal returns associated with stock-financed M&As. We primarily argue that these abnormal returns will be dependent on the degree of investor scrutiny that the acquiring firm is receiving during a sufficient period preceding the day of the merger announcement. First, if limited investor attention reduces the degree of the stock market's reaction to overvaluation-driven stock-financed acquisitions, we expect the overvalued firms that are subject to limited investor attention to be more actively involved in stock-financed acquisitions relative to counterparts that are subject to high investor attention. Second, we expect the overvaluation-driven stock-financed acquisitions announced by acquirers subject to limited investor scrutiny to be associated with limited wealth losses in the short-run relative to counterparts that are subject to high investor attention. Lastly, if the initial market reaction to stock-financed acquisitions announced by overvalued acquirers that are exposed to limited investor attention is imperfect, we expect these acquirers to experience negative post-acquisition abnormal returns relative to counterparts that receive high investor attention.

By using the acquirer's pre-acquisition trading volume as a proxy for the degree of investor attention, in addition to the overvaluation measure estimated using the method proposed by Rhodes-Kropf

et al. (2005), the empirical analysis in this paper offers several new and compelling findings. First, evidence from our Logit model predicting the choice of the payment method in the M&A suggests that overvalued acquirers that are subject to low investor attention are more likely to engage in stock- rather cash-financed deals. This finding reinforces the notion that low investor attention encourages acquirers to announce their overvaluation-driven stock-financed deals by anticipating limited reductions in their current valuations.

Second, our analysis of the announcement period Cumulative Abnormal Returns (CAR) suggests that overvalued acquirers subject to low investor attention do not experience significant announcement period wealth losses around stock-financed acquisitions. Specifically, we find that stock-financed acquisitions that are announced by overvalued acquirers subject to low investor attention break-even as in the case of cash-financed acquisitions. On the contrary, overvalued acquirers subject to high investor attention experience 4 to 6 percentage point declines around the announcement day of stock-financed acquisitions.

To assess the robustness of our findings, we rely on the Propensity Score Matching (PSM) method and re-assess the valuation effects of investor attention across stock-financed deals. Our PSM-based (robust) findings reveal that the stock-financed deals in which the acquirer is subject to low investor attention yield announcement period CAR that is 3.5 percentage points higher than the CAR of comparable deals in which the acquirer is subject to high investor scrutiny. To determine the sensitivity of our PSM-based findings to the bias caused by potential missing covariates from the matching exercise, we rely on the Rosenbaum (2002) bounds analysis. This methodology quantifies the effect that a missing covariate should have on the likelihood of the acquirer's classification into the low investor attention group to invalidate our (PSM-based) conclusions. The findings suggest that, for two comparable deals, a missing covariate should increase the likelihood of the acquirer's exposure to low investor scrutiny by more than 50% to invalidate our PSM-based conclusions. When assessed relative to previous findings in the corporate finance literature (Barbopoulos and Adra, 2016; Peel and Makepeace, 2012), this evidence suggests that our findings are, to a large extent, insensitive to the effect of a confounding variable.

To further highlight the role of the acquirer's overvaluation and its interaction with the degree of investor attention dedicated to the acquiring firm, we re-estimate our multivariate regressions on the matched (treated and control) sample. The results confirm our initial conclusions by emphasizing a significant negative valuation effect of the acquirer's overvaluation in deals subject to high investor attention. Moreover, this negative wealth effect is neutralized in the group of deals announced by acquirers subject to low investor attention.

Our third task is to examine the stock market's potential time fractions in assessing the valuation effects of overvaluation-driven stock-financed acquisitions announced by companies subject to low (high) investor attention. Our analysis reveals that overvaluation-driven stock-financed acquisitions that are announced by acquirers subject to low investor attention are associated with significant post-acquisition losses. Put together, these findings suggest that the correction of the acquirer's overvaluation is not immediate but rather depends on the degree of attention dedicated by equity investors to the acquiring firm during the period preceding the M&A announcement. Overall, the widely cited evidence that stock-financed M&As are associated with immediate announcement period wealth losses is driven by deals announced by acquirers subject to high rather than low investor attention during the period preceding the M&A announcement. The overvaluation of stock-paying acquirers subject to limited investor attention is only corrected in the long-run.

The results of this paper contribute to the arrays of studies related to both M&A and investor scrutiny. Specifically, this paper highlights the moderating role of investor scrutiny in the relationship between the choice of payment method in M&A and the acquirer abnormal returns. Shleifer and Vishny (2003) and Rhodes-Kropf and Viswanathan (2004) emphasize the role of the acquiring firm's overvaluation in motivating the initiation of stock-financed acquisitions. In the attention-related literature, Louis and Sun (2010) show that the stock market's reaction to stock swap acquisitions is muted on Fridays. Louis and Sun (2010) attribute this result to the limited investor attention of stock market participants preoccupied with their weekend plans. Our findings extend both results by showing that overvalued acquirers exploit the limited investor scrutiny to announce their stock-financed acquisitions. Moreover, our analysis of the long-run wealth effects of stock-financed acquisitions demonstrates that the stock market requires a considerable period to correct the acquirer's overvaluation when the acquiring firm is subject to low market scrutiny. Our results also complement the recent findings by DeHaan et al. (2015) and Michaely et al. (2016) related to the efforts of corporate managers to exploit the limited investor attention to strategically time their corporate announcements. Lastly, our findings are robust to alternative model specifications and measures of investor attention such as the Roll (1988) non-synchronicity measure.

We proceed as follows: Section 2 presents a parsimonious model that determines the conditions under which overvalued acquirers proceed with stock-financed M&As without experiencing large announcement period wealth losses; Section 3 describes our proxies of investor attention and acquirer overvaluation; Section 4 presents our dataset and discusses both the sample statistics and the univariate results; Section 5 presents and discusses the sensitivities related to the decision of the acquirer to use its stock in the financing process of the deal, as well as the multivariate analysis of the acquirer short-run

abnormal returns; Section 6 illustrates the PSM-based findings and the Rosenbaum (2002) bounds sensitivity analysis; Section 7 discusses the long-run acquirer abnormal returns; Section 8 demonstrates how our multivariate results hold when we employ an alternative measures of acquirer investor attention: the Roll R^2, and finally, Section 9 offers a conclusion.

2. The Choice of Overvaluation-driven Stock Financing

Consider a potential acquiring firm whose market value temporarily exceeds its fundamental value by $\pi > 0$, which is only known to the acquiring firm's insiders. The insiders, who understand the temporary aspect of this overvaluation, are considering the prospects of exploiting their excess valuation in a stock-financed acquisition to realize short-term payoffs from increasing their firm's size. The net payoff from such acquisition is presented as follows:

$$Net\ Payoff = [S(1-\alpha) - c_1]\pi - c_2 \quad (1)$$

$S > 1$ is a factor representing the acquiring firm's ability to realize short-term gains before the entire extent of overvaluation is captured by equity investors. In the presence of principal agent problems, S can represent the managerial privileges after relying on stock-financing to increase their firm's size (Jensen, 2005). The costs associated with a stock-financed acquisition have two components. $c_1 > 0$ is a factor reflecting the additional deal-related costs that arise from the use of overvalued stock, as a fraction of the degree of overvaluation. For instance, if the firm insists on financing the deal with its own stock, the target firm might demand higher premium to participate in the deal. Therefore, the product $c_1\pi$ is the additional payment that the acquiring firm is willing to make to the target in order to convince the target shareholders to accept its shares as the medium of exchange. In turn, c_2 are costs of the deal such as target's valuation and the advisory fees.

α is the part of the acquiring firm's overvaluation that is corrected at the time of the deal's announcement with $0 \leq \alpha \leq 1$. Because the value of α is primarily dependent on the extent to which the market participants investigate the acquirer's degree of overvaluation and their attempts to correct it, can be presented as follows:

$$\alpha = \beta A \quad (2)$$

with $\beta > 0$. The size of α is a positive function of A which is the level of investor attention dedicated to the acquiring firm. Even if the acquirer uses overvalued shares as a payment method in the deal, the limited investor attention dedicated to the acquiring firm during the period preceding the deal's announcement complicates the task of market participants to correctly re-valuate the acquirer's shares. In particular, in order to accurately determine the extent of the acquirer's overvaluation, market participants have to re-assess the information released through previous corporate announcements, accounting data,

and price fluctuations that they have overlooked. Given that various other corporate events are also competing for the investors' attention, the task of re-evaluating the acquirer's shares is likely to require an extended period beyond the limited window around the takeover announcement.

Replacing (2) in (1) with $Net\ Payoff > 0$ yields:

$$A < \frac{[S - c_1]\pi - c_2}{\beta S \pi} \tag{3}$$

When the level of investor attention is relatively high, i.e. above the threshold $\frac{[S-c_1]\pi-c_2}{\beta S\pi}$, the announcement of a stock-financed deal leads to substantial corrections in the acquirer's existing valuation. Such corrections erode the gains that the acquirer expects from the deal. In the presence of agency problems, the significant announcement period wealth losses can also jeopardize the position of the acquiring firm's managers that decide to engage in a wealth-destroying overvaluation-driven acquisition.

The immediate consequence of this argument is that firms subject to limited investor attention $\left(A < \frac{[S-c_1]\pi-c_2}{\beta S\pi}\right)$ are encouraged to use their overvalued shares as the medium of exchange in M&As. Empirically, we predict that the acquiring firms subject to limited investor scrutiny announce overvaluation-driven stock-financed M&As that are associated with limited short-run wealth losses. We further predict that the overvaluation of these acquiring firms is only corrected in the post-M&A-announcement period.

3. Measures of Investor Attention and Firm Overvaluation

This section presents the investor attention proxy that we employ in this paper, as well as the measures of valuation error of the acquiring firm. The proxy for investor attention is based on the fraction of the acquirer's traded shares relative to its listed shares in the days preceding the acquisition announcement.[4] The underlying assumption supporting this proxy is that the firms subject to high investor attention are those with relatively large fraction of their shares subject to daily trading activity. The measure of firm-specific overvaluation, in turn, is based on the method proposed by Rhodes-Kropf et al. (2005) via which we decompose the acquiring firm's market-to-book value ratio.

[4] In the robustness section, we use the Roll's R^2 measure as a proxy of investor attention. We discuss in detail the relevance of this proxy in the Section 8. We thank an anonymous reviewer for encouraging the incorporation of a second measure in our analysis.

3.1. Trading volume

The volume of a firm's traded shares has been used in previous research as a proxy of the degree of investor attention. The seminal paper of Miller (1977) suggests that high trading volume causes investors to look in more detail at a particular stock. Gervais et al. (2001) show that the increase in a stock's trading volume boosts its visibility and leads to high demand. The same authors show that stocks subject to high trading activities are traded at a premium. Kaniel et al. (2012) further show that the value-return premium is present in both developed and developing markets. They also attribute their results to Merton's (1987) recognition theory which suggests that the increase in attention to particular stocks boosts their value due to (a) the reduction in the estimation risk faced by traders and, (b) the facilitation of risk sharing.

In this paper, we use the standardized trading volume of the acquiring firm before the acquisition announcement as a measure of investor attention. For the period from 43 to 10 days before the acquisition announcement, we estimate the average daily percentage of the traded shares relative to all listed shares. An acquiring firm is considered subject to high investor attention when the average daily percentage of traded shares relative to all listed shares exceeds the 70th percentile in the corresponding sample (i.e. High Trading). Otherwise, the firm is considered subject to low pre-acquisition investor attention and consequently subject to low trading activity (i.e. Low Trading).[5]

3.2. Firm Overvaluation and Book-to-Market Decomposition

In order to quantify the degree of acquirer valuation error in our analysis, we decompose the book-to-market value of the acquirer into its components of growth option and misvaluation, as in Rhodes-Kropf et al. (2005) and Fu et al. (2014). Rhodes-Kropf et al. (2005) decompose a firm's market-to-book value ratio into three components: firm-specific valuation error, time-series sector-specific valuation error and, long-run growth potentials.

In particular, the log market-to-book value ratio $\left(ln\left(\frac{MV_{it}}{BV_{it}}\right)\right)$ can be presented as follows:

$$m_{it} - b_{it} = \underbrace{\left(m_{it} - v\left(BV_{it}, a_{jt}\right)\right)}_{firm-specific\ error} + \underbrace{\left(v\left(BV_{it}, a_{jt}\right) - v\left(BV_{it}, \bar{a}_j\right)\right)}_{time\ series\ sector\ error} + \underbrace{\left(v\left(BV_{it}, \bar{a}_j\right) - b_{it}\right)}_{growth\ option} \quad (4)$$

with m_{it} and b_{it} indicating the log of market value (MV) and book value (BV), respectively, of firm i at month t. $m_{it} - v\left(BV_{it}, a_{jt}\right)$ is the difference between the firm's valuation and its sector's valuation, which is represented by $v\left(BV_{it}, a_{jt}\right)$. $v\left(BV_{it}, a_{jt}\right) - v\left(BV_{it}, \hat{a}_j\right)$ is the difference between the sector-

[5] Our results remain insensitive to the use of different percentiles as cutoff points that determine whether the acquiring firm receives high or low investor attention, such as 75th, 80th, 85th, and 90th.

specific valuation and the long-run industry multiple $v(BV_{it}, \bar{a}_j)$. Finally, $v(BV_{it}, \bar{a}_j) - b_{it}$ is the long-run value-to-book measure of the firm, which is a proxy for its growth potentials.

We proceed by estimating the cross-sectional regressions of the acquirer's market value on its book value, by sector j and year t. Rhodes–Kropf and Viswanathan (2004) propose the following models:

$$ln(MV)_{it} = a_{jt} + \beta_{1jt} ln(BV)_{it} + \varepsilon_{it} \quad (5)$$

$$ln(MV)_{it} = a_{jt} + \beta_{1jt} ln(BV)_{it} + \beta_{2jt} ln(|NI|)_{it} + \beta_{3jt} \theta_{(NI<0)} ln(|NI|)_{it} + \varepsilon_{it} \quad (6)$$

$$ln(MV)_{it} = a_{jt} + \beta_{1jt} ln(BV)_{it} + \beta_{2jt} ln(|NI|)_{it} + \beta_{3jt} \theta_{(NI<0)} ln(|NI|)_{it} + \beta_{4jt} LEV_{it} + \varepsilon_{it} \quad (7)$$

where: $ln(BV)$ is the log book value of the acquiring firm i, $ln(|NI|)$ is the log absolute value of the acquirer net income, $\theta_{(NI<0)}$ is a binary indicator taking the value of 1 when $NI < 0$, and LEV is the market leverage of firm i. Our reported estimations are obtained through the Equation (5).[6]

Therefore, we predict the firm- and industry- specific valuation errors of firm i by using the fitted coefficients from Equation (5) and their average values as:

$$v(BV_{it}, a_{jt}) = \hat{a}_{jt} + \hat{\beta}_{1jt} ln(BV)_{it} \quad (8)$$

$$v(BV_{it}, \bar{a}_j) = \bar{a}_j + \bar{\beta}_{1j} ln(BV)_{it} \quad (9)$$

with

$$\bar{a}_j = \sum_{t=1}^{T} \frac{\hat{a}_{jt}}{T} \quad (10)$$

$$\bar{\beta}_{j1} = \sum_{t=1}^{T} \frac{\hat{\beta}_{j1t}}{T} \quad (11)$$

which predict the two misevaluation components, as:

$$Firm\ Specific\ Error\ = m_{it} - v(BV_{it}, a_{jt}) \quad (12)$$

$$Sector\ Specific\ Error = v(BV_{it}, a_{jt}) - v(BV_{it}, \bar{a}_j) \quad (13)$$

Accordingly, our overall acquirer overvaluation measure is the sum of both the firm- and sector-specific valuation errors. To reduce the impact of the measurement error in our subsequent analysis, rather than introducing the continuous overvaluation measure, we use the dummy variable $Overvalued\ Acquirer$ which is assigned the value of 1 if the acquirer has a positive valuation error, and 0 otherwise.

[6] Our results remain qualitatively similar with slightly smaller samples when Equations (6) and (7) are estimated.

4. Data

4.1. Sample construction

Our sample consists of all US domestic friendly public-to-public M&A from the Securities Data Corporation's (SDC) Thomson One Database that satisfy the following sample-selection criteria: (a) the M&A is announced between January 1st, 2002 and December 31st, 2014 and the deal was completed with a disclosed dollar value that exceeds the $1 million threshold; (b) the acquirer controls 100% of the target shares at the deal's completion date; (c) the deal payment is settled in either cash or stock; and (d) no takeovers by the same acquirer occur within five trading days around the deal announcement (i.e. the event window analyzed). Finally, the acquiring and the target firms' stock prices, proxies for the acquirer and target valuation errors (see Equations 4 to 13), and market-to-book values of both the acquirer and target firms are covered in the Datastream database and verified in Compustat.

The restriction that both merging firms are publicly listed ensures that the relevant firm-specific variables are disclosed and hence available to be used in our empirical analysis. The restriction that the acquirer ends up controlling 100% of the target is introduced to ensure that the acquirers in the sample have the same objective of full target ownership. Moreover, the sample is limited to full cash and full stock financed deals in order to explicitly distinguish between the two payment methods across our analysis, as in Golubov et al. (2015).

Table 1 presents the annual distribution of our sampled deals (=513) according to the payment method of the deal, acquirer and target industry relatedness, and the target firm's specific industrial sector. Panel A shows the annual distribution of the deals in which: (a) cash or stock is used as the payment method, and (b) the acquisitions are either focused (diversifying) whereby the acquirer and the target do (not) share the same two-digit SIC code. Panel A depicts a pro-cyclical variation in M&A activities with a peak in 2007 (68 deals) followed by a decline during the years of the great recession (38 yearly deals in 2008 and 2009). The same Panel also shows that the largest fractions of M&As in the sample are cash-financed (65.89%) and industry focused (64.13%). At the target firm's industrial sector level (reported in Panel B), the largest fractions of deals in the sample are in the high technology and financial sectors, with respective percentages of 28.27% and 22.81%. In turn, the lowest fractions of deals in the sample are in the retail, real estate and media sectors.

(Insert Table 1 about here)

Table 2 presents the descriptive statistics of the key variables entering our empirical analysis, i.e. firm- and deal-specific factors that are controlled for in our multivariate analysis. As in Barbopoulos et al., (2012) and Fuller et al. (2002), the acquirer CAR is measured as the sum of the daily differences between the acquirer returns and the returns of an overall market index (NYSE firms) over the 5-day

event-window (t-2, t+2) around the deal's announcement day (i.e. day t=0). The acquirer CAR mean of 0.23% confirms the findings in previous research that the average M&A does not add value to the shareholders of the acquiring firm (Alexandridis et al., 2010). However, the high standard deviation of the acquirer CAR suggests a substantial variation in the acquirer's wealth effects. To measure the post-acquisition returns, we follow Barbopoulos and Sudarsanam (2012) by estimating the acquirer's holding period excess returns over the corresponding market index returns, which are estimated for the holding periods of 12 and 24 months from the end of the acquisition completion month. We exclude the multiple deals announced by the same acquirer during, before and after the calendar month of the acquisition announcement to ensure that the long-run acquirer abnormal returns in various deals are not conflated. Our initial findings suggest that M&As are, on average, associated with post-acquisition declines of the acquirer value in the 12 months (-6.33%) and 24 months (-9.19%) following the second month from the acquisition's announcement month, consistent with earlier studies such as Loughran and Vijh (1997).

(Insert Table 2 about here)

To ensure that the size and growth opportunity of both merging firms are properly controlled for in our analysis, the acquirer and the target firms' market values and market-to-book value ratios, at 43 days before the acquisition's announcement day, are introduced in the relevant models. Moreover, to highlight the relevance of the pre-acquisition variation of the merging firms' returns, both the acquiring and the target firms' standard deviations of abnormal returns during the period from t-240 to t-43 days, where t is the acquisition's announcement day, are added. To control for the effect of toeholds and the presence of large block-holders, (a) the percentage of target shares owned by the acquiring firm before the deal announcement, and (b) the presence of a positive percentage of acquirer's shares that are closely held by block-holders, are introduced to the model. While Datastream reports the percentage of target shares that are closely held by a small number of shareholders, the inclusion of this variable in the analysis substantially reduces the sample in the estimation. For the same reason, only the acquirer's debt-to-assets ratio and returns on assets 43 days before the announcement of the deal are added in the model. Appendix 1 provides a detailed description, as well as the source and construction of each variable that we use in our analysis.

Based on our estimation of the acquirer's valuation-error measure, the acquirers in 247 deals overall, and in 73 stock-financed acquisitions, are classified as overvalued, i.e. with a positive Rhodes-Kropf et al. (2005) valuation-error. In robustness checks, we impose higher cut-off values to determine whether the acquirer is overvalued such as the 5%, 10%, and 15% levels without finding an alteration in our conclusions.

4.2. Univariate analysis

Table 3 presents the results of our univariate analysis of the acquirer CAR across portfolios classified by the payment method and the levels of pre-acquisition trading activity of the acquirer's shares. Consistent with the conclusions reached in previous studies, the univariate analysis suggests that stock-financed acquisitions are associated with significantly lower acquirer CAR relative to cash-financed counterparts (1.18 percentage points lower acquirer CAR that is marginally significant). Interestingly, the substantial reduction in the acquirer CAR in stock-financed acquisitions is concentrated in the group of deals announced by acquirers subject to high investor attention. This portfolio experiences significant wealth losses relative to both the portfolio of cash-financed deals (3.18% wealth loss, significant at the 5% level) and the portfolio of stock-financed deals that are announced by acquirers subject to low investor attention (3.28% relative wealth loss, significant at the 5% level). In the latter portfolio, the acquirer CAR of -0.09 percentage points is statistically insignificant. Nevertheless, the magnitude of the acquirer's shareholder wealth losses from stock-financed M&As when the acquirer is subject to low investor attention is apparent in the post-acquisition period. Specifically, in the 12- and 24-month post-acquisition period, the stock-financed M&As that are announced by acquirers subject to low investor attention are associated with 8.5 and 12.66 percentage point declines of the acquirer value, as captured by the acquirer Buy-and-Hold Abnormal Returns (BHAR).

(Insert Table 3 about here)

The univariate differences in the post-acquisition abnormal returns between the stock-financed M&As subject to high investor attention and their counterparts subject to low investor attention are economically large, yet statistically insignificant. In the subsequent sections, we re-evaluate these differences via a multivariate analysis that further allows us to highlight the impact of the acquirer's pre-acquisition overvaluation.

5. Multivariate Evidence

5.1. The acquirer's overvaluation and the choice of the payment method

A central part of our analysis is to investigate whether low investor attention encourages overvalued acquirers to proceed with stock-financed M&As. As such, overvalued acquirers subject to low investor attention should be more likely to announce stock- rather than cash-financed M&As. Table 4 presents the outcome of two Logit models that predict the choice of the payment method (stock vs. cash) based on the acquirer's valuation-error and various firm- and deal-specific features. Model (1) does not control for year- and industry-related factors while Model (2) does take them into account.

(Insert Table 4 about here)

The initial findings emphasize the role of low investor attention in encouraging overvalued acquirers to announce stock- rather cash-financed M&As. In particular, the coefficient associated with the variable (Overvalued Acquirer × Low Trading) is positive, significant, and considerably larger in magnitude than the coefficient of (Overvalued Acquirer) both when the industry and year effects are included and excluded from the relevant model. This finding supports our empirical prediction by suggesting that overvalued acquirers subject to low rather than high trading activity are more likely to announce stock-financed M&As. The following subsection examines whether such acquirers, despite their high degree of overvaluation, end up realizing limited wealth losses during the announcement period due to the low investor attention dedicated to them.

5.2. Multivariate Analysis of CAR

The findings reported in Table 5 depict the valuation effects of stock-financed M&As that are announced by acquirers subject to different levels of investor attention. The dependent variable is the acquirer's 5-day announcement period CAR. Models (1), (2) and (3) have the following general specification:

$$Acquirer\ CAR_i = \alpha_1 + \alpha_2 Stock_i + \alpha_3 (Stock_i \times Low\ Trading_i) + \sum_{j=1}^{k} \beta_j X_{ij} + \varepsilon_i \qquad (14)$$

α_1 is the intercept referring to the acquirer CAR in cash-financed acquisitions. $\alpha_1 + \alpha_2$ refers to the average announcement period CAR of stock-financed deals by acquirers that receive high investor attention. In turn, $\alpha_1 + \alpha_2 + \alpha_3$ is the acquirer announcement period CAR of stock-financed deals in which the acquirer receives low investor attention (i.e. low pre-acquisition trading activity). Accordingly, α_3 represents the difference between the valuation effects of stock-financed acquisitions that are announced by acquirers subject to low versus high investor attention. $\sum_{j=1}^{k} \beta_j X_{ij}$ represents the effects of k control variables known to influence the acquirer abnormal returns.

Model (1) is a baseline regression that only controls for the effect of the payment method and the level of investor attention received by the acquiring firm. The evidence reported in Model (1) suggests that, relative to cash-financed deals, stock-financed acquisitions announced by acquirers subject to high pre-acquisition trading activity experience a 4.41 percentage point decline in their existing valuations. As documented in previous research (Barbopoulos and Sudarsanam, 2012; Draper and Paudyal, 1999; Fuller et al., 2002), cash-financed deals realize insignificant announcement period abnormal returns, as evidenced by the insignificant intercept. Furthermore, consistent with our predictions, the stock paying acquirers that are subject to low investor attention realize 4.17 percentage points higher CAR than their counterparts who are subject to high investor attention. That is, the negative wealth effect of stock-

financed acquisitions when the acquirer is subject to high investor attention seems to be neutralized in the portfolio of stock-financed deals that are announced by acquirers subject to low investor attention.

(Insert Table 5 about here)

To further clarify this conclusion, we apply the Wald test on the restriction that the coefficient of (Stock) and the coefficient of (Stock × Low Trading) are equal in magnitude but have opposite signs. The resulting p-value is 0.80, leading to the non-rejection of the null hypothesis. Accordingly, the acquisitions announced by acquirers that are subject to low investor attention do not experience negative announcement period abnormal returns. Instead, the acquirers in these deals break-even, as in the case of counterparts in cash-financed acquisitions. Model (2) expands the specification of Model (1) by controlling for the effect of the acquirer's overvaluation, which yields similar conclusions. Moreover, the restriction that the coefficient of (Stock) and the coefficient of (Stock × Low Trading) are equal in magnitude but have opposite signs is also not rejected in Model (2) (p-values of 0.66).

Model (3) controls for various firm- and deal-related factors in addition to the industry and year fixed effects. The results of this model suggest that the stock-financed acquisitions announced by acquirers subject to high investor attention realize five percentage point decline in their existing valuations. Moreover, the stock-financed M&As announced by acquirers subject to low investor attention realize a four percentage point increase in their valuations relative to the stock-financed M&As that are announced by acquirers subject to high investor attention. The restriction that the coefficient of (Stock) and the coefficient of (Stock × Low Trading) are equal in magnitude but have opposite signs is not rejected either in Model (3) (p-value of 0.12).

To directly highlight the effect of acquirer's overvaluation and acquirer's investor attention on the acquirer CAR, Models (4) and (5) have the following specification:

$$Acquirer\ CAR_i = \alpha_1 + \alpha_2 Stock_i + \alpha_3 (Stock_i \times Overvalued\ Acquirer_i) + \alpha_4 (Stock_i \times Overvalued\ Acquirer_i \times Low\ Trading_i) + \sum_{j=1}^{k} \beta_j X_{ij} + \varepsilon_i \quad (15)$$

$\alpha_1 + \alpha_2 + \alpha_3$ is the average CAR of overvalued acquirers that are exposed to high investor attention and engage in stock-financed M&As. In turn, $\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4$ is the average CAR of overvalued acquirers that are exposed to low investor attention and engage in stock-financed M&As. Therefore, the sign and magnitude of α_4 reflect the impact of acquirer exposure to low investor attention on the market's assessment of stock-financed deals that are announced by overvalued acquirers. Interestingly, the results in Models (4) and (5) show that the negative valuation effects of acquirer overvaluation across stock-financed acquisitions that are announced by acquirers subject to high investor attention is offset in the portfolio of deals that are announced by acquirers subject to low investor attention. More specifically, the

Wald test of the restriction $\alpha_4 = -\alpha_3$ does not reject the null hypothesis with p-values of 0.14 and 0.48 in Models (4) and (5), respectively.

Put together, the results of our multivariate analysis support the key empirical prediction of this paper that the overvalued stock-paying acquirers subject to low investor attention manage to announce their takeovers without experiencing significant announcement period wealth losses. The Propensity Score Matching (PSM) analysis in the subsequent section further validates this conclusion.

6. Analysis of Comparable Deals

6.1. PSM analysis

The novel result presented in Section 5 suggests that stock-financed M&As that are announced by acquirers subject to low investor attention yield higher acquirer CAR relative to counterparts announced by acquirers subject to high investor attention. The matching-based analysis offered in this section examines whether this conclusion holds when comparing deals with similar characteristics. We apply the Propensity Score Matching (PSM) analysis exclusively on the sample of stock-financed acquisitions. To ensure that the matched sample is representative of treated and untreated observations, the dummy variable ('Low Trading' or 'Low Investor Attention') is assigned the value of 1 if the acquirer's percentage of pre-acquisition daily traded shares (traded relative to all shares) exceeds the median, rather than the 70th percentile, in the corresponding sample, and 0 otherwise. After balancing the key firm- and deal-related factors in addition to the magnitude of acquirer's overvaluation between acquirers exposed to low and high investor attention (i.e. between the treated and control portfolios), we estimate the valuation effects of low investor attention across stock-financed acquisitions.

Smith and Todd (2005) suggest that the Average Treatment Effect on the Treated (ATT) is the most common evaluation parameter. In the context of the present paper's analysis of the acquirer CAR, ATT can be defined as:

$$ATT = E(Acquirer\ CAR_{Low\ Trading} - CAR_{High\ Trading} | Low\ Trading = 1) \quad (16)$$

This parameter represents the average impact of low investor attention dedicated to the acquiring firm on the acquirer CAR relative to the counterfactual case in which the acquirer receives high investor attention. If the economic conclusion presented in Section 5 holds, we expect the resulting ATT to be positive, statistically and economically significant.

In estimating ATT, a missing data problem emerges: while we have access to the acquirer CAR in stock-financed M&As that announced by acquirers receiving low investor attention, we do not have access to data representing the counterfactual case in which these acquirers receive high investor attention. Nevertheless, Rosenbaum and Rubin (1985, 1983) show that conditioning on known propensity

scores $P(W)$ that have been estimated using observable characteristics W, with each propensity score representing the probability of the acquirer receiving low rather than high investor attention, is sufficient to remove the bias due to these observed covariates. Consequently, we adopt the following two-step procedure: *First*, on the restricted sample of stock-financed deals, we estimate a Logit model based on the acquirer-, deal- and target-specific characteristics with the dependent variable being the acquirer that is subject to low pre-acquisition trading activity (i.e. low investor attention). *Second*, the fitted probability estimates from this model (i.e. the propensity scores) are used in the matching analysis to create a matched sample of comparable deals that are announced by acquirers exposed to low and high investor attention. On the matched sample ATT is estimated with the following equation:

$$ATT = \frac{\sum_{i:Low\ Trading=1}\{Acquirer\ CAR_i(Low\ Trading_i) - Acquirer\ CAR_i(High\ Trading_i)\}}{N} = \frac{\sum_{i=1}^{N}\left\{\left(Low\ Trading_i - \left(1 - Low\ Trading_i\right)\frac{K_M(i)}{M}\right) Acquirer\ CAR_i\right\}}{N} \quad (17)$$

ATT is the mean difference between the acquirer CAR in each stock-financed deal that is announced by an acquirer subject to low trading, $Acquirer\ CAR_i(Low\ Trading_i)$, and the mean acquirer CAR for comparable stock-financed deals that are announced by acquirers subject to high pre-acquisition trading, $Acquirer\ CAR_i(High\ Trading_i)$. N is the number of stock-financed deals that are announced by acquirers subject to low pre-acquisition trading on the matched sample (i.e. the treated observations). M is the number of control (observations) deals that are announced by overvalued acquirers subject to high investor attention. $K_M(i)$ is the number of times a deal i is used as a match when matching is performed with replacement.

More specifically, based on the caliper matching (CM) algorithm, for each stock-financed deal announced by an acquirer subject to low pre-acquisition trading (i.e. treated observation), we match four stock-financed deals (untreated observations) that are announced by acquirers subject to high pre-acquisition trading which exhibit propensity scores that do not exceed 10% of the standard deviation of the propensity score estimates. As the sample is split in half between deals announced by acquirers subject to low and high pre-acquisition trading, we use matching with replacement whereby each untreated observation can be chosen as a match more than once. As Panel B (Table 6) shows, the resulting matched sample includes 24 treated observations and 96 untreated observations, whereby the matches are used more than once. Overall, 36 observations are dropped from the sample of stock-financed deals via the matching algorithm. Panel D (Table 6) demonstrates the success of the matching exercise in balancing the key empirical covariates in the analysis. More specifically, none of the differences in the means of both the estimated propensity scores and the key covariates between the treated and untreated groups appear statistically significant based on the reported *t*-tests in the matched sample.

(Insert Table 6 about here)

The estimation of standard errors is of critical importance in testing the hypothesis of the absence of a treatment effect. Caliendo and Kopeinig (2008) emphasize the importance of incorporating the variance due to the estimation of propensity scores in the overall variance of the treatment effect. Abadie and Imbens (2008) show that estimators resulting from bootstrap procedures are not valid even under the simple conditions of a single continuous covariate and an unbiased $N^{1/2}$ normally distributed estimator. The results of the Abadie and Imbens (2008) simulation show that the variance estimator they developed earlier (Abadie and Imbens, 2006) tends to perform well even with small samples. Consequently, in testing the null hypothesis of zero ATT, the Abadie and Imbens (2006) standard errors are employed in the *t*-tests and reported with the ATT estimate.

As Panel B (Table 6) shows, the resulting ATT estimate is 3.5 percentage points and statistically significant at the 1% level. This offers great support to the initial conclusion derived from both the univariate and the multivariate analyses (presented in Section 5). That is, after balancing the key covariates, including the magnitude of the acquirer's and target's overvaluation on the matched sample, the stock paying acquirers subject to low pre-acquisition trading activity (or low investor attention) enjoy higher announcement period CAR relative to acquirers in comparable deals where the acquirers are subject to high pre-acquisition trading (or high investor attention). This provides additional evidence suggesting that firms that receive limited investor attention and use stock as a payment method in M&As enjoy significant appreciations in their existing valuations relative to stock paying acquirers that receive high investor attention.[7] However, one issue that still remains to be accommodated is to ensure that our results are insensitive to unobserved bias or missing covariates. In the following subsection, we examine the sensitivity of our PSM-based findings by quantifying the impact that a missing covariate should have in order to invalidate the treatment effect.

To assess whether the initial conclusion from our multivariate analysis holds on the matched sample, we estimate the following model on the sample of comparable stock-financed deals:

$$Acquirer\ CAR_i = \alpha_1 + \alpha_2 Overvalued\ Acquirer_i + \alpha_3 (Overvalued\ Acquirer_i \times Low\ Trading_i) + \sum_{j=1}^{k} \beta_j X_{ij} + \varepsilon_i \quad (18)$$

where α_2 is the acquirer CAR due to the announcement of an acquisition by an overvalued acquirer subject to high investor attention while $\alpha_2 + \alpha_3$ presents the acquirer CAR due to the announcement of an acquisition by an overvalued acquirer subject to low investor attention. The findings show that stock-

[7] On the matched sample, the average acquirer CAR of stock-financed acquisitions that are announced by acquirers subject to low pre-acquisition trading is -0.37% and statistically insignificant, which supports the view that these acquirers do not experience immediate announcement period wealth losses.

financed M&As that are announced by overvalued acquirers subject to high investor attention are associated with 11.5% decline in the acquirer existing valuation. However, in line with the conclusions of the initial multivariate analysis, this negative relationship is neutralized in the group of stock-financed M&As that are announced by overvalued acquirers subject to low investor attention.

6.2. Sensitivity analysis

A central aspect of the PSM method is that it mainly attempts to reduce the bias that is due to 'selection on observables' rather than 'selection on unobservables' (Heckman and Robb, 1985). Hence, the failure to introduce relevant variables to the matching analysis can lead to biased ATT estimates and inaccurate conclusions. Along these lines, Rosenbaum (2002) develops a sensitivity analysis that can accompany the use of PSM. In the context of this paper's analysis, the Rosenbaum (2002) sensitivity analysis answers the question: how strong a missing covariate needs to be, in terms of influencing the odds that the stock-financed acquisition is announced by an acquirer receiving low investor attention, in order invalidate the initial PSM-based conclusions?

In his analysis, Rosenbaum (2002) presents the parameter Γ which in the context of this paper's analysis can be presented in the following relation:

$$\frac{1}{\Gamma} \leq \frac{\frac{P_i(Low\ Trading = 1|W)}{1 - P_i(Low\ Trading = 1|W)}}{\frac{P_j(Low\ Trading = 1|W)}{(1 - P_j(Low\ Trading = 1|W))}} \leq \Gamma \qquad (19)$$

when $\Gamma = 1$, the assignment of an acquirer with low market attention between the two matched deals is equivalent to a random assignment. As the value of Γ increases, this assignment no longer remains a random procedure. As shown by Rosenbaum (2002), the fraction of odds can be written as:

$$\frac{\frac{P_i(Low\ Trading = 1|W)}{1 - P_i(Low\ Trading = 1|W)}}{\frac{P_j(Low\ Trading = 1|W)}{(1 - P_j(Low\ Trading = 1|W))}} = \frac{exp(k(W) + \gamma u_i)}{exp(k(W) + \gamma u_j)} = exp\{\gamma(u_i - u_j\} \qquad (20)$$

where $k(W)$ represents the impact of the observed covariates which cancel out. u_i and u_j are the unobserved covariates influencing the presence of the treatment for units i and j respectively. γ represents the influence of these covariates on the choice of treatment. Normalizing $u = u_i - u_j$ between 0 and 1, Γ can be written as $\Gamma = e^{\gamma}$and a straightforward interpretation is that the matched units may differ in their odds of receiving the treatment by at most Γ (Rosenbaum, 2002).

Panel B (Table 6) reports the outcome of the sensitivity analysis. Specifically, a missing covariate should increase the relative odds that a stock-paying acquirer is subject to low investor attention by 47% for the treatment effect to cease to be significant at the 5% level, and by 59% for this treatment effect to

cease to be significant at the 10% level. These results suggest that our empirical conclusion is relatively insensitive to the effect of a missing covariate, especially when compared to other studies that relied on the Rosenbaum (2002) analysis in the empirical finance literature. For instance, Peel and Makepeace (2012) report a Γ level of 1.55 to highlight the robustness of their conclusion regarding the premium received by accounting auditors. Likewise, Barbopoulos and Adra (2016) report a Γ level of 1.50 to highlight the robustness of their conclusion with respect to the initial payments in earnout financed deals.

7. Analysis of the Long-Run Returns

Next, we focus on the acquirer's long-run abnormal returns and attempt to investigate how they vary with the level of acquirer's overvaluation, the payment method employed in the deal, and the degree of investor attention that is received by the acquiring firm in the period preceding the deal's announcement. If the market's initial negative assessment of stock-financed deals by highly scrutinized acquirers is complete, we do not expect these acquirers to experience post-acquisition losses.

To further emphasize the role of the interaction between the acquirer's overvaluation, the payment method, and the degree of investor attention, Models (1) and (2) have the following specification:

$$\begin{aligned} Acquirer\ BHAR_{i\tau} &= \alpha_1 + \alpha_2 Stock_i + \alpha_3 (Stock_i \times Overvalued\ Acquirer_i) + \alpha_4 (Stock_i \\ &\times Overvalued\ Acquirer_i \times Low\ Trading_i) + \sum_{j=1}^{k} \beta_j X_{ij} + \varepsilon_{i\tau} \end{aligned} \quad (21)$$

where $\alpha_1 + \alpha_2 + \alpha_3$ is the average BHAR of overvalued acquirers that are exposed to high investor attention across stock-financed acquisitions. In turn, $\alpha_1 + \alpha_2 + \alpha_3 + \alpha_4$ is the average BHAR of overvalued acquirers in stock-financed deals which are subject to low investor attention. Therefore, the sign and magnitude of α_4 highlight the impact of low acquirer investor attention on the post-acquisition value gains from stock-financed deals announced by overvalued acquirers. The dependent variable in Model (1) is the 12-month ($\tau = 12$) acquirer BHAR while the dependent variable in Model (2) is the 24-month ($\tau = 24$) BHAR.

We test the restriction $\alpha_1 + \alpha_2 + \alpha_3 = 0$ using the Wald test in both Models (1) and (2). The resulting p-values of the Wald test are 0.78 and 0.45 respectively, which suggests that the post-acquisition BHAR of stock-financed acquisitions by overvalued acquirers subject to high investor attention is economically insignificant. Hence, the initial negative reaction to stock-financed acquisitions by overvalued acquirers subject to high investor scrutiny captures the full wealth effect of the M&A. Interestingly, in both models, we find that α_4, i.e. the coefficient of (Stock × Overvalued Acquirer × Low

Trading) is negative and statistically significant, highlighting 15 and 39 respective percentage point post-acquisition wealth losses for overvalued stock paying acquirers subject to low investor attention.

(Insert Table 7 about here)

To further support the notion that the initial less adverse market response to stock-financed acquisitions that are announced by acquirers subject to low investor attention is not due to high post-acquisition synergies, we analyse the acquirer's post-acquisition performance as in Heron and Lie (2002). We re-estimate Equation (21) with the dependent variables being the acquirer's post-acquisition return on assets (RoA) for the 12- and 24-month horizons.[8] If the initial less adverse response is due to high synergies, then after controlling for the acquirer's pre-acquisition RoA and various deal- and firm-related factors, we should observe that the acquirers in stock-financed deals by overvalued acquirers subject to low investor attention should experience increases in their post-acquisition RoA. The lack of positive and significant post-acquisition improvement in the overvalued stock paying acquirers' performance in Models (3) and (4) suggests that the less adverse market reaction to these acquirers is not driven by high expected post-acquisition synergies. Put together, the evidence from the initial market response and the acquirers' post-acquisition abnormal returns and performance support our prediction regarding the role of low market attention in encouraging overvalued firms to pursue stock financed non-synergy-driven acquisitions.[9]

8. Robustness Checks

8.1. An alternative investor attention proxy

We further examine whether our findings related to the short- and long-run valuation effects of investor attention hold with an alternative proxy. Accordingly, we re-estimate our multivariate models using the high Roll (1988) R^2 as a proxy for low investor attention. More specifically, the R^2 refers to the explanatory power of the regression:

$$R_{i,t} = \alpha_1 + \alpha_2 R_{MKT,t} + \alpha_3 R_{Sector,t} + \varepsilon_{i,t} \quad (22)$$

[8] We thank the anonymous reviewer for suggesting this alternative interpretation.

[9] An anonymous reviewer recommended that we apply the robust methodology proposed by Bessembinder and Zhang (2013) which, in the context of our analysis, consists of examining the variations in the monthly difference between the logarithm of acquirers' returns in stock-financed deals announced by overvalued acquirers subject to low investor attention and comparable stock-financed deals announced by acquirers subject to high investor attention. This analysis consists of using as independent variables the differences in the firm's betas, size, market-to-book valuations, idiosyncratic risk and momentum of returns, among others. Our analysis based on 18 size and market-to-book value matches suggests that, in the 24 months horizon, the overvalued acquirers subject to low investor attention end up realizing 71% of the wealth realized by the overvalued acquirers subject to high market attention. This evidence suggests, as predicted, a post-acquisition correction in the valuation of the overvalued acquirers subject to low market attention. This relative wealth difference is significant at the 10% level. These results are available from the authors upon request.

where the firm's returns $R_{i,t}$ are regressed on both the market $R_{MKT,t}$ and sector returns $R_{Sector,t}$ in the window from 240 to 10 days before the day of the acquisition announcement (t). The assumption supporting this approach is that the higher the correlation between the firm's stock returns with the market and sector returns, the less likely it is that the prevailing stock price reflects new information collected by investors. The high Roll R^2 has been used as proxy for low investor attention (i.e. low price informativeness) in previous studies such as Chen et al. (2007) and Bakke and Whited (2010).

8.2. Multivariate evidence

In Table 8 we present two regressions with the same specifications of Model (5) reported in Table 5 and Model (2) reported in Table 7 with the only difference being that the proxy of low investor attention is the dummy variable 'High Roll R^2' that is assigned the value of 1 if the acquirer's Roll R^2 exceeds its 20th percentile, and 0 otherwise. The results hold if the 25th and 30th percentiles are used instead. Interestingly, more than 70% of the acquirers classified as subject to low investor attention are also classified as acquirers subject to high Roll R^2.

(Insert Table 8 about here)

The results of both models are qualitatively similar to the ones reported in Sections 5 and 7. The evidence reported in Model (1) (Table 8) suggests that the overvalued stock-paying acquirers subject to high investor attention (i.e., low Roll R^2) experience a significant reduction in their announcement period CAR (8 percentage points). Nevertheless, this initial wealth effect is neutralized in the group of deals announced by overvalued stock-paying acquirers subject to low investor attention (i.e., high Roll R^2).[10] Model (2), which analyses the acquirer's BHAR in the 24 months following the M&A also supports the notion that the overvalued stock-paying acquirers subject to limited investor attention experience a significant post-acquisitions correction in their valuations. More specifically, these acquirers experience 38% decline in their post-announcement BHAR compared to the overvalued stock-paying acquirers which are subject to high investor attention. Overall, our analysis of the wealth effects of M&As using the Roll R^2 as an alternative investor attention proxy provides the same qualitative conclusions as the analysis based on the acquirer's pre-acquisition trading activity.[11]

[10] The matching-based results using the high Roll R^2 as a proxy for low investor attention are available from the authors upon request.

[11] In untabulated results, we have re-estimated the Logit model from Table 4 with the High values of Roll R^2 as a proxy for low market attention. Our results, which are available from the authors upon request, suggest that overvalued acquirers are more likely to engage in stock-financed acquisitions relative undervalued acquirers (as classified within the low Roll R^2). This difference is significant at the 10% level.

9. Conclusion

A stylized finding in the corporate finance and M&A literature is that the acquirers using their own shares as the payment method in their takeovers involving listed-target firms tend to experience substantial reductions in their existing valuations. Such wealth losses are attributed to the stock market investors' interpretation of the use of stock-financing as a signal that the acquiring firms' shares are overvalued, which triggers an immediate correction in acquirers' stock valuation. Our results, which are robust to various model specifications and measures of investor attention, suggest that the acquirers whose stock prices are subject to low investor attention engage in overvaluation-driven stock-financed acquisitions without experiencing immediate shareholder wealth losses. The PSM analysis, which is accompanied with the Rosenbaum (2002) sensitivity analysis, further validates these results.

Moreover, our analysis of the acquirer's long-run abnormal returns suggests that the overvaluation of stock paying acquirers that receive limited investor attention is only corrected in the years following the acquisition announcement. Overall, our results highlight the role of investor attention as a moderator in the relationship between the payment method and the acquirer's announcement period and post-announcement acquirer abnormal returns. These results also contribute to the literature suggesting that corporate managers aim to exploit the limited investor attention in timing their announcements (DeHaan et al., 2015; Michaely et al., 2016).

Appendix 1: Variables' definitions

Variable	Description	Source
Acquirer CAR (%)	The acquirer's 5-day (-2, 2) announcement periods cumulative abnormal returns. The abnormal return in each day is the difference between the firm's returns and the value-weighted returns of NYSE firms.	Datastream + Authors' Estimations
Acquirer $BHAR_{12}$ (%)	The acquirer's buy-and-hold returns for the period of 12 months following the completion of the acquisition.	Datastream + Authors' Estimations
Acquirer $BHAR_{24}$ (%)	The acquirer's buy-and-hold returns for the period of 24 months following the completion of the acquisition.	Datastream + Authors' Estimations
Acquirer Closely Held Shares (%)	The percentage of the target's shares that are closely held by a small group of family or institutional investors.	Datastream
Acquirer High Closely Held Shares (%)	Dummy =1 if Acquirer Closely Held Share>10%, 0 otherwise.	Datastream
Acquirer Debt-to-Assets	The acquirer's ratio of Debt-to-Assets 43 days prior to the bid announcement.	Datastream
Acquirer Market Value (m$)	The acquirer's market value of equity 43 days prior to bid announcement, in millions of dollars.	Datastream
Acquirer Market to Book Value	The market value of the acquirer 43 days before the acquisition, divided by its book value of equity from the most recent accounting statement prior to the bid announcement.	Datastream
Acquirer Market to Book Value	The market value of the target 43 days before the acquisition, divided by its book value of equity from the most recent accounting statement prior to the bid announcement.	Datastream
Acquirer Standard Deviation (%)	The standard deviation of the acquirer's daily abnormal returns for the 240 to 43 days that precede the bid announcement.	Datastream
Presence of Acquirer Toehold	Dummy=1 if the acquirer already owns target shares (i.e. Acquirer Toehold>0), 0 otherwise.	SDC
Cash	Dummy=1 if the consideration is 100% financed with cash and 0 otherwise.	SDC
Diversifying	Dummy=1 if the acquirer and the target have different two-digit SIC codes, and 0 otherwise (FCSD).	SDC
Stock	Dummy = 1 when the consideration is 100% financed with stocks and 0 otherwise.	SDC
Target Market Value (m$)	Target's market value of equity 43 days prior to bid announcement, in millions of dollars.	Datastream
Target Standard Deviation (%)	The standard deviation of the target's daily abnormal returns for the 240 to 43 days that precede the bid announcement.	Datastream
Propensity Score	The propensity scores estimated via the Logit model to predict the presence of an acquirer with a low level of pre-acquisition trading in a stock financed deal.	Authors' Estimations
Low Trading	In the regression analysis, Dummy=1 if the acquirer's daily percentage of traded shares relative to listed shares exceeds the 70^{th} percentile of the corresponding sample in the period of 43 to 10 days preceding the acquisition, 0 otherwise (High Trading). In the matching analysis, this variable is defined as Dummy=1 if the acquirer's daily percentage of traded shares relative to listed shares exceeds the 50^{th} percentile of the corresponding sample in the period of 43 to 10 days preceding the acquisition, 0 otherwise (High Trading).	Datastream + Authors' Estimations
Percentage of Acquirer Traded Shares (%)	The acquirer's daily percentage of traded shares relative to listed shares in the period of 43 to 10 days preceding the acquisition.	Datastream
Acquirer Overvaluation	The acquiring firm-specific overvaluation estimated based on the Rhodes–Kropf et al. (2005) method of decomposing the market-to-book value.	Datastream + Authors' Estimations
Overvalued Acquirer	Dummy =1 if Acquirer Overvaluation >0, and 0 otherwise.	Datastream

Continued

Continued (Appendix 1)

Variable	Description	Source
Acquirer Roll R^2	The R^2 from the regression of the acquirer's returns on both the market and sector returns. The latter returns are defined by Datastream as the local sector returns.	Datastream + Authors' Estimations
Acquirer High Roll R^2	Dummy=1, if the Roll R^2 exceeds its 20th percentile, 0 otherwise.	Datastream + Authors' Estimations
Acquirer RoA (%)	The acquirer's return on assets in the year preceding the acquisition announcement.	Datastream
Acquirer RoA_{12} (%)	The acquirer's return on assets in the calendar year following the acquisition announcement.	Datastream
Acquirer RoA_{24} (%)	The acquirer's return on assets in the second calendar year following the acquisition announcement.	Datastream
Friday	Dummy =1 if the deal is announced on a Friday, 0 otherwise.	SDC
Industrials	A macro-industry that includes the following mid-industries: Aerospace & Defense, Automobiles & Components, Building/Construction & Engineering, Industrial Conglomerates, Machinery, Transportation & Infrastructure and other industrials.	SDC
Healthcare	A macro-industry that includes the following mid-industries: Biotechnology, Healthcare Equipment & Supplies, Providers & Services (HMOs), Hospitals, Pharmaceuticals, and Other Healthcare.	SDC
Consumer Staples	A macro-industry that includes the following mid-industries: Agriculture & Livestock, Food and Beverage, Household & Personal Products, Textiles & Apparel, Tobacco, and Other Consumer Staples.	SDC
Materials	A macro-industry that includes the following mid-industries: Chemicals Construction Materials, Containers & Packaging, Metals & Mining Paper & Forest Products, and Other Materials.	SDC
Media and Entertainment	A macro-industry that includes the following mid-industries: Advertising & Marketing, Broadcasting, Cable, Casinos & Gaming, Hotels and Lodging, and Motion Pictures / Audio Visual.	SDC
Retail	A macro-industry that includes the following mid-industries: Apparel Retailing, Automotive Retailing, Computers & Electronics Retailing Discount and Department Store Retailing, Food & Beverage Retailing, Home Improvement Retailing, Internet and Catalog Retailing, and Other Retailing.	SDC
Consumer Products and Services	A macro-industry that includes the following mid-industries: Educational Services, Employment Services, Home Furnishings, Legal Services, Professional Services, Travel Services, and Other Consumer Products.	SDC
High Technology	A macro-industry that includes the following mid-industries: Computers & Peripherals, E-commerce / B2B, Electronics, Hardware, Internet Infrastructure, Internet Software & Services, Semi-Conductors, and Software.	SDC
Energy and Power	A macro-industry that includes the following mid-industries: Alternative Energy Sources, Oil & Gas, Petrochemicals, Pipelines, Power, Water and Waste Management, and Other Energy and Power.	SDC
Telecommunications	A macro-industry that includes the following mid-industries: Space and Satellites, Telecommunications Equipment, Telecommunications Services, Wireless, and Other Telecom.	SDC
Financials	A macro-industry that includes the following mid-industries: Asset Management, Banks, Brokerage, Credit Institutions, Diversified Financials, Government Sponsored Enterprises, Insurance, and Other Financials.	SDC
Real Estate	A macro-industry that includes the following mid-industries: Non Residential, Real Estate Management & Development, Residential, and Other Real Estate.	SDC

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Table 1: Annual distribution of the sampled deals

	Panel A					Panel B											
Year	All	Cash	Stock	Focused	Diversifying	IND	HCR	CST	MAT	MED	RTL	CPS	HT	EPW	TLC	FIN	RST
2002	21	15	6	14	7	0	7	1	1	1	0	1	6	0	0	4	0
2003	21	13	8	11	10	1	3	0	0	1	0	1	3	1	2	8	1
2004	30	16	14	21	9	0	8	0	0	0	0	2	8	2	0	10	0
2005	30	19	11	13	17	1	9	0	1	0	0	2	10	0	1	6	0
2006	50	35	15	26	24	0	6	1	2	3	1	1	22	1	2	9	2
2007	68	53	15	39	29	4	12	1	3	5	2	4	19	0	4	13	1
2008	38	28	10	25	13	2	7	0	0	0	2	0	16	2	1	8	0
2009	38	17	21	25	13	1	5	3	1	0	0	2	13	5	2	5	1
2010	57	45	12	39	18	5	9	1	1	0	0	2	25	2	2	10	0
2011	37	23	14	28	9	3	6		5	0	0	0	3	4	3	9	4
2012	34	22	12	22	12	2	3	1	0	0	1	3	7	2	3	12	0
2013	45	27	18	36	9	2	6	2	0	1	2	3	7	4	1	15	2
2014	44	25	19	30	14	1	8	3	3	3	1	3	6	3	3	8	2
N	513	338	175	329	184	22	89	13	17	14	9	24	145	26	24	117	13
%	100	65.89	34.11	64.13	35.87	4.29	17.35	2.53	3.31	2.73	1.75	4.68	28.27	5.07	4.68	22.81	2.53

Note: Panel A represents the annual distribution of public-to-public M&A bids announced by U.S acquirers between January 1st, 2002 and December 31st, 2014. The distribution of the sample is presented according to the total number of transactions, method of payment (Cash or Stock), and whether the acquisition is industry-focused or diversifying. Panel B represents the yearly distribution of the M&A bids with respect to the target's sector. The sectors, as reported by SDC, are: Industrials (IND), Healthcare (HCR), Consumer Staples (CST), Materials (MAT), Media and Entertainment (MED), Retail (RTL), Consumer Products (CPS), High-Technology (HT), Energy and Power (EPW), Telecommunications (TLC), Financials (FIN) and Real Estate (RST). *N* is the number of deals in each category and (%) is the percentage of deals in this category relative to the total number of deals (513). Appendix 1 provides a detailed description of these sectors.

Table 2: Descriptive statistics

Variable	*N*	Mean	Median	Max	Min	SD
Acquirer CAR (%)	513	0.23	0.037	70.54	-30.57	7.84
Acquirer $BHAR_{12}$ (%)	393	-6.33	-6.10	124.00	-102.00	33.99
Acquirer $BHAR_{24}$ (%)	393	-9.19	-9.92	134.05	-123.00	41.67
Target Market Value (m$)	513	1074.49	231.09	53535.09	2.38	3761.39
Acquirer Toehold (%)	513	2.56	0.00	88.00	0.00	11.96
Acquirer Market Value (m$)	513	26893.63	3966.59	525775.70	3.69	52412.71
Acquirer Market to Book Value	513	3.01	1.89	26.00	0.27	3.66
Target Market to Book Value	513	2.83	2.23	13.04	0.31	2.21
Acquirer Closely Held Shares (%)	513	26.12	0.00	100	0.00	0.44
Target Standard Deviation (%)	513	3.30	2.76	22.01	0.00	2.24
Acquirer Standard Deviation (%)	513	2.24	1.79	23.47	0.64	1.74
Acquirer Debt-to-Assets (%)	513	20.76	18.69	78.80	0.00	16.09
Acquirer Overvaluation	513	-0.03	-0.05	1.17	-1.14	0.65
Percentage of Acquirer Traded Shares (%)	513	0.97	0.63	14.74	0.00	1.38
Acquirer Roll R^2	513	0.30	0.30	0.76	0.01	0.18
Acquirer ROA (%)	513	4.16	5.01	77.50	-100	12.17
Acquirer ROA_{12} (%)	393	3.23	4.00	61.75	-98.54	12.56
Acquirer ROA_{24} (%)	393	7.13	9.67	102.08	-99.04	26.87

Note: This table represents descriptive statistics for the continuous covariates in the sample. For each variable, the number of available observations, mean, median, maximum, minimum and standard deviation values are reported. The market-to-book values, acquirer overvaluation, and BHAR variables are winsorized at the 1st and 99th percentiles. In estimating the post-acquisition BHAR and RoA, deals by acquirers who made more than other acquisitions during the month before the acquisition, the month of the acquisition, and the month after the acquisition are excluded to ensure that the long-term effects are not conflated. Please refer to Appendix 1 for an accurate description of the variables.

Table 3: Univariate results

	Deal Groups	Acquirer CAR	Acquirer $BHAR_{12}$	Acquirer $BHAR_{24}$
(a)	Stock Financed Deals (Stock=1)	-0.54 (*N*=175)	-8.27*** (*N*=143)	-10.60*** (*N*=143)
(b)	Cash Financed Deals (Cash=1)	0.64** (*N*=338)	-5.22*** (*N*=250)	-8.38*** (*N*=250)
(c)	(a)-(b)	-1.18*	-3.05	-2.22
(d)	Stock-financed deals with low trading of the acquirer's Shares (Stock=1 and Low Trading=1)	0.09 (*N*=135)	-8.50*** (*N*=114)	-12.66*** (*N*=114)
(e)	Stock-financed deals with high trading of the acquirer's shares (Stock=1, Low Trading=0)	-3.19** (*N*=40)	-7.40 (*N*=29)	-0.2.49(*N*=29)
(f)	(d)-(e) (d)-(b) (e)-(b)	3.28** -0.55 -3.18**	-1.10 -3.28 -2.18	-10.17 -4.28 5.89

Note: This table reports the univariate analysis of the acquirer's announcement periods CAR in addition to the 12- and 24-month Buy-and-Hold Returns (BHAR) across various groups of deals based on the method of payment used and the degree of the acquirer's market attention. The extent of market attention is estimated based on the level of daily trading volume relative to listed shares in the period of 43 to 10 days before the deal's announcement. In each sample, a firm is considered subject to high (low) market attention if the level of its share turnover is above (below) the 70^{th} percentile in the original sample. The univariate analysis is reported for the overall groups of stock and cash financed deals, stock financed deals with acquirers subject to high and low market pre-acquisition trading in addition to cash financed deals. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 4: Predicting the choice of the payment method

Dependent Variable	Stock = 1 Cash = 0	Stock = 1 Cash = 0
Explanatory Variable\Model (.)	(1)	(2)
Intercept	1.666**	2.3105***
	(0.691)	(0.777)
Overvalued Acquirer	-0.270	-0.232
	(0.403)	(0.434)
Overvalued Acquirer × Low Trading	0.951**	0.882**
	(0.412)	(0.439)
Percentage of Acquirer Traded Shares	-0.007	-0.004
	(0.105)	(0.103)
Acquirer Market to Book Value	-0.048	-0.054
	(0.039)	(0.041)
Target Market to Book Value	-0.118*	-0.100
	(0.069)	(0.072)
Diversifying	-0.572**	-0.634**
	(0.254)	(0.274)
ln(Target Market Value)	0.582***	0.617***
	(0.108)	(0.116)
ln(Acquirer Market Value)	-0.635***	-0.714***
	(0.100)	(0.111)
Presence of Acquirer Toehold	0.825*	0.133
	(0.494)	(0.544)
Acquirer High Closely Held Shares	-0.749***	-0.931***
	(0.280)	(0.309)
Target Standard Deviation	0.006	0.026
	(0.083)	(0.087)
Acquirer Standard Deviation	0.166	0.177
	(0.127)	(0.141)
Acquirer Debt-to-Assets	-0.009	-0.012
	(0.007)	(0.008)
Friday	0.350	0.476
	(0.303)	(0.320)
Acquirer RoA	-0.0404***	-0.039***
	(0.013)	(0.015)
Year Effects	NO	YES
Industry Effects	NO	YES
N	513	513
Mc-Fadden R-Squared	0.27	0.32

Note: This table presents the outcome of two Logit models that predict the listing status of the acquiring firm based on target-specific and market-related factors. Model (1) excludes year and industry effects while Model (2) controls for these effects. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 5: Multivariate analysis of the acquirers' CAR

Dependent Variable	Acquirer CAR	Acquirer CAR	Acquirer CAR	Acquirer CAR	Acquirer CAR
Explanatory Variable\Model (.)	(1)	(2)	(3)	(4)	(5)
Intercept	0.379	1.281**	-0.337	-2.116	0.119
	(0.478)	(0.624)	(3.131)	(1.511)	(3.151)
Stock	-4.413***	-4.510***	-6.002***	-1.206	-1.679
	(1.684)	(1.653)	(1.842)	(1.447)	(1.227)
Stock × Low Trading	4.168**	4.076**	4.550**		
	(1.881)	(1.838)	(1.938)		
Stock × Overvalued Acquirer				-6.169**	-6.420**
				(2.771)	(2.876)
Stock × Overvalued Acquirer × Low Trading				5.603**	6.073**
				(2.533)	(2.689)
Percentage of Acquirer Traded Shares	0.249	0.281	0.269	0.274	0.244
	(0.312)	(0.320)	(0.300)	(0.296)	(0.329)
Overvalued Acquirer		-1.819**	-0.257	-0.810	0.267
		(0.639)	(0.691)	(0.677)	(0.787)
Acquirer Market to Book Value			-0.083		-0.078
			(0.117)		(0.117)
Target Market to Book Value			-0.218*		-0.207*
			(0.130)		(0.127)
Diversifying			-0.481		-0.436
			(0.663)		(0.677)
ln(Target Market Value)			-0.050		-0.040
			(0.300)		(0.295)
ln(Acquirer Market Value)			-0.303		-0.361
			(0.290)		(0.290)
Presence of Acquirer Toehold			-0.661		-0.348
			(1.691)		(1.686)
Acquirer High Closely Held Shares			-0.182		-0.269
			(0.944)		(0.948)
Target Standard Deviation			-0.265		-0.286
			(0.273)		(0.270)
Acquirer Standard Deviation			1.136***		1.109***
			(0.454)		(0.441)
Acquirer Debt-to-Assets			0.033		0.034
			(0.028)		(0.028)
Friday			-0.692		-0.769
			(0.824)		(0.804)
Acquirer ROA			0.104		0.102
			(0.068)		(0.070)
Year Effects	NO	NO	YES	YES	YES
Industry Effects	NO	NO	YES	YES	YES
N	513	513	513	513	513
Adjusted R-Squared	0.02	0.02	0.10	0.06	0.10

Note: This table reports the results of the cross-sectional analysis explaining the 5-day announcement period acquirer CAR. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 6: PSM results

Panel A: Logit model					
Intercept	Overvalued Acquirer	Acquirer Standard Deviation	Target Standard Deviation	ln(Target Market Value)	ln(Acquirer Market Value)
4.095***	0.902**	0.003	-0.140	-0.385**	-0.191
(1.043)	(0.437)	(0.100)	(0.099)	(0.159)	(0.154)

Panel B: Matching outcome	
Matching Algorithm	Caliper Matching
Caliper	0.1
Matched Observations per Treated Deal	4:1
Number of Treated Observations	24
Number of Control Observations with Replacement	96
ATT (%) (Abadie and Imbens (2006)	3.526***
Standard Errors)	(0.647)
Cut-off Γ value (p≈0.05)	1.47
Cut-off Γ value (p≈0.10)	1.59

Panel C: Regression diagnostics	
Dependent Variable	Acquirer CAR
Intercept	1.128
	(12.456)
Overvalued Acquirer	-11.509**
	(5.527)
Overvalued Acquirer × Low Trading	12.369***
	(4.620)

Panel D: **Covariates' balancing**						
	Before Matching			After Matching		
	Treatment Group	Control Group	*p*-value	Treatment Group	Control Group	*p*-value
Propensity Score	0.66	0.51	0.00	0.66	0.66	0.16
ln(Acquirer Market Value)	6.85	7.95	0.00	7.64	7.90	0.62
ln(Target Market Value)	5.15	6.55	0.00	6.71	6.51	0.57
Acquirer Market to Book Value	2.60	3.44	0.32	2.27	3.47	0.13
Target Market to Book Value	1.84	2.85	0.03	1.95	2.68	0.10
Diversifying	0.25	0.17	0.27	0.29	0.18	0.25
Acquirer Standard Deviation	2.85	3.04	0.59	2.93	3.08	0.71
Target Standard Deviation	3.38	3.71	0.36	3.21	3.73	0.45
Acquirer Debt-to-Assets	20.38	18.37	0.49	20.50	18.85	0.68
Acquirer High Closely Held Shares	0.27	0.26	0.90	0.29	0.26	0.76
Presence of Acquirer Toehold	0.10	0.03	0.06	0.09	0.03	0.18
Acquirer Overvaluation	-0.20	0.06	0.14	-0.05	-0.08	0.46

Note: This table reports the outcome of the Propensity Score Matching analysis that estimates the wealth effect of the presence of an acquirer whose shares are subject to low trading activity on the sample of stock financed acquisitions. The outcome variable is the acquirer's announcement period CAR. The treatment variable (Low Trading) is the presence of an acquirer whose percentage of daily traded to listed shares is below the 50th percentile in the sample. The propensity scores are estimated via a Logit model where the dependent variable is Low Trading. Variables are included in this Logit model provided that such an inclusion improves the balance of the key covariates in the matched sample. Panel A reports the Logit model used to estimate the propensity scores. Panel B reports the outcome of the matching analysis. More specifically, this panel reports the caliper used in the matching, the ratio of matched observations to each treated observation, the number of treated and control observations in the matched sample, the estimated *ATT* with the Abadie and Imbens (2006) standard errors and the cut-off Γ value at the 5% and 10% level of significance. These outcomes are reported based on the Caliper Matching algorithm with a caliper of 0.1. Four untreated deals (i.e., High Trading) are matched to each treated deal (i.e., Low Trading) while allowing each untreated deal to be used as a match more than once. Overall, 36 observations are dropped from the analysis in the matched sample. Panel C presents the outcome of the regression analysis on the matched sample. Panel D represents the effect of the matching exercise's effect on balancing the propensity scores and the key empirical variables. The mean value of each of these variables in the treated group and the control group and the bootstrapped *p*-value from the *t*-test of the null hypothesis that the difference is statistically equal to 0 are reported before and after the matching. ***,**, and * represent significance at the 1%, 5% and the 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 7: Multivariate analysis of the acquirers' post-acquisition performance

Dependent Variable	$BHAR_{12}$	$BHAR_{24}$	Acquirer RoA_{12}	Acquirer RoA_{24}
Explanatory Variable\Model (.)	(1)	(2)	(3)	(4)
Intercept	-11.150	-15.502	5.975	4.389
	(12.660)	(14.427)	(4.779)	(8.147)
Stock	-9.257	-6.959	-0.429	1.610
	(5.805)	(6.822)	(1.252)	(3.350)
Stock × Overvalued Acquirer	19.806**	34.788***	-4.240	-0.781
	(9.241)	(11.467)	(6.059)	(9.338)
Stock × Overvalued Acquirer × Low Trading	-15.099*	-28.909***	0.934	-2.789
	(8.551)	(11.018)	(6.784)	(9.938)
Percentage of Acquirer Traded Shares	-1.389	-1.690	0.981**	1.194
	(0.945)	(1.227)	(0.509)	(0.899)
Overvalued Acquirer	-1.563	-2.376	0.338	1.4690
	(4.801)	(5.579)	(1.340)	(3.033)
Acquirer Market to Book Value	-0.337	0.375	0.144	-0.477
	(0.378)	(0.543)	(0.321)	(0.570)
Target Market to Book Value	-1.737***	-1.709**	0.551**	3.711
	(0.632)	(0.716)	(0.283)	(0.689)
Diversifying	-1.009	1.299	0.506	0.341
	(3.803)	(4.388)	(1.239)	(2.600)
ln(Target Market Value)	0.228	-0.419	-0.633	-2.520***
	(1.540)	(1.831)	(0.422)	(0.960)
ln(Acquirer Market Value)	0.186	0.957	0.590	2.087**
	(1.202)	(1.379)	(0.448)	(0.918)
Presence of Acquirer Toehold	4.564	5.509	0.259*	0.374
	(7.151)	(8.619)	(0.154)	(0.232)
Acquirer High Closely Held Shares	-4.134	-0.935	-1.229	-1.594
	(4.850)	(5.713)	(1.325)	(2.893)
Target Standard Deviation	1.118	0.461	-0.282	-1.511**
	(0.939)	(1.087)	(0.538)	(0.654)
Acquirer Standard Deviation	-0.043	1.021	-2.844***	-4.488***
	(0.872)	(0.964)	(0.912)	(1.194)
Acquirer Debt-to-Assets	-0.084	-0.008	0.031	0.080
	(0.115)	(0.147)	(0.043)	(1.123)
Friday	5.378	2.507	0.004	-0.778
	(4.502)	(5.027)	(1.472)	(3.681)
Acquirer ROA	-0.088	0.072	0.259*	0.374
	(0.204)	(0.203)	(0.154)	(0.232)
Year Effects	YES	YES	YES	YES
Industry Effects	YES	YES	YES	YES
N	393	393	393	393
Adjusted R-Squared	0.08	0.01	0.36	0.36

Note: This table reports the results of the cross-sectional analysis explaining the variation in the acquirer's post-acquisition buy-and-hold abnormal returns (BHAR) and post-acquisition Returns on Assets. The dependent variable in Model (1) is the 12-month BHAR. In turn, the dependent variable in Model (1) is the 24-month BHAR. The dependent variables in Models (3) and (4) are the acquirer's returns on assets during the 12 and 24 months after the acquisition, respectively. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. *N* indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.

Table 8: Multivariate analysis of the acquirer's short- and long-run returns using Roll's R^2 as a measure of low market scrutiny

Dependent Variable	Acquirer CAR	$BHAR_{24}$
Explanatory Variable\Model (.)	(1)	(2)
Intercept	1.285	-3.207
	(2.831)	(16.940)
Stock	-2.081	-6.113
	(1.354)	(7.665)
Stock × Overvalued Acquirer	-7.242***	44.816***
	(2.947)	(17.199)
Stock × Overvalued Acquirer × Acquirer High Roll R^2	6.204**	-37.660**
	(2.745)	(17.292)
Acquirer Roll R^2	-5.632**	14.483
	(2.433)	(16.060)
Overvalued Acquirer	-0.018	-2.960
	(0.798)	(6.050)
Acquirer Market to Book Value	-0.057	0.186
	(0.124)	(0.558)
Target Market to Book Value	-0.193	-1.705**
	(0.129)	(0.746)
Diversifying	-0.133	0.948
	(0.701)	(4.812)
ln(Target Market Value)	-0.053	-0.308
	(0.306)	(1.809)
ln(Acquirer Market Value)	-0.174	0.0323
	(0.298)	(1.667)
Presence of Acquirer Toehold	-0.907	10.292
	(1.701)	(9.582)
Acquirer High Closely Held Shares	-0.310	-1.994
	(0.921)	(5.522)
Target Standard Deviation	-0.262	-0.232
	(0.264)	(1.230)
Acquirer Standard Deviation	1.096***	0.289
	(0.432)	(1.223)
Acquirer Debt-to-Assets	0.042	-0.143
	(0.029)	(0.154)
Friday	-0.726	1.400
	(0.820)	(4.917)
Acquirer ROA	0.102	-0.028
	(0.066)	(0.238)
Year Effects	YES	YES
Industry Effects	YES	YES
N	513	393
Adjusted R-Squared	0.10	0.02

Note: This table reports the results of the cross-sectional analysis explaining the 5-day announcement period acquirer CAR (Model 1) and 24-month BHAR (Model 2) with the high acquirer Roll R^2 used as a proxy of low market scrutiny. The standard errors reported in parentheses are corrected for heteroskedasticity using the White (1980) heteroskedasticity consistent standard errors. N indicates the number of observations. ***, **, and * represent significance at the 1%, 5% and 10% levels respectively. Please refer to Appendix 1 for an accurate description of the variables.