Do Stock-Financed Acquisitions Destroy Value? New Methods and Evidence*

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Abstract. We contribute to the debate on whether stock-financed acquisitions destroy value for shareholders. A stock-financed acquisition is a joint takeover/equity-issue event. Using SEO announcement returns, we estimate through linear prediction and propensity-score matching the share price drop that stock acquirers experience due to the financing choice. Net of this effect, stock-financed acquisitions are not value destructive, and the method of payment generally has no further explanatory power in the cross-section of acquirer returns. Our evidence is largely inconsistent with the agency costs of overvalued equity hypothesis.

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1. Introduction

Do stock mergers destroy value for shareholders? The extant empirical evidence is that stock-financed public firm acquisitions are associated with negative shareholder wealth effects at the announcement, while cash-financed deals are associated with normal or even small positive announcement effects (e.g. Travlos (1987)).[1] The standard interpretation of this result is the adverse selection associated with public issues of equity, whereby firms sell stock when it is overvalued (Myers and Majluf (1984); see also Baker and Wurgler (2002) for a related market timing argument). What is not known, however, is whether the information effects of the financing choice account for *all* or only *part* of the difference in the returns to cash and stock acquisitions.

Relevant to this question is an argument offered by Jensen (2005) which has become known as the "agency costs of overvalued equity" hypothesis. Specifically, the availability of "cheap" equity financing in the form of overpriced stock may erode managerial discipline and even coerce managers into making ill-conceived investments, particularly stock-financed acquisitions.[2] If this is the case, stock mergers should be, on average, inferior investment decisions. Existing evidence of lower returns to stock mergers cannot discern the information effects of the payment choice from the value consequences of the underlying investment decision and may, in fact, represent evidence of suboptimal investment predicted by the agency costs of overvalued equity hypothesis. In this paper we improve on the conventional event study techniques and develop a methodology

[1] Loughran and Vijh (1997) show that, even in the long run, stock-financed acquisitions are associated with lower abnormal stock returns than cash-financed deals.

[2] Other manifestations of agency costs of overvalued equity according to Jensen (2005) come in the form of aggressive or even fraudulent accounting, partly in order to meet analyst expectations and budget targets.

that allows for disentangling the two effects, ultimately providing new evidence on the value consequences of stock-financed acquisitions and the underlying investment decisions.[3]

In essence, a stock-financed merger announcement is a joint announcement of a takeover and an equity issue. If managers maximize shareholder wealth, the takeover should be associated with a non-negative net present value (NPV). As for the equity issue, Myers and Majluf (1984) suggest that managers – based on their private information – decide to issue new equity only when they believe it to be overvalued. The market participants are aware of this behavior and adjust the stock price downwards upon the announcement of new issues.[4]This implies that the announcement period return of stock acquirers should be thought of as consisting of two components, with only one of them reflecting the value-creation of the merger *per se*, while the other is reflecting the financing impact. Put simply, the announcement period return to a stock-financed acquisition can be written as:

[3] Non-information-based trading can also affect inferences. Mitchell et al. (2004) show that downward price pressure arising from short-selling by merger arbitrageurs (who short sell the bidder's stock at the announcement of stock-financed acquisitions to offset their long positions in the target stock) can also account for a part, but not all of the negative announcement effect. To the extent that these price pressure effects are important, our estimates of the shareholder wealth effects of stock-financed acquisitions as investment decisions are downward biased. However, a potentially offsetting effect comes from investor inertia, which makes the returns in stock-financed acquisitions less negative than would be the case in an SEO followed by a takeover. We discuss these issues in more detail in Sections 5.6 and 5.7.

[4] Alternatively, Baker and Wurgler (2002) suggest a market timing framework with irrational investors who occasionally misprice securities, and rational managers who take opportunity of overvaluation by issuing the overpriced security, thereby reducing the cost of capital. Both the adverse selection and the market timing frameworks imply overvaluation as the rationale for issuing equity, but the intuition is slightly different: in Myers and Majluf (1984) the overvaluation stems from investors not having the full information set and overpricing the stock relative to what is privately known to managers, while in Baker and Wurgler (2002) it stems from irrational investors bidding up stock prices above fundamentals on sentiment.

$$\textit{Stock Acquirer CAR} \equiv \textit{Takeover CAR} + \textit{Equity Issue CAR} \quad (1)$$

Therefore, in order to infer anything with respect to the investment decision (project selection) it is necessary to disentangle these two effects and to isolate the part of the announcement period return due to the takeover announcement *only*.[5]

Empirically, this can be done by estimating the hypothetical stock price decrease that *would have* occurred to a given stock acquirer when independently issuing public equity. Seasoned equity offerings (SEOs) represent an ideal comparable event that makes this approach feasible. Indeed, the announcement effects of stock-financed acquisitions and SEOs are similar – the literature shows that both are on the order of negative 2-3%. In addition, stock acquirers and seasoned equity issuers share similar characteristics. For instance, both stock acquirers and equity issuers experience stock price run-ups prior to the announcement. Further, these characteristics have analogous effects on the announcement returns across the two types of events. For example, announcement period returns to both stock-mergers and SEOs have been shown to be negatively related to the stock price run-up and idiosyncratic volatility. These patterns, reviewed more closely below, lend support to our approach which relies on the parallels drawn between stock-financed mergers and SEOs.

Econometrically, we implement this thinking in two different ways. Our first approach is to estimate the implied equity issuance confounding effect as a linear prediction from a cross-sectional model of SEO announcement returns. This amounts to evaluating the characteristics of a given stock acquirer using parameter-estimates from a regression run over a cross-section of

[5] Note that if the takeover announcement reveals other sets of information in addition to the two components we delineate, our approach is still valid for the purpose of our study: as long as the additional information is not systematically different across cash and stock-financed deals, any non-financing-related information will simply remain in the takeover part of the announcement return.

announcement returns in SEOs. In our second method, we draw on propensity-score matching techniques and identify the hypothetical stock issuance effect by the returns of the SEO issuers most closely resembling the stock acquirer in question.

The merit of these two approaches is that they allow for multiple dimensions (for instance, firm size, valuation, relative size of the issue and other characteristics) to be taken into account in measuring the announcement return that *would have* accrued to the shareholders of the firm upon announcement of an equity issue. The estimated value is then subtracted from the stock acquirer announcement period return to yield a "pure takeover" effect due to the takeover *only*. We test whether this net effect is, *ceteris paribus*, different from the announcement returns to cash bids. If stock-financed deals continue to exhibit lower returns once we purge the market reaction from the financing impact, this would be consistent with the agency costs of overvalued equity story. In other words, we test whether the method of payment has any further explanatory power in the cross-section of acquirer returns after the implied equity financing effects are taken into account.

We begin with a back of the envelope calculation showing that the average stock price response to cash-financed takeovers is close to the average stock price response to stock-financed deals *minus* the average stock price response to SEOs. We then implement the two approaches (linear prediction and propensity-score matching) and estimate for each stock acquirer the hypothetical stock price drop that it experiences due to the implied equity issue announcement. Subtracting it from the total stock acquirer announcement return, we obtain the remaining "pure takeover" part of the announcement return. This is, on average, not different from announcement returns to cash deals. This result continues to hold in cross-sectional regressions which control for various characteristics known to affect acquirer returns, as well as when we model the endogeneity of the method of payment decision. Taken as a whole our findings are inconsistent with the agency

costs of overvalued equity hypothesis, although we do find some limited evidence of inferior stock acquisitions during the bubble period and for cash-rich acquirers.

To the extent that the market anticipates certain value-creative or value-destructive usage of proceeds from SEOs, issuer returns and our hypothetical stock issue returns capture both financing and investment effects. Hence, an implicit assumption we need to make for our methodology to be valid is that value-creative and value-destructive motives/abilities are evenly distributed across issuing firms, such that the average investment effect is zero and our estimated counterfactuals are picking up the financing impact only. We address this issue in more detail and further establish that the results are robust to restricting the SEOs sample to i) issues conveying little-to-no information about the primary use of funds raised (general corporate purpose SEOs), and ii) pure financing events (equity-for-debt exchange offers).

Our general conclusions also hold when we extend the joint-announcement argument to *cash*-financed deals, and decomposing their announcement returns into pure takeover and implied *bond issue* parts. In addition, while we confirm that stock acquirers do experience merger arbitrage price pressure as documented by Mitchell et al. (2004), we also show that the implied equity issuance effects (adverse selection) appear to be the dominant force behind the negative announcement returns. Finally, we extend our analysis to private firm acquisitions, where we use private placements of equity (rather than SEOs) to delineate the equity issue and the takeover parts of the market reaction. Here again we find that, in all cases but one, the differences in acquirer returns between cash and stock-financed private firm acquisitions disappear.

The results of our study have important contributions to the corporate finance and mergers and acquisitions (M&A) literature. We provide the first evidence, to date, of the wealth effects of stock-financed acquisitions as *investment* decisions (i.e., net of the associated equity financing

effects). These estimates imply that stock-financed deals appear to be non-value destructive investments. Furthermore, our findings show that the method of payment generally has no further explanatory power in the cross-section of acquirer returns after the equity issue effects are taken into account. This result runs contrary to the predictions of Jensen (2005) regarding the agency costs of overvalued equity, at least with respect to stock-financed acquisitions in our overall sample. Finally, we propose methods, based on comparable events, allowing for the estimation of confounding effects in joint-type announcements, which could be applied in other contexts.

Our study is most closely related to the work of Savor and Lu (2009), Bhagat et al. (2005), Fu et al. (2013), and Ben-David et al. (2014). Savor and Lu (2009) examine value creation from the use of overvalued equity as means of financing. We, instead, focus on the investment decisions underlying acquisition financing choices (project selection). Bhagat et al. (2005) address the revelation bias in the estimation of takeover gains in *tender offers* by utilizing intervening events such as competing bids. We study *all* M&A deals and disentangle the takeover component of the announcement return to stock-financed acquisitions from the equity financing one by drawing the apparent parallel between stock-financed deals and SEOs. Fu et al. (2013) and Ben-David et al. (2014) identify stock mergers by particularly overvalued acquirers but come to different conclusions as to whether these deals hurt acquiring firm shareholders. Our evidence further contributes to this debate. More broadly, our study fits within the emerging stream of literature on the interactions between financing and investment decisions, such as studies by Baker et al. (2003), Polk and Sapienza (2009), Harford et al. (2009), Bakke and Whited (2010), Uysal (2011), and Elsas et al. (2014).

The paper proceeds in the following way. Section 2 surveys the relevant literature and develops the core of our method and hypothesis. Section 3 details the M&A and SEO sample

selection procedures. Section 4 presents the main results and comments on their implications. Several robustness and auxiliary tests are presented in Section 5, alongside a discussion of possible extensions and limitations. Finally, Section 6 concludes the paper.

2. Related Literature, Hypothesis Development and Empirical Design

2.1 PARALLELS BETWEEN STOCK-FINANCED M&As AND SEOs

The common knowledge regarding the wealth effects of M&As is that takeovers of public firms financed with stock lead to negative shareholder wealth effects, while cash offers are associated with "normal" announcement period returns for acquiring firm shareholders (Travlos, 1987). This differential effect is generally attributed to the adverse selection associated with issuing public equity. Myers and Majluf (1984) develop a model where, in the presence of information asymmetries, managers are only willing to issue stock when they believe it is overvalued. However, rational investors anticipate such behavior and perceive stock-financed mergers as a signal of firm overvaluation, driving the stock price of such acquirers down. The method of payment effect appears to be one of the most robust determinants of acquirer returns, with this result showing up in virtually all M&A studies. This pattern also extends into the long-run, as documented by Loughran and Vijh (1997).

Recently, however, Savor and Lu (2009) show that bidders who fail to consummate a stock-financed transaction due to exogenous reasons (such as blocking by antitrust regulators or competing bids) perform even worse than bidders who are successful in their pursuit of a stock-financed acquisition, and that this result is stronger for richly-priced bidders.[6] These findings imply

[6] Using a similar identification strategy (i.e., failed acquisition bids), Malmendier et al. (2014) show that cash offers reveal information about the *target firm*'s stand-alone value, while stock offers do not. This is evidenced by partial as

value creation from the use of overvalued stock as acquisition financing. What about the quality of the underlying investment decision? How do stock-financed M&As compare to their cash-financed counterpart purely on *investment* grounds? These are non-trivial questions; there is reason to believe that the quality of project selection may differ. Jensen (2005) suggests that overvalued equity increases managerial discretion and even coerces managers into making value-destroying investments, particularly stock-financed acquisitions.[7] If these agency costs are prevalent, stock-financed acquisitions should on average perform worse than cash-financed deals. Fu et al. (2013) support this view and provide evidence that stock deals driven by overvalued equity exhibit higher takeover premiums and inferior long-run performance. However, Ben-David et al. (2014) show that stock acquirers' performance is the same as that of similarly overvalued non-acquirers, concluding that stock deals underperform cash deals for stand-alone value reasons. We contribute to this debate by improving on the conventional event study techniques.

Essentially, a stock-financed acquisition is not just an investment decision but also an equity financing decision. For example, Rau and Stouraitis (2011) note: "A stock-financed acquisition is a combination of a financing activity (an SEO) and an investment activity (an acquisition). A cash-financed acquisition is more likely to be a pure investment." The extant literature on equity issues documents a stock price drop of about 2-3% around announcements of seasoned equity issues (Asquith and Mullins (1986); Masulis and Korwar (1986); Mikkelson and Partch (1986)). Although several explanations for this phenomenon have been put forward, the empirical evidence

opposed to complete reverting of target firm stock prices to their pre-offer levels in cash- and stock-financed bids, respectively.

[7] Note that we can be totally agnostic about the sources of equity overvaluation; that is, for the purpose of this argument it does not matter whether equity is overvalued due to asymmetric information, semi-strong market inefficiency, or investor irrationality. See also footnote 4 in Jensen (2005) for a discussion of this issue.

suggests that the release of negative information about the issuer's value – the adverse selection argument of Myers and Majluf (1984) – is the most suitable justification (see, e.g., Kalay and Shimrat (1987) and Brous (1992)). We contend that since a stock-financed acquisition implies a stock issue, part of the stock price reaction to stock-financed acquisition announcements can be attributable to the associated equity financing decision. This has been recognized by researchers in the past. For example, Hansen (1987: 77) writes: "[...] the analysis implies that exchange-medium considerations can confound the estimation of gains from mergers: exchange-medium choice signals acquiring-firm value, so there will generally be an effect on market value with a merger bid that is additional to any created by the merger itself." In addition, and much in the spirit of our empirical design, Eckbo et al. (1990: 668) note: "In general, the abnormal return to the bidder firm will consist of two components: (i) synergy revaluation - the market's revaluation of the expected synergy gain that is independent of the information provided by the medium of exchange choice; and (ii) signalling – the revelation of the bidder's private information concerning the true bidder/synergy value that is conveyed through the medium-of-exchange selection."

In fact, several stylized facts point out to the similarity between seasoned equity issues and stock-financed mergers. First, both seasoned equity issuers and stock acquirers tend to experience stock price run-ups prior to the event. Second, the effect of several determinants of announcement returns to stock acquisitions of public firms and equity issues is similar across the two types of events. For instance, the key intuition behind the Myers and Majluf (1984) model is that the higher the information asymmetry, the more negative the market reaction to equity issues is. Empirically, this result is well documented (for instance, Dierkens (1991); Lee and Masulis (2009)). Likewise, Moeller et al. (2007) document that high information asymmetry bidders experience lower announcement period returns in stock-financed public acquisitions. Similar patterns are also

observed for the pre-event stock price run-up (see Asquith and Mullins (1986) for SEOs and Rosen (2006) for mergers) and relative size of the issue/deal (see Asquith and Mullins (1986), Bayless and Chaplinsky (1996) for SEOs and Travlos (1987), Fuller et al. (2002) for mergers).[8] Finally, Alexandridis et al. (2010) show that stock mergers do not destroy value outside the most competitive takeover markets (US, UK, and Canada). Incidentally, the negative announcement effect of seasoned equity issues also does not show up in less developed markets (see Eckbo et al. (2007) for a summary).

These parallels between stock-financed acquisitions and SEOs suggest that a stock merger announcement should be thought of as having two major components: an equity financing part and a takeover part. While this joint-announcement nature of a stock-financed acquisition bid is implicitly assumed in Travlos (1987), no study to date has formally dealt with this joint announcement problem.[9] One exception is Bhagat et al. (2005) who show that announcement period returns to *tender offers* are subject to revelation bias (i.e., information about bidder stand-alone value and other information revealed by the bid plagues accurate estimation of the takeover gains). With respect to the method of payment, the authors conclude that the synergy gains in stock-financed tender offers are lower not because of inferior returns to such business combinations, but because of the information conveyed by equity financing.[10] Our approach allows us to disentangle the two announcements and to quantify the effect due to project selection.

[8] This is, necessarily, an incomplete list. One can find more similarities as the literatures on announcement returns to equity issues and mergers are vast and growing.

[9] Travlos (1987, footnote 23) writes: "[...] corporate acquisitions financed via common stock can be viewed as a special case of new offerings".

[10] Bhagat et al. (2005) study tender offers, which are only a small subset of all M&A deals. In addition, they are rarely structured as stock swaps. Our study includes both tender offers and mergers, and thus our results are more general.

2.2 EMPIRICAL SETUP

2.2.1 Linear Prediction

Our first approach is as follows. We start by running a cross-sectional regression of SEO issuer announcement returns (*ICAR*) on issuer and issue characteristics:

$$ICAR_i = X_i'\beta + u_{i,} \tag{2}$$

where $X_i^{'}$ is a vector of relevant issuer and issue characteristics, and u_i is an error term. Then, using the coefficient estimates (β) from equation (2) and the corresponding characteristics of stock acquirers ($X_j^{'}$), we estimate the share price effect that would have occurred to the stock acquirer as a result of independently announcing an issue of public equity. We label this hypothetical return as $HCAR_j$:

$$HCAR_j = E\left[ICAR_j\right] = E\left[X_j'\beta + u_j\right] \; iff \; STOCK_j = 1, \tag{3}$$

where $STOCK_j$ takes the value of 1 when the deal is financed with stock and 0 when it is financed with cash. Now, let $ACAR_j$ denote the entire acquirer announcement period return, and let $PCAR_j$ denote the part of the announcement period return attributable to the takeover and *not* to the equity issue decision. Then:

$$PCAR_j = \begin{cases} ACAR_j - HCAR_j & if \; STOCK_j = 1 \\ ACAR_j & if \; STOCK_j = 0 \end{cases} \tag{4}$$

We then test whether *STOCK* has a significant effect on *PCAR*. That is, we examine whether the method of payment affects the value of the acquisition as purely an investment project, after the associated equity financing effects have been taken into account.

2.2.2 Propensity-Score Matching

The principal difference of our second approach is in the way we define $HCAR_j$, the hypothetical stock price reaction that would have occurred in an event of an SEO by the stock acquirer. Here, we approximate it by the announcement returns of the SEO firms most closely resembling the stock acquirer in question. To identify these closest counterparts we utilize a variant of the propensity-score matching technique. Our propensity score is estimated by probit regression of the binary choice between a stock-financed M&A and an SEO on a vector of characteristics identical to that in equations (2) and (3) above. Our premise is that stock acquirers sharing characteristics of the SEO issuers would have likely experienced similar announcement effects. We use one-to-one and n-nearest-neighbors matching. Maintaining our earlier notation where subscript *i* denotes SEO firms and subscript *j* denotes M&A firms, for one-to-one matching we have:

$$HCAR_j = ICAR_i \;\; iff \; STOCK_j = 1, \tag{5}$$

such that *i*'s propensity score is closest to that of *j*. For n-nearest-neighbors matching we have:

$$HCAR_j = \frac{1}{n}\sum_i ICAR_i \;\; iff \; STOCK_j = 1, \tag{6}$$

where *i* belongs to the set of *n* SEO issuers with propensity scores closest to that of *j*. We set *n*=10 and *n*=50; alternative definitions yield similar results. We also experiment with kernel-based matching (Gaussian and Epanechnikov kernels) whereby all SEO firms are used as matches but weighted according to their propensity score distances and again find similar results. Having estimated $HCAR_j$ in these alternative ways we proceed as above and Equation (4) still governs the definition of $PCAR_j$.

3. Sample Selection

3.1 M&A SAMPLE

Our sample of M&As comes from Thomson Financial SDC M&A Database and covers the period from January 1, 1985 to December 31, 2009.[11] To be included in the sample, the transaction has to satisfy the following criteria:

1) The bidder and the target are US public firms.
2) The deal is completed, and is not classified as a bankruptcy acquisition, going private transaction, leveraged buyout, liquidation, privatization, repurchase, reverse takeover, or restructuring.
3) The bidder holds less than 10% of the target's shares prior to the announcement and obtains control of the target (more than 50%) as a result of the transaction.
4) The bidder is covered in the Centre for Research in Security Prices (CRSP) database (share codes 10 and 11, cases with multiple classes of common stock are excluded) with sufficient data to calculate announcement period returns.
5) The transaction value is at least $1M and represents at least 1% of bidder market capitalization measured 30 days prior to the announcement of the deal.
6) The method of payment is either 100% cash or 100% stock. Mixed offers are excluded to yield a clean experiment; however, in the Internet Appendix we relax this requirement and report the results including mixed cash/stock deals.

These screens are standard in the M&A literature (see, e.g., Masulis et al. (2007)). There are 3,002 deals that satisfy the above selection criteria. Out of these, 1,011 are pure cash-financed, and

[11] SDC's coverage of both M&As and SEOs prior to 1985 appears sparse.

the remaining 1,991 are pure stock-financed transactions.[12] The necessary control variables required for implementing our analysis are available for 2,576 observations (1,665 stock and 911 cash). The final M&A sample summary statistics are presented in Table I.

[Please Insert Table I About Here]

3.2 SEO SAMPLE

The SEO sample comes from Thomson Financial SDC New Issues Database and covers the period from January 1, 1985 to December 31, 2009. To be included in the sample, the issue has to conform to the following criteria:

1) The issuer is a US public firm offering common stock listed on NYSE, AMEX, or NASDAQ.
2) The issue is offered to the US public (non-domestic and simultaneous domestic-international offers are excluded).
3) The issue is not classified as a rights issue or a shelf offering, and is not accompanied by simultaneous offers of securities of other types (warrants or units).
4) The issuer offers only primary shares or a combination of primary and secondary shares (pure secondary offers are excluded).

[12] A related stream of literature examines the effects of the source of financing as opposed to the method of payment (medium of exchange). Analyzing a sample of 623 cash-financed deals, Schlingemann (2004) shows that deals where cash is likely to have come from prior equity issues are associated with higher bidder returns, which he attributes to the resolution of uncertainty regarding the use of the funds raised. Bidder returns were not found to be related to the amount of ex-ante debt financing. In a different study, however, Bharadwaj and Shivdasani (2003) show that in a sample of 116 cash-financed *tender offers* the use of bank debt for deal financing is associated with higher bidder returns (Martynova and Renneboog (2009) report similar findings for a sample of European M&As). Since our focus is the method of payment, we abstract from the sources of financing and treat all cash-financed deals as a single category.

5) The issuer is covered in CRSP database (share codes 10 and 11, which excludes closed-end funds, unit investment trusts, real estate investment trusts (REITs), and American Depositary Receipts (ADRs)) with sufficient data to calculate announcement period returns.

Again, these screens are common in the SEOs literature (see, e.g., Eckbo et al. (2000); Lee and Masulis (2009)). There are 3,780 SEOs that satisfy these criteria, and the necessary control variables are available for 3,212 observations. Table II presents summary statistics for the final SEO sample.

[Please Insert Table II About Here]

4. Empirical Findings

4.1 FIRST ESTIMATES

M&A and SEO samples similar to those used in our study have been extensively studied; therefore, we omit a detailed discussion of the sample statistics apart from noting that they are in line with prior studies. All continuous variables entering the analysis are winsorized at the 1st and 99th percentiles of the individual distributions within each sample (SEOs and acquisitions). Our conclusions are unchanged when we do not winsorize the variables.

Figure 1 shows the evolution of SEOs and acquisitions over time based on the distributions shown in Panel D of Table I and Panel B of Table II. It is evident that stock issues are drying up towards the end of the sample period. The same pattern is observed for stock-financed acquisitions; at the same time, cash-financed deals remain relatively stable over time. Presence of a strong positive correlation between SEOs and stock-financed M&As and lack of any correlation between SEOs and cash-financed M&As are consistent with the findings of Rau and Stouraitis (2011). This

evidence is the first empirical indication of the similarity between SEOs and stock-financed deals that we are advocating.

[Please Insert Figure 1 About Here]

Since the main interest of this paper is the wealth effects of acquisitions (and stock-financed acquisitions, in particular), our main variable is *ACAR*, which is the cumulative abnormal return of the acquirer in the 5-day announcement period centered on the acquisition announcement day.[13] Benchmark returns come from a market model estimated over 200 trading days ending 41 days prior to the announcement (CRSP value-weighted index is the market return). Detailed definitions of all variables can be found in the Appendix.

The mean (median) *ACAR* in our sample is -1.31% (-1.09%). Both numbers are statistically different from zero at the 1% level of significance. Partitioning the sample by the method of payment reveals a pattern of acquirer returns consistent with Travlos (1987). That is, cash acquirers experience, on average, a modest positive return of 0.50% (statistically significant at the 5% level), while stock acquirers exhibit an average return of -2.29%, which is significantly different from zero at better than 1% level. The difference in returns between cash and stock offers is 2.80% and is also statistically significant at better than 1% level. Median *ACAR*s follow the same pattern.

[13] We focus on short-run announcement returns and not on long-run post-merger returns or operating performance improvements because our approach relies on predicting the hypothetical return. Given the noise inherent in the predictions and the fact that this noise is expected to compound with longer horizons, the use of short-run abnormal returns maximizes the signal-to-noise ratio of our measures/approach. This also alleviates the usual complications arising from multiple deals done by the same firm over a long-run window. While the results are noisier, the general tenor of our conclusions is unchanged when we extend the event window to 30 or 60 trading days following the announcement.

We now turn to the return earned by firms announcing SEOs. The mean (median) issuer CAR (denoted as *ICAR*) is -3.16% (-3.05%), which is statistically different from zero at better than 1% level. This is consistent with the extant SEO announcement returns literature.

Our main argument is that stock-financed acquisitions can be considered a special case of SEOs, where the particular use of the funds is known. If that is the case, the announcement period return to a stock-financed acquisition should be thought of as having two components: a takeover part and an equity issue part. Then, if overvalued equity indeed erodes managerial discipline and project selection deteriorates, pure takeover returns of stock-financed deals should still be lower than those of cash deals. A quick back of the envelope calculation based on the above sample averages does not support the agency costs of overvalued equity hypothesis: subtracting the mean SEO return from the mean stock-acquirer return yields a "pure" takeover announcement effect of 0.87%, which is economically quite close to the 0.50% experienced by cash-acquirers. While being only suggestive in nature, this simple approximation provides the first evidence against the agency costs of overvalued equity story.

Of course, the characteristics of the firms announcing SEOs and those announcing stock-financed mergers can be quite different. A casual examination of the descriptive statistics for the SEO and stock-financed acquisitions samples reported in Tables I and II reveals that this is indeed the case. For example, SEO issuers are smaller in absolute size, make smaller issues, and exhibit higher stock price run-ups. As a consequence, the announcement returns of actual SEO firms and hypothetical SEO returns of stock acquirers may be different as well. We therefore need to make sure that we subtract "apples from apples". To that effect, one needs to estimate the share price effect that a stock acquirer would have experienced in the event of an SEO announcement given its characteristics (*HCAR*). This implied effect can then be subtracted from the actual

announcement period return of the stock acquirer to arrive at the "pure" takeover part of the announcement effect (*PCAR*). This is precisely what we do next.

4.2 IMPLIED EQUITY FINANCING AND "PURE" TAKEOVER RETURNS

In order to estimate the share price effect that the stock acquirer would have experienced in the case of an SEO announcement (designated as *HCAR)* we employ the two approaches outlined in Section 2.2. First, we estimate a cross-sectional regression of announcement returns for the SEOs sample and then use the coefficient estimates to predict the announcement effect that a stock acquirer would have experienced based on its own characteristics. Henceforth we refer to this method as linear prediction. Second, we match stock acquirers to SEO issuers on a one-dimensional propensity score that is a function of relevant characteristics, and treat the returns of the latter as the hypothetical SEO return of the stock acquirer – again based on the premise that firms sharing similar characteristics should experience similar announcement effects. Below we refer to this approach as propensity score matching.

Although the two methodologies to obtain *HCARs* rely on the same identifying assumption – similar firms should experience similar market reactions – the mechanics of the process of obtaining these counterfactuals are different. The linear prediction *HCAR* is, effectively, synthetically constructed by extrapolating the coefficient estimates from the SEO sample to the takeover sample and obtaining fitted values. In contrast, the propensity-score matching method assigns actual SEO announcement returns observed in the stock market for SEO issuers to stock acquirers with similar characteristics. There is no reason to believe that one method is superior to the other; we will therefore draw strong conclusions only when the two methods and/or most of

the specifications provide consistent results (i.e. whether the effect of stock payment on pure takeover returns is consistently negative).

The design of these tests requires us to identify variables that are i) common to both acquirers and equity issuers, and ii) that have been found to have significant effects on the returns of both types of events. We use these variables as explanatory variables in the cross-sectional model of SEO announcement returns in the linear prediction method, and as determinants of the propensity score in the propensity score matching method (based on a probit model where the dependent variable takes the value of 1 if the firm chooses to issue equity via a stock-financed acquisition, and 0 if it chooses an SEO). Based on prior literature, we include the following characteristics: firm size (*LN (MARCAP)*) (Lee and Masulis (2009) for SEOs; Moeller et al. (2004) for mergers), book-to-market ratio (*BEME*) (Bayless and Chaplinsky (1996) for SEOs; Servaes (1991) and Dong et al. (2006) for mergers), stock price run-up (*RUN-UP*) (Bayless and Chaplinksy (1996) for SEOs; Rosen (2006) for mergers), stock return idiosyncratic volatility (*SIGMA*) (Dierkens (1991) for SEOs and Moeller et al. (2007) for mergers), the relative size of the deal (issue or acquisition) (*RELSIZE*) (Asquith and Mullins (1986) for SEOs; Fuller et al. (2002) for mergers), cash holdings (*CASH HOLD*) (Kim and Purnanandam (2014) for SEOs; Harford (1999) for mergers), leverage ratio (*LEVERAGE*) (Lee and Masulis (2009) for SEOs; Maloney et al. (1993) for mergers), operating performance measured by the return on assets (*OPER PERFORM*) (Bayless and Chaplinsky (1996) for SEOs; Morck et al. (1990) for mergers) and cash-flow-to-equity (*CF/EQ*) (Jung et al. (1996) for SEOs; Lang et al. (1991) for mergers). We also include calendar year and industry (based on Fama-French 48 industries classification) fixed effects in these models.[14]

[14] We are not concerned with a potential selection bias arising from an omitted variable representing management's private information about firm overvaluation and, thus, influencing the decision to issue equity, because the

Panel A of Table III reports the estimation results for the cross-sectional regression model of SEO returns (specification (1)) and the probit model of equity issuance choice (specification (2)).[15] In the SEO returns model, size of the issuer and relative size of the issue have a positive effect on announcement returns, while idiosyncratic volatility and run-up have a negative effect. The fact that high *SIGMA* and high *RUN-UP* issuers exhibit lower returns is consistent with adverse selection behind negative announcement returns of SEOs (and, consequently, stock-financed acquisitions). In the equity issuance choice model, *LN (MARCAP)*, *BEME*, and *RELSIZE* obtain positive coefficients, while *RUN-UP*, *LEVERAGE*, *CASH HOLD*, and *CF/EQ* obtain negative coefficients significant at conventional levels. Thus, firms choosing to issue equity via a stock-financed acquisition are larger, have higher book-to-market ratios, make relatively larger issues, exhibit smaller pre-announcement stock price run-ups, are less levered, and have lower levels of cash holdings and cash-flow-to-equity. Propensity-score matching will help diminish differences in these characteristics to make matches more comparable on these dimensions.

[Please Insert Table III About Here]

Our next step is to use the model parameters to estimate the hypothetical stock price effect that stock acquirers would have experienced in the event of an equity issue (*HCARs*).[16] The distribution of predicted *HCARs* is reported in Panel B of Table III. Using the linear prediction method, the mean *HCAR* for our sub-sample of stock acquirers is -1.27%, statistically different

management of stock acquirers should possess, and be motivated by, the same type of private information when deciding to issue stock for financing an acquisition.

[15] We use the same characteristics in the SEO returns model and the SEO/Stock deal model because our overarching identifying assumption is the same for both methods: similar firms should share similar market reactions.

[16] We use the exact specifications from Table 3 to derive *HCARs*; that is, all independent variables, not just the statistically significant ones, are utilized. This is because our focus is on predicting the outcome rather than on establishing statistical significance of a particular determinant.

from zero at better than 1% level. For the propensity score matching approach using one-to-one, 10-nearest neighbors, and 50-nearest neighbors matching we obtain mean *HCAR* values of -3.19%, -2.53%, and -2.54%, respectively, all significant at better than 1% level. Median values are quite similar. Thus, our stock acquirers would have experienced significant negative announcement-period abnormal returns in the event of independently issuing equity via an SEO. There is also reasonable variation around the mean and median values.[17]

Panel C of Table III reports matching diagnostics for the propensity score matching method. We present the means of the nine explanatory variables forming the propensity score model for stock-financed acquisitions, unmatched SEOs, and the three types of matches. We also show their differences and the extent to which these differences are reduced by the matching. We also report these for the estimated propensity scores themselves.

While matching does not eliminate these differences completely in terms of statistical significance, it dramatically reduces their magnitudes in most cases. For instance, the gap in *LN (MARCAP)* is closed by 85.4%, 71.1% and 67.6% for one-to-one, 10 nearest and 50 nearest

[17] The mean and median *HCAR* under the linear prediction method are noticeably less negative than those under the propensity-score matching methodology. A natural question that arises is whether such less negative market reaction would have been a realistic outcome given the differences between SEO issuers and stock acquirers, or this is an underestimate and the market reaction would have been closer to that of actual SEOs. We investigate this issue further and note that stock acquirers are substantially larger than SEO firms, and firm size *(LN(MARCAP))* has a large positive effect in the SEO announcement returns regression (and hence on the predicted *HCAR*). It appears that extrapolating the firm size coefficient to stock acquirers may be problematic. We re-estimate our prediction models without this variable and find that the mean and median *HCAR* under linear prediction becomes more negative (mean of -2.10% and median on -2.23%), and more in line with the *HCAR* under propensity-score matching (means and medians ranging from -2.07% to -2.72%). Replicating our further analysis shows that our baseline results for the *PCAR* of stock-financed acquisitions and the coefficients on the *STOCK* indicator under linear prediction are likely biased downward because of the disproportionate effect of firm size on *HCAR*, working against rejecting the agency costs of overvalued equity hypothesis. We keep the size effect in our baseline results to remain conservative.

neighbours, respectively. Similarly, 94.1%, 91.1% and 90.6% of the gap in *RUN-UP* is eliminated. For other variables such as *BEME, OPER PERFORM, CF/EQ*, and in some cases *SIGMA*, the differences appear to be aggravated by the matching; this, however, should not be problematic as only *SIGMA* was a significant determinant of SEO returns in our *ICAR* regression.[18] The differences in propensity scores themselves between stock financed deals and matched SEOs are insignificant for one-to-one and 10 nearest neighbors, while there appears to be a significant difference for 50 nearest neighbors (the latter is unsurprising given that the difference in mean propensity scores increases with the number of matches by construction as one moves away from the best match). Overall, these diagnostics demonstrate that propensity score matching goes a long way in reducing the differences between stock-financed acquisitions and matched SEOs, making our extrapolation reasonable.

Having estimated the implied stock price drop due to the equity issue component of the announcement, we are able to estimate the "pure" takeover wealth effect for each stock acquirer by subtracting *HCAR* from *ACAR* of stock acquirers. We call the resulting variable *PCAR*. These figures are presented in Table IV. For the linear prediction method, the mean *PCAR* for the sample of stock acquirers is -1.02%. For the propensity score matching method, these figures are 0.91%, 0.23% and 0.22% for one-to-one, 10-nearest-neighbors and 50-nearest-neighbors, respectively. Only two of the four *PCARs* are significantly different from zero at the 5% level or better, and only one is negative. Therefore, stock-financed acquisitions do not consistently appear to be value destructive as *investment* decisions. This finding, in conjunction with the small positive returns in cash acquisitions, implies that the NPV of public firm takeovers is, in general, modest. This is what

[18] Some of the increases in differences, such as those for *OPER PERFORM* and *CF/EQ*, appear large at first sight; however, this is misleading as it is due to scaling by values that are close to zero. We have verified that our conclusions continue to hold when we exclude these two variables from the prediction models.

should be expected in a competitive market for corporate control. As a final step, we test for the differences in *PCARs* between cash and stock deals. The mean difference using the linear prediction method is 1.53%, significant at the 1% level. The mean difference is -0.41%, 0.28% and 0.29% for one-to-one, 10 nearest and 50 nearest neighbours matching, respectively; none is distinguishable from zero at the usual significance levels. Thus, when considering pure takeover effects there is no systematic difference in returns between cash and stock deals, which is inconsistent with the prevalence of agency costs of overvalued equity. In contrast, when considering the conventionally used entire announcement return (*ACAR*), the mean difference in returns to cash- and stock-financed deals is a substantial 2.80% and highly statistically significant (at better than 1% level). The median figures follow the same pattern, so we do not discuss them.

[Please Insert Table IV About Here]

However, this univariate comparison does not take into account other determinants of acquirer returns. In order to control for the possible differences between acquirers who chose to finance their acquisitions with cash rather than equity, which, on their own, determine acquirer returns, we also perform multivariate analysis of pure takeover announcement effects. That is, we take *PCAR* as the dependent variable and run cross-sectional regressions of these returns against the method of payment variable (*STOCK*) and other acquirer and deal-specific characteristics. For comparison purposes, we also run this regression with the conventional acquirer CAR (*ACAR*) as the dependent variable. Table V reports the results of this analysis.

We start with the conventional announcement returns (*ACAR)* regression to serve as our benchmark. In addition to the key variable of interest, the method of payment (*STOCK*), we include all the variables used in Table III, because, as noted above, these characteristics have been shown to affect acquirer returns. We also control for deal-specific characteristics namely, a dummy for

industry relatedness of the target (*DIVERSIFIC*) as motivated by Morck et al. (1990), deal attitude (*HOSTILE*) as motivated by Servaes (1991), the acquisition technique (*TENDER*) as motivated by Jensen and Ruback (1983), and competing bidders (*MULTIBID*) as motivated by James and Wier (1987). The regression is estimated with year and industry fixed effects, with standard errors clustered at the firm level. This *ACAR* specification produces the well-known result – the coefficient on the stock dummy is negative and highly statistically significant (in fact, *STOCK* is the single most significant variable in this regression). This corroborates the results of many prior studies, which have found stock-financed public acquisitions to be associated with lower announcement period returns.

The remaining regressions in Table V repeat this specification using *PCARs* computed with the linear prediction method (column (2)), one-to-one matching (column (3)), 10-nearest-neighbors matching (column (4)) and 50-nearest-neighbors matching (column (5)) as the dependent variable. If the coefficient on the method of payment variable is insignificantly different from zero, this indicates that the method of payment does not have explanatory power in the cross-section of pure takeover returns even after taking into account the confounding effects of other variables. This turns out to be generally the case. The magnitude of the coefficient on the stock dummy is reduced essentially to zero and is not statistically significant at conventional levels of significance for three definitions of *PCAR* out of the four, and the only significant coefficient (one-to-one matching) is *positive*. From the control variables, acquirer stock price run-up, cash holdings and cash flows-to-equity obtain consistently negative coefficients, while the tender offers indicator has a consistently positive effect on acquirer returns, all of which are in line with prior literature.

Thus, we are able to conclude that the method of payment generally has no further explanatory power in the cross-section of acquirer returns after separating out the implied equity

issue effect (even after taking into account other determinants of acquirer returns). This also implies that stock-financed acquisitions are not value destructive *investment* decisions.

The above results appear to be at odds with the predictions of Jensen (2005) regarding the agency costs of overvalued equity with respect to stock-financed acquisitions. The use of stock by bidders is frequently taken as evidence of bidder overvaluation (e.g., Rhodes-Kropf et al. (2005); Chemmanur et al. (2009)). Jensen (2005) posits that overvalued equity increases managerial discretion by making it easier for managers (and even coercing them) to pursue bad investment projects, including ill-conceived acquisitions financed with "cheap" equity. This argument implies that, other things equal, stock-financed acquisitions should be inferior investments. Our full sample findings are inconsistent with such view, as we find that the shareholder wealth effects associated with stock-financed M&As as pure *investment* decisions are very much comparable to those of cash-financed deals.

[Please Insert Table V About Here]

5. Robustness and Auxiliary Tests

In this section we perform and elaborate on several additional tests. The results are reported in various panels of Table VI. Given the repetitive nature of these tests, we only report the coefficients of interest (i.e., *STOCK* and any additional variables and their interactions where applicable). All other independent variables used in these regressions correspond to those used in the respective specifications of Table V.

5.1 WEALTH DESTRUCTION OF 1998-2001

Motivated by the results of Moeller et al. (2005), who document massive takeover-related wealth destruction at the turn of the 20th century, we further investigate this issue and re-run the cross-sectional regressions including a bubble period (*1998-2001*) dummy and its interaction term with the *STOCK* indicator.[19]The 1998-2001 period was associated with particularly excessive equity overvaluation, and thus the agency costs of overvalued equity should be most detectable there. Panel A of Table VI reports the results.

While the *STOCK* dummy itself obtains a *positive* and significant coefficient in three out of the four *PCAR* specifications, the interaction term obtains a negative coefficient significant at the 10% level in two out of the four *PCAR* specifications. The effect of stock payment appears to be somewhat different across the bubble and non-bubble periods. In order to judge whether there is a negative impact of stock payment during the bubble period, we compute the sum of the coefficients on *STOCK* and *STOCK X 98-2001* and its statistical significance. We find that the sum is negative and significant (-1.65, *t*-stat -2.31) in the first *PCAR* specification (linear prediction) and close to zero and insignificant in the remaining ones. Thus, there is some limited evidence that, when the overvaluation (and the potential agency cost) was particularly high, stock-financed deals were perceived by the market as inferior to cash-financed deals as investment decisions - consistent with the agency costs of overvalued equity hypothesis. However, we refrain from overemphasizing this result due to the lack of robustness across specifications.

[19] For this test, we also drop the year fixed effects.

5.2 OVERVALUATION-DRIVEN ACQUISITIONS

Our tests so far treat all stock-financed acquisitions equally.[20] We now attempt to improve on the results reported above by directly identifying deals driven by stock overvaluation. Specifically, we follow Fu et al. (2013) in using the market-to-book decomposition of Rhodes-Kropf et al. (2005) to identify acquirers that are overvalued in absolute terms, as well as relative to their targets. To conserve space, we refer the reader to Fu et al. (2013) for the details on the construction of the variables used below.[21] Results are reported in Panel B of Table VI.

In the first set of tests we use an *OV DUMMY* variable to indicate stock deals by acquirers overvalued in both absolute terms and relative to their targets. Since this variable can take the value of one for stock deals only, its coefficient should be interpreted as incremental to that on the *STOCK* indicator (i.e., just like an interaction term). While the coefficient on this new variable is generally negative, it does not attain statistical significance at conventional levels, neither in the *ACAR* nor in the *PCAR* regressions. To assess the overall effect of stock payment in the case when *OV DUMMY* takes the value of one, we again compute the sum of the coefficients on *STOCK* and the *OV DUMMY* and its statistical significance. This sum is negative and significant for the linear prediction *PCAR* specification (-1.21, *t*-stat -1.91) and close to zero and insignificant in the remaining ones.

In the second set of results, we use a continuous measure of relative overvaluation between the acquirer and the target (*ROV*) and interact it with the stock payment indicator. Interestingly,

[20] We thank the referee for suggesting the analysis in this and the following sections.

[21] We follow Fu et al. (2013) methodology with one necessary modification. While the authors use the sum of firm-level mispricing relative to industry-year valuations and industry-year-level mispricing relative to long-run industry valuations, we focus on the firm-level mispricing component only. This is to avoid conditioning the market reaction on future information (as our main variable of interest is announcement returns).

we find that the *ROV* variable is marginally positive on its own, but its interaction with stock is again insignificant. The findings of these tests suggest that the agency costs of overvalued equity in the form of inferior stock-financed acquisitions are not detectable (except for one case) even when we focus on deals that are likely driven by stock overvaluation. Note, however, that these conclusions rely on the validity of the market-to-book decomposition as a proxy for overvaluation.

5.3 GOVERNANCE INTERACTIONS

It is possible that agency costs of overvalued equity are prevalent in firms where governance is weak and oversight is lax. We therefore interact the stock indicator with proxies for firm governance. We use free cash flow and cash holdings (associated with increased managerial discretion and wasteful spending, see Jensen (1986) and Harford (1999)), leverage (has a monitoring and disciplining effect, see Maloney et al. (1993)), and operating performance (proxies for management quality, see Morck et al. (1990)). In addition, we use product market competition (*IND COMP*) as an external governance mechanism, which has been shown to overshadow internal governance (see Giroud and Mueller (2010; 2011)).[22] We favor these indirect governance proxies over the more direct governance measures such as board structure and ownership for two reasons. First, we believe the indirect measures are relatively less susceptible to endogeneity because they are often determined by the underlying fundamentals of the business that are not easy to change. For example, cash flows that the business is generating are determined by the profitability of the investment projects made many periods before; leverage is often determined by the industry norms, the type of assets available for collateral, and credit market conditions; and industry

[22] Following Giroud and Mueller (2010; 2011), product market competition is defined as the sum of squared market shares (based on sales) of all Compustat firms in that industry and year, with industries defined using the Fama-French 48 industry classification.

competition is something the firm has little control of (short of exiting the industry). In contrast, direct governance mechanisms represent conscious choices. Second, the direct governance measures are available only for S&P 1500 firms and only after 1992, which substantially reduces the sample size.[23]

Results are reported in Panel C of Table VI. We find that from all the governance interactions, only the cash holdings interaction obtains a negative and significant coefficient in the *ACAR* and two *PCAR* specifications, suggesting that the underlying takeover returns in stock-financed deals become increasingly lower as acquirer cash holdings increase. This is consistent with Harford (1999), who argues for an agency effect of large cash holdings. All other governance interactions obtain insignificant coefficients.

Overall, we find only limited evidence in favor of the agency costs of overvalued equity story. It is possible, however, that agency costs of overvalued equity manifest themselves via other channels suggested by Jensen (2005), such as earnings manipulation or outright fraud.

5.4 CONFOUNDING INFORMATION IN SEO ANNOUNCEMENTS

An issue of potential concern is the information about the intended use of the funds raised in an SEO that is released to the market at the time of the announcement. If this information has not been previously communicated to the market, then investors will also be reacting to this information, potentially confounding the estimation of the equity financing decision wealth effects. The exact direction of the bias, however, depends on the market's expectation of the usage of the

[23] We have nevertheless experimented with additional governance proxies used by Fu et al. (2013), namely, board size, strong boards, Bebchuk et al. (2009) entrenchment index, executive ownership, and institutional blockholdings. Only board size and institutional blockholdings interactions obtain significant coefficients, but with the wrong signs (large boards appear to help, not hurt, and institutional blockholdings appear to hurt, not help).

funds raised (i.e., value-creative or value-destructive investments). In treating SEOs as pure financing events, we are making an implicit assumption that the value-creative and value destructive motives and abilities are evenly distributed across firms, such that the average investment effect is zero and the estimated *HCARs* reflect the pure financing impact. This assumption is in line with the findings of Denis (1994) who finds that various proxies for the profitability of investment opportunities are not able to explain the cross-section of issuer returns. Nevertheless, we perform two additional tests designed to further alleviate the concerns that our *HCARs* are biased by the anticipated wealth effects from the usage of funds.

To deal with this issue, we obtain the information on the intended use of funds raised in our sample SEOs from Thomson Financial SDC. Table A.I of the Internet Appendix presents the distribution of primary uses of funds. While there are cases where the issuer specifies that the proceeds will be used to fund specific investment, in over 61% of the cases the issuer intends to use the funds for "general corporate purposes", which provides the market with little information in addition to the capital raising decision. Arguably, these SEOs are closer to "pure" financing announcements. Hence, our first test is to re-run our analysis restricting the SEO (estimation) sample to these "general corporate purposes" SEOs. Panel D of Table VI reports the results. The *STOCK* coefficient obtains a small *positive* and significant coefficient in the three *PCAR* specifications using the propensity-score matching method. This result is again inconsistent with the agency costs of overvalued equity hypothesis, which predicts a negative coefficient on the *STOCK* indicator. Note also that this test is conservative. Additional information regarding the use of proceeds is only an issue of concern if this information has not been previously announced to investors (capital expenditure/acquisition plans are often announced in advance).

In our second, and even more conservative test, we restrict our estimation sample to equity-for-debt exchange offers – those where the stated primary use of SEO proceeds is to retire existing debt securities or bank debt. These are pure financing/capital structure events and the market reaction to such announcement should contain no anticipated investment effects, thereby allowing us to capture the pure financing effects we are after. Masulis (1980) and Cornett and Travlos (1989) study exchange offers and conclude that equity-for-debt swaps are associated with negative market reaction of the order similar to that in general SEOs. Furthermore, Cornett and Travlos (1989) demonstrate that this market reaction is consistent with information effects associated with financing choices. We select SEOs with the primary uses of funds stated as "recapitalization", "reduce indebtedness", "refinance/retire acquired debt", "refinance/retire bank debt", and "refinance/retire fixed income debt". These represent 25% of all SEOs. We re-estimate *HCARs* using these SEOs and re-run the analysis. The results are reported in Panel E of Table VI. We find that the coefficient on the *STOCK* indicator is negative in one (one-to-one) and positive in another (50 nearest neighbours) *PCAR* specification. In the absence of a consistent pattern our main inferences remain unchanged. Overall, the results of these tests suggest that our use of general SEOs as pure financing events throughout the paper is reasonable and does not impair our conclusions.

Finally, if one is not ready to accept that general SEOs or their subsets examined in this section represent pure financing events, and maintains that the market reaction is still contaminated with the expected value implications of the use of proceeds, then our main tests have another interesting interpretation. Specifically, if the SEO announcements contain both a financing and an investment component, then by subtracting this from the stock acquirer's CAR we are subtracting both of its implied components, and the *PCAR* for stock deals is then the *difference* between the

expected value consequences of stock mergers and the anticipated use of SEO proceeds. If this value on average is not statistically different from zero – which is what we generally observe in Table IV – then the conclusion one can draw is that stock-financed acquisitions are thought by the market to be no better or worse than the anticipated investment of the SEO proceeds. Comparisons with cash deals would not be meaningful in this case.

5.5 CASH-FINANCED DEALS AND BOND ISSUES

We have assumed throughout the analysis that, for cash-financed deals, $PCAR \equiv ACAR$, i.e., no new financing announcement is made. Although cash-financed deals are more likely to be pure investment decisions (announcements), not all cash acquirers hold enough cash reserves to pay for the deal – some firms issue debt to finance the purchase (either outright, or later on to replace any bridge financing received from the investment banks advising on the deal). Harford et al. (2009) present evidence of debt issuance following large cash-financed deals. Therefore, a case can be made that, just like a stock-financed acquisition announcement has an implied equity issue component, a cash-financed acquisition can imply an imminent debt issue. Consequently, the announcement return to a cash-financed deal (*ACAR*) should also be decomposed into *PCAR* and *HCAR*, where *HCAR* should be estimated from announcement returns to corporate debt (bond) issues.

The existing literature on corporate bond issues reports insignificant returns to announcements of such issues (for a survey, see Eckbo et al. (2007)). Therefore, our assumption of *ACAR*s in cash-financed deals being uncontaminated by any financing effects seems plausible, and we do not expect our results to be affected in a material way. Nevertheless, we have obtained

a sample of bond issues from Thomson Financial (SDC)[24] and performed this analysis. Panel F of Table VI reports the results. In line with our expectations, "purifying" *ACAR*s in cash-financed deals by subtracting the estimated stock market reaction that the firm would have experienced in the event of a *bond issue* does not alter their magnitude in a systematic way: in one *PCAR* specification (linear prediction) out of the four the *STOCK* dummy becomes significantly negative with its magnitude more than halved compared to the *ACAR* specification, while in two others it is significantly positive. Thus, we may argue that our main conclusions remain unchallenged.

5.6 PRICE PRESSURE EFFECTS

Mitchell et al. (2004) document significant price pressure on the acquiring firm's stock in stock-financed deals as a result of merger arbitrage trading, which requires buying the target firm stock and short selling the acquiring firm stock. They further show that this price pressure accounts for a portion of the difference in acquirer returns between cash and stock deals. In order to establish whether our results still hold after accounting for this price pressure effect we perform the following analysis. First, we raise the M&A sample selection thresholds to at least \$10M, and at least \$100M deal value, respectively (deal size proxies for the feasibility of merger arbitrage trading). Second, we construct a variable to capture the effect of merger arbitrage price pressure on the market reaction. This variable, which we label *IMPACT*, is defined as the deal value relative

[24] There are 17,729 corporate bonds issued by publicly listed firms during our sample period with announcement returns available (of them 10,707 by financials, 1,392 by utilities, and 5,630 by industrial firms). However, most issues contain multiple tranches of different maturities, and Thomson Financial SDC reports them as separate observations. We aggregate them into one by summing over the principal amounts for each issuer-filing date combination, thereby obtaining 3,067 unique bond issue announcements (filings). The mean issuer return is -0.10%, statistically indistinguishable from zero (p-value of 0.203), similar to earlier studies.

to the average dollar trading volume in the acquiring firm's stock.[25] The intuition behind this measure is that the larger the deal relative to the usual liquidity of the acquirer's stock, the larger the price pressure effect from merger arbitrage short selling in stock-financed deals is. We include this variable and its interaction with *STOCK* deals in our *ACAR* and *PCAR* regressions. If price pressure is detectable, we expect to find a negative coefficient on the interaction term. Panel G of Table VI reports the results (the first set of coefficients is for the sample restricted to mergers worth at least $10M, and the second is for the sample restricted to deals worth at least $100M).

The interaction term is negative and statistically significant in almost all *ACAR* and *PCAR* regressions, and significantly more so for deals larger than $100M. As this variable proxies for the price impact of merger arbitrageurs' short-selling, this result is consistent with the price pressure effect documented by Mitchell et al. (2004). The fact that the price impact is stronger in larger deals is consistent with practice (indeed, there is not much room for merger arbitrage trading in small stock-financed deals). However, even after controlling for this price pressure effect, the *STOCK* dummy continues to be negative and significant in *ACAR* regressions, while it is negative and significant in only one *PCAR* regression out of eight, and positive in two others. This evidence leads us to conclude that, while price pressure from merger arbitrageurs' actions does lead to lower announcement returns in stock-financed deals, the implied equity issue (adverse selection) appears to be the dominating effect behind negative announcement returns.

More broadly, to the extent that downward price pressure from merger arbitrage is significant, our estimates of *PCARs* as pure value implications of stock-financed acquisitions and the coefficient on the *STOCK* indicator in our baseline results are downward biased, working

[25] Average dollar trading volume is measured over the period of 30 trading days ending 6 days prior to the deal announcement.

against rejecting the agency costs of overvalued equity hypothesis. However, a potentially offsetting effect may stem from investor inertia, which we discuss next.

[Please Insert Table VI About Here]

5.7 INVESTOR INERTIA

The implicit assumption behind our methodological approach is that the magnitude of the stock price reactions in SEOs and stock-financed acquisitions are identical for given firm and issue characteristics. While this is an intuitive supposition, Baker et al. (2007) argue that, in the presence of investor inertia, the announcement effects in pure SEOs should be more negative than in stock-financed acquisitions because investors exhibiting inertia do not resell the acquirer's stock received in the exchange, while investors in SEOs have to actively "opt into" buying the new issue. This makes the returns in stock-financed acquisitions less negative then they might have been in an SEO followed by a takeover. If this is the case, the investment value creation component of the announcement return (*PCAR*) for stock-financed deals could be upward biased.

As noted above this effect is likely to be confronted by the additional price pressure from merger arbitrageurs who short sell the acquirer's stock, as shown directly in Mitchell et al. (2004) and indirectly in the previous section. This phenomenon is specific to stock-financed acquisitions and is not present in pure SEOs. Thus, the reduced price pressure from passive investors could be offset by the extra price pressure from merger arbitrage. We therefore believe that our assumption regarding the similarity of the stock price effects for given firm and issue characteristics is a plausible one.

5.8 ENDOGENEITY OF THE METHOD OF PAYMENT CHOICE

One issue that the above analysis does not take into account is the possible endogeneity of the method of payment decision. If firms that choose to pay with cash are fundamentally different from those which choose to pay with equity, then the estimates in Table V could be biased. Ultimately, the question that we need to answer is "what is the effect of paying for the acquisition with stock on *PCAR* for a firm that chose to pay with cash but was just as likely to pay with equity instead". Propensity score matching techniques allow us to address this question as well (for a recent application of propensity score matching to the estimation of treatment effects in finance research see Drucker and Puri (2005)). To that end, stock-financed deals are compared to matched cash-financed deals, where the matching is based on a one-dimensional propensity score that is a function of acquirer- and deal-specific characteristics.

When we implement the matching estimator and match each stock-financed deal to 50 cash deals (results are identical if we use one or 10 neighbors) closest on the propensity-score that is a function of all the control variables used in Table V, we find that the treatment effect of the method of payment is significantly negative when the outcome variable is *ACAR* (-2.69%), but is not significantly different from zero when the outcome variable is *PCAR* (*PCAR_LINEAR* = -1.42%, *PCAR_PROP1*= 0.52%, *PCAR_PROP10* = -0.17%, *PCAR_PROP50* = -0.19%) with the exception of the linear prediction method. These results are the same as those in Table IV where no matching is performed, suggesting that our findings are robust to controlling for selection on observable characteristics. Ideally, though, one would want to explicitly model the endogeneity of the payment choice in a two-stage framework that accounts for selection on unobservable characteristics. This, of course, requires an instrumental variable that is correlated with payment choices but uncorrelated with the unobservable private information revealed by the decision to

issue equity. Finding a source of such exogenous variation in payment method is an undertaking that is beyond the scope of our paper, but maybe a fruitful avenue for future research.

5.9 EXTENSIONS

We have established that stock-financed takeovers are as value creative as (or, more accurately, as value-neutral as) cash-financed deals in terms of the underlying investment decisions, and that the negative announcement effects associated with stock swaps are just a financing impact due to adverse selection. Although we have focused on public firm acquisitions to demonstrate this idea, our approach is, in fact, more general and can also be applied to *private* firm acquisitions, where, on the contrary, stock-financed deals are associated with higher announcement returns than cash-financed takeovers (Chang (1998) and Fuller et al. (2002)).

Issuing stock to a small set of private shareholders of the target firm is akin to issuing equity in a private placement. Incidentally, private placements are associated with significant positive announcement effects as documented by Wruck (1989) and Hertzel and Smith (1993). Applying our logic to the case of private firm acquisitions, announcement returns in private stock deals can be also thought of as having two distinct components – a takeover part and a *private placement* part. It could be the case that, by applying our methods to disentangle the two components, it turns out that the takeover part, which is responsible for the investment value creation (i.e., *PCAR*), is actually the same across the two types of deals, and that the difference in total announcement returns is solely due to the financing decision. We report the results of this analysis in Table VII.

Our private acquisitions and private placements samples follow the same selection criteria as above.[26] Using the conventional *ACARs* as the dependent variable, we find that private acquisitions paid for with stock exhibit returns that are, on average, 0.58% higher than those paid for with cash (the coefficient is significantly different from zero at the 10% level), consistent with Chang (1998) and Fuller et al (2002). Interestingly, when using *PCARs* purified by subtracting hypothetical private placement returns, we find that in three specifications out of the four the magnitude of the coefficient is reduced and it loses statistical significance. However, it is positive and statistically significant in one specification (one-to-one matching).

It is important to note at this stage that paying with stock in private acquisitions can indeed be value creative (information effects aside): private targets are opaque and difficult to value, and paying with stock allows the acquirer to share any overpayment with the shareholders of the target (see Hansen (1987) for the theoretical model and Officer et al. (2009) for the empirical evidence). Therefore, our failure to completely explain away the differential returns in cash and stock private firm acquisition can be due to this effect.

[Please Insert Table VII About Here]

Finally, we note that the intuition behind our methodology is very broad and can be applied in other contexts where joint-announcements complicate inferences. For instance, Nayak and Prabhala (2001) report that almost 80% of stock splits by dividend-paying firms are announced simultaneously with a dividend announcement, which has led researchers to omit such firms from the analysis, leaving a small and, probably, selected sample. Our approach can effectively deal with this issue.

[26] The final samples contain 7,128 private firm acquisitions (of them 4,732 are acquisitions of stand-alone private firms and 2,396 are acquisitions of subsidiaries) with a mean 5-day cumulative abnormal return of 1.98% (p-value of 0.000) and 1,473 private placements with a mean 5-day cumulative abnormal return of 0.33% (p-value of 0.371).

5.10 OTHER SENSITIVITY TESTS

The results documented in this paper are also robust to the following minor alterations to the research design: i) use of (-1, +1) event window for the announcement period return instead of (-2, +2); ii) use of market-adjusted abnormal returns instead of market-model-adjusted, iii) use of an equally-weighted CRSP index as a proxy for the market return instead of value-weighted; iv) exclusion of financials (SIC codes 6000-6999) and utilities (SIC codes 4900-4999) from both the M&As and the SEOs samples; v) restricting the M&As sample to 100% acquisitions; vi) restricting the SEOs sample to only primary issues; vii) including unsuccessful deals in the M&A sample; viii) replacing *LN (MARCAP)* with *LN (EV)*, where *EV* is the enterprise value, defined as *MARCAP* plus the book value of short- and long-term debt taken from Compustat. In all cases, we find that there is no consistently negative effect of stock payment on *PCARs* when the results from both linear prediction and propensity-score matching techniques are taken as a whole.

In addition, we have also addressed the timing of the SEOs with respect to the subsequent M&A announcements by the issuing firms as such SEOs might reveal some forthcoming takeover news to the market. Our results are unchanged when we exclude SEOs by the M&A sample firms falling within one or two years prior to, or after, the M&A announcement. We also separately analyse the market reactions to deals by acquirers having recently performed an SEO. We find that having conducted an SEO within one or two years prior to an acquisition further reduces announcement returns for stock deals, but not for cash acquisitions – consistent with severe adverse selection. These results are reported and commented on in the Internet Appendix. Finally, we have also extended our analysis to mixed payment deals, which produced qualitatively similar results. This analysis and the associated discussion can also be found in the Internet Appendix.

6. Conclusion

We contribute to the debate on the existence of agency costs of overvalued equity and the resultant suboptimal investment by firms (Jensen (2005)). Using M&A deals as our testing ground, we also offer new evidence on whether stock-financed acquisitions destroy value for shareholders. Our innovation is to empirically implement the argument that a stock-financed acquisition announcement should be thought of as having two distinct components: a takeover component and an equity issue component. Using a sample of SEOs, we estimate the latter component and disentangle the two parts of the announcement effect. After the implied equity financing component is taken away from the announcement return of stock acquirers, the method of payment generally has no further explanatory power in the cross-section of acquirer returns. This result runs contrary to the predictions regarding the agency costs of overvalued equity with respect to stock-financed acquisitions. There is, however, some limited evidence that such agency costs were present during the bubble period of 1998-2001, and that stock acquirers with large cash hoards may be more prone to suboptimal deal making.

More broadly, if one accepts that our methodology effectively purges the market reaction to stock mergers from the financing effects and allows capturing the pure value consequences of the underlying investment decisions, our results suggest, for the first time in the literature, that stock-financed acquisitions are non-value-destructive investment projects. Coupled with normal or small positive abnormal returns to cash acquirers, these findings suggest that public firm acquisitions in general are small-to-zero NPV investments. The lack of large value gains in corporate acquisitions can be interpreted as consistent with the existence of a competitive market for corporate control.

Appendix

VARIABLE DEFINITIONS

Variable	Definition
	Panel A: Dependent variables and the method of payment
ICAR	Cumulative abnormal return of the SEO issuer in the 5-day event window (-2, +2) centered on the announcement (filing) day reported by Thomson Financial SDC. The expected returns are from a market model with the parameters estimated over 200 trading days ending 41 days prior to the announcement. The market return is proxied by CRSP value-weighted index return.
HCAR	Hypothetical stock price reaction in an event of an SEO by the stock acquirer calculated as a linear prediction (obtained by multiplying the stock acquirer characteristics by the coefficient estimates from a regression of ICAR on the corresponding issuer characteristics) or as returns of propensity-score-matched SEO issuers.
ACAR	Cumulative abnormal return of the acquiring firm in the 5-day event window (-2, +2) centered on the announcement day reported by Thomson Financial SDC. The expected returns are from a market model with the parameters estimated over 200 trading days ending 41 days prior to the announcement. The market return is proxied by CRSP value-weighted index return.
PCAR	ACAR - HCAR when the acquisition is stock-financed (STOCK = 1), ACAR when the acquisitions is cash-financed (STOCK = 0).
STOCK	Indicator variable: 1 for deals where consideration is 100% stock, 0 for deals where consideration is 100% cash, as reported by Thomson Financial SDC.
	Panel B: Acquirer/issuer characteristics
MARCAP	Market capitalization 4 weeks prior to the acquisition/issue announcement from CRSP (in $ mil. inflation-adjusted to 2009 using the US GDP deflator)
BEME	Book value of equity divided by market value of equity (shares outstanding times the closing price) at the fiscal year-end immediately prior to the announcement, all numbers are from Compustat.
RUN-UP	Buy-and-hold excess (market-adjusted) return of the firm's common stock over the period starting 205 days and ending 6 days prior to the announcement date from CRSP.
SIGMA	Idiosyncratic volatility of the firm's common stock measured as the standard deviation of daily excess (market-adjusted) returns from CRSP over the period starting 205 and ending 6 days before the announcement.
LEVERAGE	Total financial debt (long-term debt plus debt in current liabilities) divided by the book value of total assets for the fiscal year prior to acquisition announcement from Compustat.
CF/EQ	Income before extraordinary items plus depreciation minus dividends on common and preferred stock divided by the number of shares outstanding times the closing stock price at the fiscal year-end immediately prior to the announcement from Compustat.
CASH HOLD	Cash and cash equivalents divided by the book value of total assets for the fiscal year-end immediately prior to the announcement from Compustat.

OPER PERFORM	Operating income before depreciation divided by the book value of total assets for the fiscal year-end immediately prior to the announcement from Compustat.
	Panel C: Deal/issue characteristics
DEAL VALUE	Value of the deal/issue as reported by Thomson Financial SDC (in $ mil. inflation-adjusted to 2009 using the US GDP deflator).
RELSIZE	Value of the deal/issue from Thomson Financial SDC divided by the acquirer/issuer market value of equity 4 weeks prior to the announcement from CRSP.
HOSTILE	Indicator variable: 1 for deals labelled as "hostile" or "unsolicited" by Thomson Financial SDC, 0 otherwise.
DIVERSIFIC	Indicator variable: 1 for cross-industry deals, 0 for same industry deals. Industries are defined using Fama-French 48 industries classification.
TENDER	Indicator variable: 1 for tender offers identified as such by Thomson Financial SDC, 0 otherwise.
MULTIBID	Indicator variable: 1 for deals involving competing bidders as reported by Thomson Financial SDC, 0 otherwise.
PURE PRIMARY	Indicator variable: 1 for equity offers comprising only newly issued shares as reported by Thomson Financial SDC, 0 otherwise,
COMBINED	Indicator variable: 1 for equity offers which include secondary shares as reported by Thomson Financial SDC, 0 otherwise.

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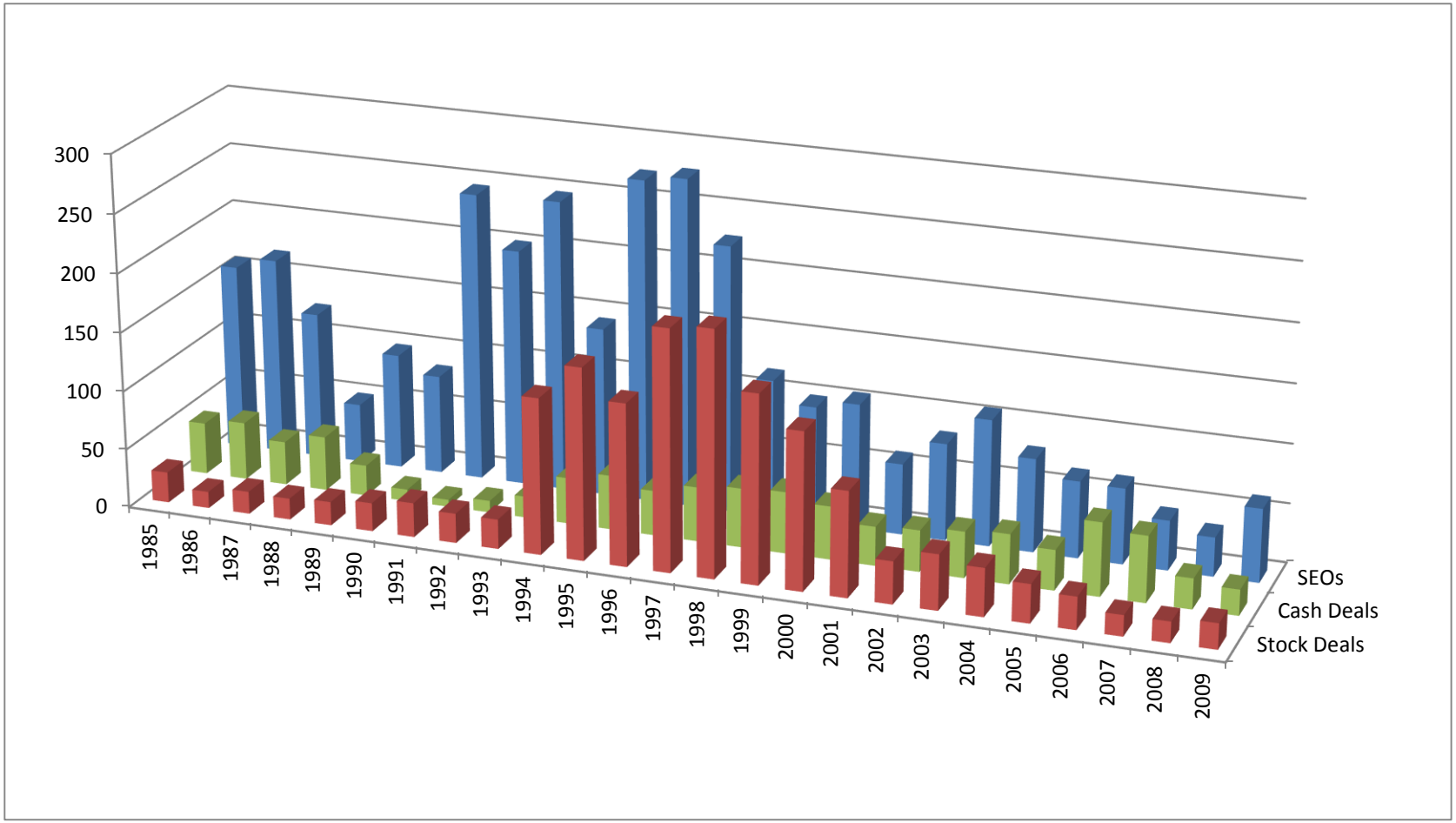

Figure 1. Evolution of the occurrence of SEOs, stock-financed acquisitions, and cash-financed acquisitions over the sample period. The M&A sample includes successful US public firm acquisitions over the period between January 1, 1985 and December 31, 2009 drawn from the Thomson Financial SDC M&A Database. The table presents sample descriptive statistics for a sample of successful SEOs by US issuers over the period between January 1, 1985 and December 31, 2009 drawn from the Thomson Financial SDC New Issues Database.

Table I. M&A sample descriptive statistics

The table presents sample descriptive statistics for a sample of successful US public acquisitions over the period between January 1, 1985 and December 31, 2009 drawn from the Thomson Financial SDC M&A Database. All variables are defined in the Appendix. Panels A, B and C are for all deals, stock deals, and cash deals, respectively. Panel D presents the yearly composition, and Panel E the industry composition of the sample. N denotes the number of observations. Dollar values are inflation-adjusted to the level of 2009 using the US GDP deflator. All continuous variables are winsorized at the 1st and 99th percentiles.

Panel A: All	N	MEAN	SD	MIN	P25	MEDIAN	P75	MAX
MARCAP ($mil.)	2,576	7,179.097	18,281.350	12.413	316.908	1,257.557	5,067.570	121,753.100
BEME	2,576	0.476	0.354	0.019	0.243	0.400	0.618	2.143
RUN-UP	2,576	0.131	0.525	-0.681	-0.139	0.044	0.256	2.899
SIGMA	2,576	0.027	0.017	0.008	0.015	0.022	0.032	0.098
LEVERAGE	2,576	0.187	0.159	0.000	0.058	0.161	0.274	0.697
CASH HOLD	2,576	0.156	0.191	0.002	0.031	0.068	0.207	0.832
OPER PERFORM	2,576	0.085	0.135	-0.543	0.027	0.081	0.166	0.365
CF/EQ	2,576	0.049	0.130	-0.797	0.032	0.058	0.093	0.339
DEAL VALUE ($mil.)	2,576	964.475	2,683.313	4.050	55.030	172.035	563.000	18,529.400
RELSIZE	2,576	0.319	0.413	0.011	0.056	0.163	0.409	2.474
DIVERSIFIC	2,576	0.321	0.467	0	0	0	1	1
HOSTILE	2,576	0.016	0.125	0	0	0	0	1
TENDER	2,576	0.173	0.378	0	0	0	0	1
MULTIBID	2,576	0.036	0.188	0	0	0	0	1
ACAR	2,576	-1.31%	7.84%	-26.06%	-4.90%	-1.09%	2.14%	23.34%
Panel B: Stock								
MARCAP ($mil.)	1,665	6,451.306	17,211.220	12.413	284.106	1,103.338	4,443.740	121,753.100
BEME	1,665	0.435	0.328	0.019	0.221	0.374	0.570	2.143
RUN-UP	1,665	0.182	0.597	-0.681	-0.127	0.074	0.300	2.899
SIGMA	1,665	0.029	0.019	0.008	0.016	0.024	0.036	0.098
LEVERAGE	1,665	0.178	0.156	0.000	0.053	0.149	0.263	0.697
CASH HOLD	1,665	0.162	0.203	0.002	0.033	0.066	0.210	0.832
OPER PERFORM	1,665	0.062	0.146	-0.543	0.025	0.037	0.145	0.365
CF/EQ	1,665	0.032	0.136	-0.797	0.025	0.051	0.079	0.339
DEAL VALUE ($mil.)	1,665	1,149.202	3,157.049	4.050	54.000	169.620	581.500	18,529.400
RELSIZE	1,665	0.345	0.390	0.011	0.068	0.200	0.492	2.474
DIVERSIFIC	1,665	0.264	0.441	0	0	0	1	1
HOSTILE	1,665	0.004	0.060	0	0	0	0	1
TENDER	1,665	0.014	0.117	0	0	0	0	1
MULTIBID	1,665	0.016	0.126	0	0	0	0	1
ACAR	1,665	-2.294%	8.339%	-26.059%	-6.176%	-1.938%	1.458%	23.338%
Panel C: Cash								
MARCAP ($mil.)	911	8,509.254	20,032.140	12.413	365.141	1,600.106	6,159.875	121,753.100
BEME	911	0.552	0.385	0.019	0.288	0.459	0.714	2.143
RUN-UP	911	0.036	0.341	-0.681	-0.154	-0.010	0.176	2.600
SIGMA	911	0.022	0.012	0.008	0.014	0.019	0.027	0.098
LEVERAGE	911	0.203	0.163	0.000	0.067	0.186	0.289	0.697
CASH HOLD	911	0.144	0.167	0.002	0.025	0.070	0.205	0.832
OPER PERFORM	911	0.127	0.100	-0.543	0.050	0.133	0.186	0.365
CF/EQ	911	0.079	0.114	-0.797	0.047	0.075	0.113	0.339
DEAL VALUE ($mil.)	911	626.856	1,404.376	4.050	57.970	178.620	540.140	17,068.790
RELSIZE	911	0.270	0.449	0.011	0.043	0.107	0.289	2.474
DIVERSIFIC	911	0.425	0.495	0	0	0	1	1
HOSTILE	911	0.038	0.192	0	0	0	0	1
TENDER	911	0.463	0.499	0	0	0	1	1
MULTIBID	911	0.074	0.261	0	0	0	0	1
ACAR	911	0.501%	6.446%	-26.059%	-2.764%	0.153%	3.273%	23.338%

Table continues on the next page

Table I. (Continued)

Panel D: Distribution by year

	ALL		STOCK		CASH	
	N	%	N	%	N	%
1985	70	2.72%	26	1.56%	44	4.83%
1986	63	2.45%	14	0.84%	49	5.38%
1987	56	2.17%	19	1.14%	37	4.06%
1988	64	2.48%	18	1.08%	46	5.05%
1989	46	1.79%	20	1.20%	26	2.85%
1990	34	1.32%	24	1.44%	10	1.10%
1991	35	1.36%	29	1.74%	6	0.66%
1992	35	1.36%	25	1.50%	10	1.10%
1993	43	1.67%	25	1.50%	18	1.98%
1994	171	6.64%	132	7.93%	39	4.28%
1995	208	8.07%	162	9.73%	46	5.05%
1996	175	6.79%	137	8.23%	38	4.17%
1997	249	9.67%	203	12.19%	46	5.05%
1998	257	9.98%	207	12.43%	50	5.49%
1999	211	8.19%	159	9.55%	52	5.71%
2000	178	6.91%	133	7.99%	45	4.94%
2001	122	4.74%	89	5.35%	33	3.62%
2002	71	2.76%	36	2.16%	35	3.84%
2003	86	3.34%	47	2.82%	39	4.28%
2004	83	3.22%	41	2.46%	42	4.61%
2005	67	2.60%	33	1.98%	34	3.73%
2006	90	3.49%	28	1.68%	62	6.81%
2007	74	2.87%	18	1.08%	56	6.15%
2008	44	1.71%	18	1.08%	26	2.85%
2009	44	1.71%	22	1.32%	22	2.41%
Total	2,576	100.00%	1,665	100.00%	911	100.00%

Table continues on the next page

Table I. (Continued)

Panel E: Distribution by Fama-French 48 industries

	ALL		STOCK		CASH	
	N	%	N	%	N	%
Agriculture	5	0.19%	4	0.20%	1	0.11%
Food Products	16	0.62%	8	0.40%	8	0.88%
Tobacco Products	0	0.00%	0	0.00%	0	0.00%
Recreation	12	0.47%	7	0.35%	5	0.55%
Entertainment	18	0.70%	11	0.55%	7	0.77%
Printing and Publishing	17	0.66%	3	0.15%	14	1.54%
Consumer Goods	27	1.05%	10	0.50%	17	1.87%
Apparel	14	0.54%	4	0.20%	10	1.10%
Healthcare	45	1.75%	37	1.86%	8	0.88%
Medical Equipment	68	2.64%	42	2.11%	26	2.85%
Pharmaceutical Products	113	4.39%	76	3.82%	37	4.06%
Chemicals	26	1.01%	8	0.40%	18	1.98%
Rubber and Plastic Products	12	0.47%	3	0.15%	9	0.99%
Textiles	6	0.23%	1	0.05%	5	0.55%
Construction Materials	24	0.93%	6	0.30%	18	1.98%
Construction	8	0.31%	4	0.20%	4	0.44%
Steel Works Etc.	24	0.93%	10	0.50%	14	1.54%
Fabricated Products	3	0.12%	0	0.00%	3	0.33%
Machinery	59	2.29%	29	1.46%	30	3.29%
Electrical Equipment	17	0.66%	9	0.45%	8	0.88%
Automobiles and Trucks	23	0.89%	5	0.25%	18	1.98%
Aircraft	8	0.31%	2	0.10%	6	0.66%
Shipbuilding, Railroad Equipment	3	0.12%	2	0.10%	1	0.11%
Defense	4	0.16%	2	0.10%	2	0.22%
Precious Metals	5	0.19%	5	0.25%	0	0.00%
Non-Metallic and Ind. Metal Mining	2	0.08%	0	0.00%	2	0.22%
Coal	1	0.04%	1	0.05%	0	0.00%
Petroleum and Natural Gas	57	2.21%	40	2.01%	17	1.87%
Utilities	59	2.29%	43	2.16%	16	1.76%
Communication	78	3.03%	55	2.76%	23	2.52%
Personal Services	13	0.50%	6	0.30%	7	0.77%
Business Services	335	13.00%	221	11.10%	114	12.51%
Computers	141	5.47%	82	4.12%	59	6.48%
Electronic Equipment	134	5.20%	91	4.57%	43	4.72%
Measuring and Control Equipment	55	2.14%	24	1.21%	31	3.40%
Business Supplies	21	0.82%	10	0.50%	11	1.21%
Shipping Containers	6	0.23%	3	0.15%	3	0.33%
Transportation	37	1.44%	11	0.55%	26	2.85%
Wholesale	57	2.21%	28	1.41%	29	3.18%
Retail	73	2.83%	38	1.91%	35	3.84%
Restaurants, Hotels, Motels	36	1.40%	23	1.16%	13	1.43%
Banking	726	28.18%	591	29.68%	135	14.82%
Insurance	76	2.95%	46	2.31%	30	3.29%
Real Estate	7	0.27%	2	0.10%	5	0.55%
Trading	90	3.49%	53	2.66%	37	4.06%
Almost Nothing	15	0.58%	9	0.45%	6	0.66%
Total	2,576	100.00%	1,991	100.00%	911	100.00%

Table II. SEO sample descriptive statistics

The table presents sample descriptive statistics for a sample of successful SEOs by US issuers over the period between January 1, 1985 and December 31, 2009 drawn from the Thomson Financial SDC New Issues Database. All variables are defined in the Appendix. Panel A describes the variables, Panel B presents the yearly composition, and Panel C the industry composition of the sample. N denotes the number of observations. Dollar values are inflation-adjusted to the level of 2009 using the US GDP deflator. All continuous variables are winsorized at the 1st and 99th percentiles.

Panel A: Variables summary statistics

	N	MEAN	SD	MIN	P25	MEDIAN	P75	MAX
MARCAP ($mil.)	3,212	593.483	1,155.259	13.146	110.682	234.504	547.039	8,350.534
BEME	3,212	0.354	0.302	-0.086	0.154	0.280	0.467	1.849
RUN-UP	3,212	0.680	1.039	-0.545	0.074	0.382	0.926	5.858
SIGMA	3,212	0.036	0.017	0.009	0.024	0.033	0.043	0.099
LEVERAGE	3,212	0.227	0.203	0.000	0.036	0.189	0.374	0.817
CASH HOLD	3,212	0.212	0.257	0.000	0.024	0.091	0.321	0.929
OPER PERFORM	3,212	0.059	0.227	-0.974	0.029	0.114	0.175	0.407
CF/EQ	3,212	0.041	0.126	-0.529	0.007	0.056	0.100	0.383
DEAL VALUE ($mil.)	3,212	82.370	96.009	4.223	27.878	53.718	97.493	655.529
RELSIZE	3,212	0.266	0.200	0.024	0.134	0.217	0.336	1.207
PRIMARY	3,212	0.562	0.496	0	0	1	1	1
COMBINED	3,212	0.438	0.496	0	0	0	1	1
ACAR	3,212	-3.155%	7.510%	-25.235%	-7.339%	-3.049%	0.951%	20.344%

Panel B: Distribution by year

Year	N	%
1985	158	4.92%
1986	168	5.23%
1987	125	3.89%
1988	50	1.56%
1989	98	3.05%
1990	84	2.62%
1991	245	7.63%
1992	201	6.26%
1993	247	7.69%
1994	143	4.45%
1995	273	8.50%
1996	278	8.66%
1997	226	7.04%
1998	117	3.64%
1999	99	3.08%
2000	106	3.30%
2001	60	1.87%
2002	82	2.55%
2003	107	3.33%
2004	79	2.46%
2005	65	2.02%
2006	64	1.99%
2007	42	1.31%
2008	33	1.03%
2009	62	1.93%
Total	3,212	100.00%

Table continues on the next page

Table II. (Continued)

Panel C: Distribution by Fama-French 48 industries

	N	%
Agriculture	10	0.31%
Food Products	19	0.59%
Candy & Soda	0	0.00%
Beer & Liquor	0	0.00%
Recreation	30	0.93%
Entertainment	35	1.09%
Printing and Publishing	11	0.34%
Consumer Goods	36	1.12%
Apparel	26	0.81%
Healthcare	128	3.99%
Medical Equipment	126	3.92%
Pharmaceutical Products	309	9.62%
Chemicals	33	1.03%
Rubber and Plastic Products	27	0.84%
Textiles	10	0.31%
Construction Materials	28	0.87%
Construction	38	1.18%
Steel Works Etc.	52	1.62%
Fabricated Products	0	0.00%
Machinery	83	2.58%
Electrical Equipment	31	0.97%
Automobiles and Trucks	39	1.21%
Aircraft	9	0.28%
Shipbuilding, Railroad Equipment	3	0.09%
Defense	3	0.09%
Precious Metals	7	0.22%
Non-Metallic and Ind. Metal Mining	0	0.00%
Coal	2	0.06%
Petroleum and Natural Gas	144	4.48%
Utilities	219	6.82%
Communication	57	1.77%
Personal Services	31	0.97%
Business Services	372	11.58%
Computers	151	4.70%
Electronic Equipment	261	8.13%
Measuring and Control Equipment	59	1.84%
Business Supplies	12	0.37%
Shipping Containers	1	0.03%
Transportation	91	2.83%
Wholesale	118	3.67%
Retail	172	5.35%
Restaurants, Hotels, Motels	112	3.49%
Banking	171	5.32%
Insurance	61	1.90%
Real Estate	4	0.12%
Trading	44	1.37%
Almost Nothing	37	1.15%
Total	3,212	100.00%

Table III. Cross-sectional OLS regression of ICARs, probit regression of equity issuance choice, and predicted (matched) HCARs

Panel A of the table presents estimation results of a cross-sectional OLS regression of issuer CAR (*ICAR*) on issuer and offer characteristics common to both seasoned equity issuers and stock acquirers (Specification (1)). It also reports estimation results of a probit regression of a choice between issuing stock via a stock-financed acquisition and an SEO using the same explanatory variables (Specification (2)). Panel B presents hypothetical SEO returns (*HCAR*) for sample stock acquirers estimated via linear prediction based on the parameter estimates of (1), and via propensity-score matching with the propensity score based on the estimation results of (2). All variables are defined in the Appendix. The *t*-statistics (*Z*-statistics for the probit regression) are based on heteroskedasticity-robust standard errors clustered at the firm-level. Symbols a, b, and c denote statistical significance at the 1%, 5%, and 10% level, respectively. N denotes number of observations. Panel C presents matching diagnostics for the propensity-score matching methodology. *% |Diff|* is the absolute difference in means for stock acquirers and SEO firms, as percentage of the former. *% Δ |Diff|* is the achieved percentage reduction in the absolute difference in means for stock acquirers and SEO firms resulting from matching (negative values indicate increases in differences). The *p*-values for the differences in means for the two samples are also presented.

Panel A: Estimation results	ICAR (1)	STOCK DEAL/SEO (2)
INTERCEPT	-0.0700[a]	-3.7337[a]
	(-3.20)	(-7.64)
LN (MARCAP)	0.0053[a]	0.5131[a]
	(3.78)	(19.66)
BEME	0.0062	0.3505[a]
	(0.98)	(3.05)
RUN-UP	-0.0073[a]	-0.6281[a]
	(-3.94)	(-12.15)
SIGMA	-0.3550[b]	1.9037
	(-2.34)	(0.66)
RELSIZE	0.0547[a]	1.9757[a]
	(4.93)	(16.54)
LEVERAGE	0.0048	-1.0005[a]
	(0.57)	(-5.91)
CASH HOLD	-0.0093	-0.5382[a]
	(-1.01)	(-3.33)
CF/EQ	-0.0183	-0.6006[c]
	(-1.08)	(-1.83)
OPER PERFORM	-0.0023	-0.1718
	(-0.22)	(-0.94)
YEAR FE	YES	YES
INDUSTRY FE	YES	YES
N	3,227	4,877
R2 (ADJ. R2) [PSEUDO R2]	0.067 (0.043)	[0.442]

Panel B: Predicted (matched) values	Linear prediction	One-to-one	10 nearest	50 nearest
N	1,665	1,665	1,665	1,665
MEAN	-1.27%	-3.19%	-2.53%	-2.54%
SD	2.34%	7.73%	2.02%	0.77%
MIN	-6.84%	-23.79%	-8.18%	-4.78%
P25	-2.70%	-6.04%	-3.88%	-2.68%
MEDIAN	-1.48%	-3.06%	-2.19%	-2.68%
P75	-0.18%	0.74%	-1.62%	-2.36%
MAX	6.45%	20.34%	3.01%	0.16%

Table continues on the next page

Table III. (Continued)

Panel C: Matching diagnostics		Stock-financed M&As	Unmatched SEOs	One-to-one	10 nearest	50 nearest
LN (MARCAP)	Mean	7.007	5.530	6.792	6.580	6.529
	% |Diff|		21.074	3.075	6.094	6.825
	% Δ |Diff|		N/A	85.407	71.084	67.617
	p-val		0.000	0.001	0.000	0.000
BEME	Mean	0.435	0.354	0.546	0.605	0.607
	% |Diff|		18.569	25.604	38.992	39.659
	% Δ |Diff|		N/A	-37.890	-109.993	-113.583
	p-val		0.000	0.000	0.000	0.000
RUN-UP	Mean	0.182	0.680	0.153	0.138	0.136
	% |Diff|		273.221	16.026	24.420	25.555
	% Δ |Diff|		N/A	94.135	91.062	90.647
	p-val		0.000	0.123	0.020	0.016
SIGMA	Mean	0.029	0.036	0.035	0.038	0.039
	% |Diff|		22.059	18.536	31.293	32.798
	% Δ |Diff|		N/A	15.969	-41.860	-48.682
	p-val		0.000	0.000	0.000	0.000
RELSIZE	Mean	0.345	0.266	0.289	0.338	0.307
	% |Diff|		23.027	16.377	2.056	11.110
	% Δ |Diff|		N/A	28.882	91.073	51.754
	p-val		0.000	0.000	0.589	0.002
LEVERAGE	Mean	0.178	0.227	0.175	0.186	0.184
	% |Diff|		27.395	1.665	4.215	2.999
	% Δ |Diff|		N/A	93.923	84.612	89.053
	p-val		0.000	0.603	0.179	0.343
CASH HOLD	Mean	0.162	0.212	0.157	0.161	0.157
	% |Diff|		30.430	3.417	1.108	3.324
	% Δ |Diff|		N/A	88.772	96.358	89.075
	p-val		0.000	0.433	0.800	0.443
OPER PERFORM	Mean	0.062	0.059	0.046	0.048	0.055
	% |Diff|		5.369	24.919	22.817	10.657
	% Δ |Diff|		N/A	-364.157	-325.000	-98.494
	p-val		0.589	0.002	0.009	0.230
CF/EQ	Mean	0.032	0.041	0.015	-0.025	0.004
	% |Diff|		25.787	52.529	175.787	88.248
	% Δ |Diff|		N/A	-103.708	-581.699	-242.225
	p-val		0.033	0.001	0.000	0.000
PROPENSITY SCORE	Mean	0.679	0.173	0.678	0.674	0.637
	% |Diff|		74.593	0.144	0.807	6.223
	% Δ |Diff|		N/A	99.807	98.918	91.657
	p-val		0.000	0.924	0.589	0.000

Table IV. Comparisons of ACARs, HCARs, and PCARs

The table presents univariate comparisons of mean and median *ACARs*, *HCARs*, and *PCARs*. All variables are defined in the Appendix. Numbers in parentheses are *p*-values (significance tests are 2-tailed). N denotes the number of observations.

	Conventional	Linear		One-to-one		10 nearest		50 nearest	
	ACAR	HCAR	PCAR	HCAR	PCAR	HCAR	PCAR	HCAR	PCAR
All (1)									
Mean	-1.31%	-1.27%	-0.48%	-3.19%	0.77%	-2.53%	0.33%	-2.54%	0.32%
	(0.000)	(0.000)	(0.002)	(0.000)	(0.000)	(0.000)	(0.031)	(0.000)	(0.033)
Median	-1.09%	-1.48%	-0.33%	-3.06%	0.41%	-2.19%	0.41%	-2.68%	0.34%
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.011)	(0.000)	(0.011)
N	2,576	1,665	2,576	1,665	2,576	1,665	2,576	1,665	2,576
Cash (2)									
Mean	0.50%	N/A	0.50%	N/A	0.50%	N/A	0.50%	N/A	0.50%
	(0.019)	N/A	(0.019)	N/A	(0.019)	N/A	(0.019)	N/A	(0.019)
Median	0.15%	N/A	0.15%	N/A	0.15%	N/A	0.15%	N/A	0.15%
	(0.237)	N/A	(0.237)	N/A	(0.237)	N/A	(0.237)	N/A	(0.237)
N	911	N/A	911	N/A	911	N/A	911	N/A	911
Stock (3)									
Mean	-2.29%	-1.27%	-1.02%	-3.19%	0.91%	-2.53%	0.23%	-2.54%	0.22%
	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)	(0.000)	(0.266)	(0.000)	(0.278)
Median	-1.94%	-1.48%	-0.63%	-3.06%	0.77%	-2.19%	0.56%	-2.68%	0.46%
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.040)	(0.000)	(0.035)
N	1,665	1,665	1,665	1,665	1,665	1,665	1,665	1,665	1,665
Difference (2)-(3)									
Mean	2.80%	N/A	1.53%	N/A	-0.41%	N/A	0.28%	N/A	0.29%
	(0.000)	N/A	(0.000)	N/A	(0.300)	N/A	(0.377)	N/A	(0.357)
Median	2.09%	N/A	0.78%	N/A	-0.61%	N/A	-0.40%	N/A	-0.31%
	(0.000)	N/A	(0.000)	N/A	(0.088)	N/A	(0.499)	N/A	(0.536)

Table V. Cross-sectional regressions of PCARs and ACARs

The table presents the results of cross-sectional regression analysis of *PCARs* and *ACARs*. All variables are defined in the Appendix. The *t*-statistics are based on heteroskedasticity-robust standard errors clustered at the firm level. Symbols a, b, and c denote statistical significance at the 1%, 5%, and 10% level, respectively. N denotes the number of observations. Year and industry fixed effects (coefficients suppressed) are based on calendar year and Fama-French 48 industry classification dummies, respectively.

	Conventional ACAR	Linear PCAR	One-to-one PCAR	10 nearest PCAR	50 nearest PCAR
INTERCEPT	0.0450[a]	0.0849[a]	0.0078	0.0410[b]	0.0407[b]
	(2.63)	(4.74)	(0.32)	(2.37)	(2.56)
STOCK	-0.0211[a]	-0.0059	0.0112[b]	0.0034	0.0038
	(-5.40)	(-1.49)	(2.40)	(0.86)	(0.97)
LN (MARCAP)	-0.0023[c]	-0.0058[a]	0.0005	-0.0025[b]	-0.0023[b]
	(-1.89)	(-4.88)	(0.34)	(-2.11)	(-1.98)
BEME	0.0145[b]	0.0126[c]	0.0104	0.0137[c]	0.0141[b]
	(1.98)	(1.71)	(1.26)	(1.89)	(1.97)
RUN-UP	-0.0166[a]	-0.0107[b]	-0.0157[a]	-0.0140[a]	-0.0155[a]
	(-3.69)	(-2.35)	(-2.93)	(-3.08)	(-3.50)
SIGMA	0.2163	0.5028[b]	0.2031	0.1646	0.2114
	(0.99)	(2.33)	(0.78)	(0.76)	(0.98)
RELSIZE	-0.0095	-0.0417[a]	-0.0008	-0.0113[c]	-0.0099[c]
	(-1.63)	(-6.60)	(-0.13)	(-1.95)	(-1.72)
TENDER	0.0120[b]	0.0121[b]	0.0128[b]	0.0115[b]	0.0119[b]
	(2.46)	(2.42)	(2.43)	(2.39)	(2.45)
DIVERSIFIC	-0.0034	-0.0021	-0.0050	-0.0035	-0.0038
	(-0.86)	(-0.52)	(-1.04)	(-0.89)	(-0.96)
HOSTILE	-0.0021	0.0138	-0.0008	-0.0008	-0.0018
	(-0.17)	(0.91)	(-0.07)	(-0.07)	(-0.15)
MULTIBID	-0.0108	-0.0083	-0.0047	-0.0106	-0.0103
	(-1.20)	(-0.88)	(-0.48)	(-1.18)	(-1.16)
LEVERAGE	0.0173	0.0164	0.0202	0.0162	0.0175
	(1.41)	(1.32)	(1.42)	(1.32)	(1.43)
CASH HOLD	-0.0317[b]	-0.0249[c]	-0.0176	-0.0284[b]	-0.0295[b]
	(-2.24)	(-1.76)	(-1.05)	(-2.02)	(-2.12)
CF/EQ	-0.0569[b]	-0.0413[c]	-0.0463[c]	-0.0591[a]	-0.0538[b]
	(-2.48)	(-1.80)	(-1.85)	(-2.64)	(-2.41)
OPER PERFORM	-0.0002	0.0042	-0.0003	-0.0022	0.0013
	(-0.01)	(0.20)	(-0.01)	(-0.11)	(0.06)
YEAR FE	YES	YES	YES	YES	YES
INDUSTRY FE	YES	YES	YES	YES	YES
N	2,576	2,576	2,576	2,576	2,576
R2 (ADJ R2)	0.113 (0.084)	0.122 (0.093)	0.044 (0.013)	0.080 (0.049)	0.086 (0.056)

Table VI. Further tests and robustness checks

The table presents the results of several additional tests and robustness checks described in Section 5. Only the variable of interest, *STOCK*, and its interactions are reported. All other independent variables are identical to those in respective specifications of Table V (except for Panel A where year dummies are omitted) and are defined in the Appendix. The *t*-statistics are based on heteroskedasticity-robust standard errors clustered at the firm level. Symbols a, b, and c denote statistical significance at the 1%, 5%, and 10% level, respectively. N denotes the number of observations.

	Conventional ACAR	Linear PCAR	One-to-one PCAR	10 nearest PCAR	50 nearest PCAR
Panel A: Wealth destruction of 1998-2001					
STOCK	-0.0167[a]	-0.0039	0.0132[a]	0.0079[c]	0.0081[b]
	(-4.11)	(-0.93)	(2.74)	(1.93)	(2.02)
98-2001	0.0047	0.0026	0.0088	0.0052	0.0048
	(0.71)	(0.39)	(1.30)	(0.78)	(0.73)
STOCK X 98-2001	-0.0145[c]	-0.0126	-0.0115	-0.0142[c]	-0.0142[c]
	(-1.86)	(-1.60)	(-1.31)	(-1.82)	(-1.83)
Panel B: Overvaluation-driven acquisitions (Fu et al., 2013)					
Absolute and Relative Overvaluation					
STOCK	-0.0217[a]	-0.0096[c]	0.0065	0.0010	0.0026
	(-3.95)	(-1.77)	(1.00)	(0.17)	(0.47)
OV DUMMY	-0.0057	-0.0024	0.0012	-0.0037	-0.0048
	(-1.05)	(-0.44)	(0.16)	(-0.68)	(-0.89)
Relative Overvaluation					
STOCK	-0.0207[a]	-0.0089	0.0076	0.0019	0.0039
	(-3.49)	(-1.53)	(1.10)	(0.32)	(0.67)
ROV	0.0075	0.0066	0.0077	0.0077	0.0077
	(1.53)	(1.36)	(1.53)	(1.63)	(1.62)
ROV X STOCK	-0.0064	-0.0034	-0.0013	-0.0047	-0.0064
	(-1.01)	(-0.53)	(-0.18)	(-0.75)	(-1.03)
Panel C: Governance interactions					
STOCK	-0.0142	0.0023	0.0085	0.0106	0.0101
	(-1.63)	(0.27)	(0.84)	(1.22)	(1.17)
LEVERAGE X STOCK	-0.0058	-0.0253	-0.0022	-0.0082	-0.0058
	(-0.25)	(-1.04)	(-0.08)	(-0.35)	(-0.25)
CF/EQ X STOCK	-0.0165	-0.0011	-0.0034	-0.0160	-0.0103
	(-0.37)	(-0.02)	(-0.07)	(-0.36)	(-0.23)
CASH HOLD X STOCK	-0.0492[b]	-0.0321	-0.0217	-0.0482[b]	-0.0485[b]
	(-2.00)	(-1.31)	(-0.79)	(-1.98)	(-2.00)
OPER PERFORM X STOCK	-0.0352	-0.0327	-0.0154	-0.0360	-0.0345
	(-0.93)	(-0.85)	(-0.38)	(-0.96)	(-0.92)
IND COMP X STOCK	0.1197	0.1201	0.1725	0.1245	0.1187
	(1.02)	(1.01)	(1.23)	(1.06)	(1.02)
Panel D: Estimation (SEO) sample restricted to issues for "general corporate purposes"					
STOCK	-0.0211[a]	-0.0053	0.0090[b]	0.0065[c]	0.0087[b]
	(-5.40)	(-1.35)	(2.01)	(1.65)	(2.24)
Panel E: Estimation (SEO) sample restricted to equity-for-debt exchange offers					
STOCK	-0.0193[a]	-0.005	-0.0272[a]	-0.0004	0.0116[a]
	(-4.61)	(-1.17)	(-5.20)	(-0.10)	(2.81)

Table continues on the next page

Table VI. (Continued)

Panel F: Decomposing *ACAR* for cash deals using hypothetical bond issue returns					
STOCK	-0.0211[a]	-0.0099[b]	0.0174[a]	0.0130[a]	0.0058
	(-5.40)	(-2.49)	(3.50)	(3.22)	(1.48)
Panel G: Price pressure effects (Mitchell et al., 2004)					
Deal Value at least $10M (n=2,439)					
STOCK	-0.0185[a]	-0.0023	0.0146[a]	0.0060	0.0061
	(-4.51)	(-0.56)	(2.95)	(1.45)	(1.48)
IMPACT	0.0187[a]	0.0263[a]	0.0189[a]	0.0194[a]	0.0189[a]
	(3.19)	(3.59)	(3.14)	(3.31)	(3.22)
STOCK X IMPACT	-0.0176[a]	-0.0295[a]	-0.0200[b]	-0.0186[a]	-0.0177[a]
	(-2.69)	(-3.77)	(-2.53)	(-2.77)	(-2.71)
Deal Value at least $100M (n=1,454)					
STOCK	-0.0219[a]	-0.0121[b]	0.0123[c]	0.0020	0.0028
	(-3.92)	(-2.16)	(1.82)	(0.36)	(0.50)
IMPACT	0.0204[b]	0.0317[a]	0.0197[b]	0.0216[b]	0.0209[b]
	(2.26)	(2.70)	(2.32)	(2.44)	(2.31)
STOCK X IMPACT	-0.0432[a]	-0.0672[a]	-0.0302[b]	-0.0430[a]	-0.0439[a]
	(-4.10)	(-5.17)	(-2.47)	(-4.21)	(-4.20)

Table VII. Cross-sectional regressions of PCARs and ACARs - private deals

The table presents the results of cross-sectional regression analysis of *PCARs* and *ACARs* for private firm acquisitions (stand-alone private and subsidiary firms). All variables are defined in the Appendix. The *t*-statistics are based on heteroskedasticity-robust standard errors clustered at the firm level. Symbols a, b, and c denote statistical significance at the 1%, 5%, and 10% level, respectively. N denotes the number of observations. Year and industry fixed effects (coefficients suppressed) are based on calendar year and Fama-French 48 industry classification dummies, respectively.

	Conventional ACAR	Linear PCAR	One-to-one PCAR	10 nearest PCAR	50 nearest PCAR
INTERCEPT	0.0037	0.0238	-0.0054	0.0048	0.0046
	(0.17)	(0.71)	(-0.20)	(0.21)	(0.21)
STOCK	0.0058[c]	-0.0018	0.0148[a]	0.0037	0.0025
	(1.96)	(-0.57)	(4.08)	(1.23)	(0.84)
LN (MARCAP)	-0.0030[a]	-0.0009	-0.0014	-0.0032[a]	-0.0031[a]
	(-2.93)	(-0.86)	(-1.18)	(-3.12)	(-3.03)
BEME	0.0013	-0.0031	-0.0009	0.0009	0.0016
	(0.24)	(-0.56)	(-0.15)	(0.17)	(0.30)
RUN-UP	-0.0071[b]	-0.0015	-0.0084[a]	-0.0067[b]	-0.0067[b]
	(-2.46)	(-0.54)	(-2.67)	(-2.35)	(-2.33)
SIGMA	0.1070	0.1962	0.1155	0.0942	0.1119
	(0.80)	(1.46)	(0.78)	(0.70)	(0.83)
RELSIZE	0.0499[a]	0.0132[b]	0.0599[a]	0.0490[a]	0.0491[a]
	(8.28)	(2.11)	(9.54)	(8.19)	(8.20)
TENDER	0.1086[a]	0.1039[a]	0.1109[a]	0.1021[b]	0.1077[a]
	(2.75)	(2.72)	(2.73)	(2.49)	(2.75)
DIVERSIFIC	0.0043	0.0024	0.0049	0.0041	0.0045[c]
	(1.63)	(0.91)	(1.61)	(1.55)	(1.69)
HOSTILE	-0.1680[a]	-0.1342[a]	-0.1714[a]	-0.1617[a]	-0.1659[a]
	(-7.17)	(-5.54)	(-6.60)	(-6.97)	(-7.26)
MULTIBID	0.0193	0.0184	0.0249	0.0259	0.0192
	(1.20)	(1.02)	(1.45)	(1.53)	(1.21)
LEVERAGE	-0.0005	-0.0016	-0.0041	-0.0008	0.0002
	(-0.07)	(-0.20)	(-0.46)	(-0.10)	(0.02)
CASH HOLD	0.0019	-0.0046	0.0053	0.0003	0.0011
	(0.21)	(-0.50)	(0.53)	(0.03)	(0.12)
CF/EQ	0.0066	0.0223	0.0094	0.0030	0.0065
	(0.36)	(1.22)	(0.46)	(0.16)	(0.36)
OPER PERFORM	-0.0087	-0.0048	0.0107	-0.0061	-0.0096
	(-0.62)	(-0.34)	(0.66)	(-0.43)	(-0.68)
YEAR FE	YES	YES	YES	YES	YES
INDUSTRY FE	YES	YES	YES	YES	YES
N	6,329	6,329	6,329	6,329	6,329
R2 (ADJ R2)	0.074 (0.062)	0.036 (0.023)	0.071 (0.059)	0.072 (0.059)	0.074 (0.061)