

## How do serial acquirers choose the method of payment?

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### Abstract

We show that serial acquirers appear to strategically shift between methods of payment in acquisitions based on changes in their own characteristics. In particular, they attempt to take advantage of their overvalued stock in making stock-financed acquisitions. Acquirer overvaluation significantly affects acquisition dynamics, increasing the speed to the next acquisition and affecting the propensity to pay with stock. Target overvaluation and uncertainty does not appear to play a significant role in the acquirer's choice of payment method, suggesting that avoiding the winner's curse is at best a secondary consideration for buyers.

**Keywords:** Serial acquirers; Methods of payment; Firm characteristics

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## 1. Introduction

The academic literature has traditionally argued that there are three main drivers of returns to acquirers in mergers and acquisitions: misvaluation of the acquirer's shares, misvaluation of the target's shares, and the net present value (NPV) generated by the transaction. Of these, only the first two drivers are directly related to the method of payment used by acquirers.<sup>1</sup>

The *acquirer misvaluation* hypothesis (Shleifer and Vishny, 2003; Baker, Stein, and Wurgler, 2003) focuses on the *acquirer* and suggests that rational managers take advantage of irrational market misvaluations by paying for acquisitions using stock when their own stock is overvalued. The acquirer's preference to use stock benefits the acquirer's shareholders if the acquirer is more overvalued than the target. Rhodes-Kropf, Robinson, and Viswanathan (RRV) (2005) decompose the acquirer's market to book ratio into three components: the firm-specific pricing deviation from short-run industry pricing; sector-wide, short-run deviations from firms' long-run pricing; and long-run pricing, and show that acquirer misvaluation tilts the method of payment towards stock when acquirers who have low long-run value-to-book ratios but are otherwise overvalued, buy high long-run value-to-book targets. Similarly, Savor and Lu (2009) examine firms that fail for exogenous reasons and find that unsuccessful stock bidders significantly underperform relative to successful ones. They argue that stock bidders may be worse off if they do not consummate the merger since they would have been paying with overvalued shares.

The *winner's curse* hypothesis argues that payment with stock is optimal for the acquirer when it can mitigate the winner's curse. A winner's curse situation can arise under three scenarios, all of which are related to *target* characteristics: when the target is overvalued, when asymmetric information creates uncertainty about the target's value, and when there is a high degree of competition for acquiring the target. In order to mitigate the winner's curse, Martin (1996) and Hansen (1987) argue that stock should be used as the method of payment when information asymmetry about the target's value is high. Boone and Mulherin (2008) posit that

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<sup>1</sup> The neoclassical efficiency hypothesis (see Gort, 1969, for example) argues that managers undertake corporate transactions for efficiency reasons, buying targets to take advantage of growth opportunities or to invest in positive NPV projects. Consequently, returns to acquirers will be driven by the market's perception of the NPV of the transaction. The method of payment should not matter.

the acquirer's return in an acquisition is inversely related to the uncertainty in the target's value (see also Bazerman and Samuelson, 1983). Officer, Poulsen, and Stegemoller (2009) also find that announcement returns for acquirers are significantly less negative in stock swaps when idiosyncratic return volatility, their proxy for uncertainty is higher for the target than the acquirer. Furthermore, motivated by Kagel and Levin (1986), both Boone and Mulherin (2008) and Aktas, de Bodt, and Roll (2010) control for the method of payment in their models on the offer bid premium and find a significant negative coefficient for stock payments, suggesting that acquirers take potential competition into account when bidding for a target. Aktas, de Bodt, and Roll (2010) find that latent competition increases the acquisition premium and that the expected cost of an auction reduces the premium.

Despite extensive research, it has proven difficult to assess the relative importance of the two hypotheses. Most studies focus only on one of the two, treating each acquisition as a one-off deal. However, if an acquirer makes only one acquisition in its life and never returns to the market for a second acquisition, will it necessarily learn enough about the winner's curse to know when it should pay in stock? Similarly, is it likely to learn about its own degree of overvaluation to assess the relative benefit of a stock over a cash payment?

In this paper, we attempt to disentangle the two hypotheses by examining how the method of payment relates to the characteristics of targets acquired by *serial* acquirers, using data on more than 21,000 acquisitions of U.S. targets by U.S. publicly listed acquirers during 1980-2010. More specifically, we analyze three types of serial acquirers: Serial acquirers that pay cash in all their deals (serial cash-only acquirers), serial acquirers that pay in stock in all their deals (serial stock-only acquirers), and serial acquirers that switch between methods of payment and conduct both cash and stock deals (serial switchers). Our classification of cash-only and stock-only acquirers is *ex post*. *Ex ante*, these acquirers also face the same switching decision on every subsequent acquisition but choose to retain the same method of payment in subsequent deals.

Studying serial acquirers is appropriate for three reasons. First, by their very nature, serial acquirers return to the market several times to make acquisitions, and have opportunities to learn the optimal bidding strategy. Aktas, de Bodt, and Roll (2011) report that CEOs take investor

reactions to their previous deals into account and adjust their bidding behavior accordingly. Their results are consistent with CEOs of serial acquirers learning how to acquire over time.

Second, serial acquirers are ubiquitous. As Fuller, Netter and Stegemoller (2002) note serial acquirers initiate a significant proportion of takeover activity. In their sample, serial acquirers conduct over one-third of all large, non-financial, non-utility takeovers in the United States during 1990-2000. Over the 1980-2010 period, our evidence suggests that serial acquirers are even more dominant. Half of all acquirers in our sample are serial acquirers – conducting more than one acquisition in the space of three years – and these serial acquirers conduct 78% of all acquisitions by number and 85% by value.

Third and most important, most serial acquirers use different methods of payment from one acquisition to the next. Most serial acquirers in our sample are serial switchers – that is, they switch method of payment from cash to stock and vice versa (36% of all acquisitions by number and 56% by value). This is even more pronounced among acquirers that purchase publicly listed targets (50% of all acquisitions by number and 71% by value). Serial acquirers that switch between methods of payment also conduct the largest deals on average. This gives us an opportunity to disentangle the acquirer misvaluation effect from the winner's curse effects. More precisely, if an acquirer announces two acquisitions close together in calendar time and chooses to pay for one with cash and the other with stock, then the misvaluation of the acquirer is unlikely to be driving the choice of payment. Contrasting the target characteristics for the two mergers clarifies the importance of the winner's curse hypothesis. In contrast, an acquirer who makes two acquisitions far apart in calendar time using different methods of payment for similar targets is likely to be choosing the method of payment based on changes in its own characteristics. Moreover, examining serial acquisitions enables us to assess the impact of overvaluation in the acquisition dynamics, such as the timing of subsequent acquisitions.

Our empirical analysis of acquirer and target characteristics is divided in two parts, namely (i) an analysis of the unconditional choice of cash or stock as method of payment for all serial acquirers, and (ii) an analysis of the decision to *switch* from one method of payment to another for serial switchers conditional on their previous choices. We conduct a series of tests in both a univariate and a multivariate framework. We distinguish our results from Fuller, Netter, and Stegemoller (2002) by noting that rather than investigating the returns earned by acquiring

shareholders, we investigate the characteristics of acquirers and targets that determine the method of payment and how these characteristics impact acquisition dynamics in serial acquisitions.

The first part of our analysis examines the unconditional choice of cash or stock payments for all serial acquirers. It consists of three main series of tests. First, we analyze whether there are systematic differences in acquirer and target characteristics between cash and stock acquisitions. We find consistently significant differences between firms that choose to pay with stock and firms that choose to pay with cash, whether we consider different firms (cash-only and stock-only serial acquirers) or the same firm making acquisitions at different points in time (cash and stock acquisitions of serial switchers). Cash acquirers typically have higher debt, better operating performance (especially net income margin), and operate in industries with larger standard deviations of Tobin's Q. Stock acquirers earn higher stock returns prior to the deal (though with a larger standard deviation of stock returns during the prior year), are characterized by higher potential misvaluation (as proxied by the RRV firm-specific error and Tobin's Q), and operate in industries with higher sector-specific error. Differences in target characteristics between stock and cash acquisitions do not display the same level of consistency. Many results of target characteristics lose significance and sometimes reverse when we compare stock to cash acquisitions made by serial switchers and cash-only and stock-only acquirers. These results suggest that acquirer characteristics are more important than target characteristics in determining the method of payment in an acquisition.

Second, we analyze patterns in acquirer and target overvaluation proxies, competition levels, auction costs, and the level of uncertainty of the target for cash relative to stock acquisitions. Using different proxies, we find that acquirers paying with stock appear consistently overvalued relative to those paying with cash. This result holds when we compare cash to stock acquisitions of serial switchers and when we compare the average cash to the average stock acquisition by cash-only and stock-only serial acquirers. However differences in target overvaluation are not consistently significant when we examine cash and stock deals. We also find that the acquirer's *relative* overvaluation matters more than the target's relative overvaluation for the method of payment decision. Levels of competition, auction costs, and proxies for the level of uncertainty of the target also do not seem to play a role in the method of payment decision of the acquirer. On the contrary, we find some evidence that acquirers prefer to

pay with cash for highly uncertain targets. All these results point away from the winner's curse hypothesis.

Finally, we conclude this first part of our analysis by examining the excess stock price performance of the acquirer to determine whether acquirers are worse off if they should have paid stock (because the target was overvalued) but did not (because the acquirer was not overvalued). Acquirers seem better off by paying with stock when their stock is overvalued. However, we do not find evidence to support the conjecture that acquirers are worse off when they pay with stock if the target's overvaluation is higher than the acquirer's overvaluation. We also find that acquirers benefit from paying with cash regardless of the target's high overvaluation or uncertainty. These findings are inconsistent with the predictions from the winner's curse hypothesis.

The second part of our analysis examines the decision to *switch* from one form of payment to another for serial switchers conditional on their previous choices. We examine both close acquisitions (announced within a year of each other) and distant acquisitions (announced over a year apart). If there is any evidence for the winner's curse hypothesis, it is likely to show up mainly in the close acquisitions, since acquirer characteristics are not likely to change over short time frames. We show that a significant proportion of acquirers switch methods of payment in close acquisitions, though not surprisingly the shift is more likely in distant acquisitions. For close acquisitions, 40% of serial switchers switch from stock in one acquisition to cash in the next, while 32% go the other way from cash to stock. For distant acquisitions, the numbers rise to 64% and 41% respectively. The higher sensitivity of switching from stock into cash (as opposed to from cash into stock) suggests that the window of opportunity of doing stock deals may be shorter compared to cash deals, in line with the acquirer misvaluation hypothesis.

Characteristics that are significant in distinguishing cash from stock payments in general are also significant in explaining when serial acquirers switch between methods of payment. Overall, firms switch when the relative advantage of one type of payment increases relative to the other. However, these relative advantages are largely based on changes in *acquirer* characteristics. Firms that experience a reduction in cash balances switch into paying stock (or are serial stock acquirers in the first place). Firms whose stock prices and/or firm-specific errors increase the most switch from paying in cash to paying in stock. In contrast, firms whose stock

prices and/or firm-specific errors decline the most switch from paying in stock to paying in cash (or are serial cash acquirers in the first place). Therefore, serial switchers appear to be taking advantage of market opportunities based on their own characteristics. Regardless of how we cut the sample, we find little evidence that target firm characteristics, competition levels, or target uncertainty play a significant role in the switching decision, when compared to changes in acquirer characteristics.

Finally, we assess whether overvalued acquirers make subsequent acquisitions faster when using stock. Duration analysis provides evidence that acquirers seem to take advantage of temporary overvaluation, consistent with predictions of the acquirer misvaluation hypothesis. We find that acquirer overvaluation accelerates the event of a subsequent stock acquisition (over a subsequent cash acquisition). In addition, the hazard rate of paying with stock is also significantly higher when the acquirer's overvaluation is higher.

Overall, we conclude that our evidence is most consistent with the hypothesis that acquirers strategically switch between methods of payment based on changes in their own characteristics. In particular, they attempt to take advantage of their overvalued share values in making stock-financed acquisitions. Target overvaluation does not appear to play a significant role in the acquirer's choice of payment method, suggesting that avoiding a winner's curse is at best a secondary consideration for buyers. Our results are robust to using different lengths for classifying acquisitions into serial blocks, and different thresholds for classifying the method of payment as cash or stock.

The remainder of the paper is organized as follows. Section 2 discusses our data and methodology. Sections 3-4 report results for the first and second part of our empirical analysis respectively. Section 5 reports robustness tests. Section 6 concludes.

## **2. Data and descriptive statistics**

We obtain our sample by searching the Thomson One (SDC) database for acquisitions of U.S. targets (public, private and subsidiary firms) announced by U.S. public acquirers during 1980-2010. We require that the bidder seeks to acquire more than 50% ownership of the target, that the relative size of the target is at least 1% of the acquirer, that SDC reports the method of payment, and that the Center for Research in Security Prices (CRSP) and COMPUSTAT provide

information for the acquirer. We obtain stock return and accounting data for the universe of U.S. publicly listed firms from CRSP and COMPUSTAT as of the prior quarter before the announcement date. Our initial sample consists of 21,123 transactions.

We classify an acquisition as a cash (stock) acquisition if the percentage payment in cash (stock) exceeds 80% of the total consideration. Following Fuller, Netter and Stegemoller (2002), we then classify an acquisition as part of a serial block of acquisitions (i.e., as a serial acquisition) if the acquirer has made a prior acquisition within 3 years of the current acquisition. We use three classifications for the acquisitions within a serial block of acquisitions. Specifically, the acquirer is classified as a serial cash (stock) acquirer if the percentage payment in cash (stock) is greater than 80% in all the acquisitions in the serial block. An acquirer is classified as a serial switcher if it announces both cash and stock acquisitions within the serial block.<sup>2</sup>

Table 1 reports the frequency and size of acquisitions in our sample. Panel A describes the entire sample and Panel B the subsample of acquisitions for which firm characteristics for the target are available.<sup>3</sup> Serial acquirers conduct the vast majority of acquisitions, both in quantity and in transaction value. Specifically, 3,309 serial acquirers (51.8% of the 6,394 acquirers in our sample) conduct 77.8% of all the 21,123 acquisitions. Because the average transaction value of the serial acquisitions (\$267 million) is larger than the overall average (\$245 million), serial acquisitions make up 84.4% of the total value of acquisitions. The average length of a serial block is 4.3 years, with an average of 8.6 acquisitions in a serial block. The shorter average block length for serial stock acquisitions (2.1 years) suggests that acquirers may be attempting to take advantage of short lived economic or firm-specific opportunities when choosing to pay with stock.

When we compare the three types of serial acquirers based on the method of payment, we find that 28.5% of all acquirers consistently use cash as the sole method of payment in serial acquisitions, 20.2% switch between cash and stock, while only 7.2% systematically use stock as their sole method of payment. Serial switchers conduct approximately the same number of

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<sup>2</sup> In robustness tests, we show that our main analyses are robust to (i) using 2 or 5 years when classifying blocks of serial acquisitions, and (ii) using a 60% or 100% threshold to classify cash and stock acquisitions.

<sup>3</sup> The SDC database reports transaction values for approximately 91% of all the acquisitions in Panel A and 98% in Panel B. In our sample, only 4.2% of the announced acquisitions are not completed.



acquisitions as serial cash acquirers (approximately 7,500), which represents a significant proportion of all acquisitions (35.9%). This is not entirely surprising. Serial switchers conduct a larger average number of transactions per block (11.7 vs. 6.3 acquisitions) over a longer serial block length (5.7 vs. 3.2 years). The longer block length and higher number of acquisitions for serial switchers suggest a greater need for the acquirer to tailor the method of payment to changes in the acquirer's or target's characteristics. Overall, this evidence highlights the economic importance of serial switchers relative to serial cash and serial stock acquirers.

Serial switchers seem to use stock as the method of payment when acquiring larger targets. The average transaction value for stock acquisitions conducted by serial switchers is \$636 million, more than three times the average transaction value for cash acquisitions (\$196 million). These are also considerably larger than the average transaction values for cash-only and stock-only acquirers (\$165 million and \$159 million respectively).

Analysis of public targets, reported in Panel B, yields broadly similar results. With only 1,893 transactions (9% of the total 21,123 transactions reported in Panel A), the total transaction value of public targets represents 47% (\$2,248 billion) of the transaction value in the entire sample. Serial acquirers are even more important in this subsample, making up 65.9% of the 1,356 acquirers of public targets, and conducting 75.2% of all acquisitions. In addition, the average and total transaction value of acquisitions by serial switchers that pay with stock (\$1,433 billion and \$1,947 million, respectively) are even higher compared to the other categories. Average transaction values of the remaining types of acquisitions are similar to the values in Panel A.

As a first step in our effort to examine whether firm characteristics affect the method of payment decision, Table 2 reports firm characteristics for acquirers (Panel A) and targets (Panel B) in our sample. All variables pertain to the quarter prior to the acquisition announcement, and are industry-adjusted based on the annual industry median, except for long-run growth opportunities. Industries are classified according to the 48 Fama-French industry classifications. We report three operating performance ratios: return on assets (ROA, defined as earnings before income taxes plus depreciation (EBITD) divided by total assets), net income margin (defined as net income divided by net sales), and quarterly sales growth (computed as the change in net sales from two to one quarters prior to the acquisition announcement). Leverage is defined as long

term debt to total assets. The liquidity ratio is computed as cash and cash equivalents divided by total assets. Market capitalization is our proxy for size.

In Panel A, when we sort on the method of payment, we find that cash and stock acquirers exhibit significantly different characteristics, whether we compare the cash and stock acquisitions of serial switchers (rows 4-5) or the serial cash-only and stock-only acquirers (rows 6-7). Serial acquirers are considerably larger (with an average market capitalization of \$3.26 billion) than non-serial acquirers (with an average market capitalization of \$1.24 billion – not reported in table). This is mainly driven by serial switchers who are significantly larger than cash-only or stock-only acquirers. Within each group though, serial acquirers who choose to pay in cash are significantly larger than serial acquirers who choose to pay in stock. Serial cash acquirers have better operating performance (net income margin), lower sales growth, higher leverage, and lower liquidity (in terms of cash and cash equivalents) compared to serial stock acquirers. This last result is not entirely surprising. If the acquirer's stock is not overvalued, the acquirer should prefer to finance the acquisition with cash, even when facing low liquidity. The characteristics of serial switchers place them between these two extremes, with two exceptions: serial switchers are larger than serial cash-only or stock-only acquirers, and they have higher net income margin than serial stock-only acquirers. However, the difference in characteristics remains unchanged when we compare the cash and stock acquisitions made by serial switchers. Larger and more profitable firms may have more options in deciding whether to pay in cash or stock – thus being able to switch method of payment, compared to other serial acquirers.

When we turn to the targets that these firms acquire (Panel B), the results indicate a weaker relation between the method of payment and target characteristics. Serial cash acquirers appear to acquire targets with better operating performance (higher ROA and net income margin), smaller sales growth, and less cash on hand. Serial switchers acquire targets with characteristics in between those acquired by serial cash-only and serial stock-only acquirers though the pattern shifts – cash targets of serial switchers have worse operating performance and lower net income than stock targets. Overall, we conclude that acquirer characteristics appear strongly related to the method of payment decision while target characteristics appear to be at best weakly related.

### 3. Analysis of the unconditional method of payment decision for serial acquirers

The first part of our analysis examines the unconditional choice of cash or stock as method of payment for all serial acquirers. We first examine how acquirer and target firm characteristics impact the acquirer's decision to pay cash or stock in an acquisition. We employ both a univariate framework (Sections 3.1 and 3.2), and a multivariate framework (Section 3.3). Subsequently, we examine whether the *relative* overvaluation of acquirer and target affects the method of payment (Section 3.4).

#### 3.1. Acquirer overvaluation and the method of payment: univariate analysis

In this section, we report our first test of the acquirer misvaluation hypothesis behind the acquirer's decision to pay cash or stock. Table 3 reports univariate statistics on proxies for acquirer overvaluation, and relates these proxies to the method of payment decision. We use seven overvaluation proxies: stock returns over the quarter and year before the acquisition announcement, the standard deviation of the monthly stock returns during the year prior to the announcement, Tobin's Q, the standard deviation of Tobin's Q over all firms in the acquirer's industry, and most importantly, the firm-specific error, and the industry sector-specific error following RRV (2005).<sup>4</sup> We use two proxies for growth opportunities: research and development (R&D) expenses divided by total assets, and the long-run growth opportunities proxy following RRV (2005).

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<sup>4</sup> RRV (2005) decompose the market to book ratio into three components: the firm-specific pricing deviation from short-run industry pricing; sector-wide, short-run deviations from long-run pricing; and long-run pricing to book. The first component, firm specific error, assesses the firm-specific deviation from valuations implied by sector valuation multiples. It measures deviations from industry-average growth and discount rates and provides a more precise measure of firm-specific misvaluation than the coarser Tobin's Q. The second component, industry sector-specific error, assesses short-run pricing deviations from long-run average values at the industry level. It tells us whether an entire industry sector is misvalued. Hence both the firm-specific and the industry sector-specific errors measure misvaluation of different types (we examine differences in more detail in the next section). The acquirer can take advantage of either source of misvaluation when choosing to pay with stock. The last component measures long-run growth opportunities, based on the true value to book ratio. This long run value to book assesses the difference between long run multiples and current book values, unadulterated by misvaluation effects. Following the third model proposed by RRV (2005, pg. 577), we estimate the three components by running annual cross-sectional regressions at the industry-level of the log of the market value of common equity on the log of the book value of common equity, log of net income (with an adjustment to control for the sign of net income), and long term leverage.

Compared to cash acquirers, stock acquirers earn significantly higher stock returns prior to the deal (both in the most recent quarter and over the prior year), have larger standard deviation of stock returns, are more misvalued as proxied by the firm-specific error and Tobin's Q, operate in industries with higher sector-specific error, and smaller long-run growth opportunities. These results hold whether we compare serial cash to serial stock switchers or when we compare the serial cash to serial stock acquirers. In unreported analyses, we restrict the analysis to acquisitions of public targets where information is available and draw broadly similar conclusions. They are consistent with the conjecture that acquirers should prefer to finance the acquisition with stock when the acquirer's stock is overvalued, even if the source of overvaluation lies on an overheated industry sector. This evidence provides strong support for the acquirer misvaluation hypothesis.

### **3.2. Target overvaluation, uncertainty and competition: univariate analysis**

In this section, we report our first test of the winner's curse hypothesis behind the method of payment decision. According to this hypothesis, acquirers offer payment in stock in order to acquire targets who are overvalued, whose value is uncertain, or when faced with potential competition. We examine consecutively whether proxies for target overvaluation, the level of competition, and uncertainty in target valuation are related to the method of payment.

#### *Target Overvaluation*

Table 4 Panel A reports univariate statistics on proxies for target overvaluation, and relates these proxies to the acquirer's method of payment decision. We report the same overvaluation and growth opportunities proxies as in the previous section.

Cash acquirers (either switchers or serial cash acquirers) acquire targets that operate in industries with smaller industry sector-specific error but a larger standard deviation of industry Tobin's Q. These findings may suggest that serial cash acquirers search for targets in industries with larger undervaluation and where the range of firm values, proxied by Tobin's Q is larger. However, in contrast to the results for acquirers, the differences in target overvaluation are not consistently significant when we examine cash and stock deals. Targets do not appear to have earned significantly higher prior stock returns when the acquirer chooses to pay in stock. While Tobin's Q and firm-specific error suggest a higher degree of misvaluation in stock relative to cash deals, for Tobin's Q, the difference is only significant for the stock and cash deals

announced by serial cash-only acquirers and serial stock-only acquirers. Furthermore, some results lose significance or reverse in direction when we compare stock to cash acquisitions made by serial switchers and cash-only and stock-only acquirers. As an example, in contrast to serial cash-only and stock-only acquirers, serial switchers pay stock to acquire targets with larger long-run growth opportunities. In unreported analyses, we restrict the analysis to public targets where information is available and draw broadly similar conclusions. Overall, target overvaluation does not appear to play as significant a role as the acquirer's overvaluation in the method of payment decision.

#### *Implied Competition level*

We next examine whether the level of competition in acquisitions affects the chosen method of payment. According to the winner's curse hypothesis, acquirers may choose to pay in stock when faced with high potential competition, in order to mitigate the higher risk of overpayment. Following Aktas, de Bodt and Roll (2010), we proxy for competition using four measures: (i) buyout activity (total annual investment by US private buyout funds, from SDC Venture Economics Information Services database, divided by the total market capitalization of US public firms listed in NYSE, Nasdaq and AMEX from CRSP); (ii) a liquidity index, which we construct following Schlingemann, Stulz, and Walkling (2002) as the ratio of the annual value of all corporate control transactions, obtained from the SDC database, divided by the total assets of firms in the same two-digit SIC code for that year; (iii) an indicator variable for acquisitions announced during a recession (coded as one for acquisition announcements during quarters classified as economic recessions by the National Bureau of Economic research (NBER)); and (iv) the target's leverage ratio to proxy for auction costs (less levered targets may be subject to smaller auctions costs, and thus invite more competition). We expect a higher level of potential competition for acquisitions announced in periods with high buyout activity, high market liquidity, no recession, and with smaller expected auctions costs (lower leverage).

The results in Table 4 Panel B offer mixed support for the winner's curse hypothesis. Pointing away from the winner's curse, cash acquisitions (whether we examine all, cash-only acquirers or switchers) are systematically announced when competition levels are *higher* – both in terms of buyout activity and market liquidity. Factors pointing in the direction of the winner's curse include the likelihood of being in a recession quarter and leverage (for serial cash-only and stock-only acquirers). However, given that the recession dummy variable is likely to be inversely

related to target stock returns (a proxy for misvaluation in Panel A), it may not constitute a clean proxy for competition. It is also possible that the proxies proposed by Aktas, de Bodt, and Roll (2010) apply to single-bidder negotiations only or that the type of competition that each proxy captures provides different incentives to use cash or stock. For example, when buyout activity is higher, targets may prefer to receive cash given that the buyout proxy is correlated with the existence of private bidders that are likely to offer cash. Hence, to control for additional variables and potential interactions, we defer further conclusions to the multivariate analysis in the next section.

#### *Uncertainty of the target's valuation*

In Table 4 Panel C, we proxy for the level of uncertainty in the target's valuation, using its intangible assets and R&D expenses, following Boone and Mulherin (2008). The results again do not support the winner's curse hypothesis – targets in cash acquisitions have *higher* intangible assets, in both the raw and industry-adjusted ratio, suggesting *higher* uncertainty in value. There is no difference for the acquisitions conducted by serial switchers. Moreover, the level of R&D expenses does not differ between targets in cash and stock acquisitions.

Overall, the evidence in Tables 3 and 4 lends stronger support towards the acquirer misvaluation hypothesis than the winner's curse hypothesis. The evidence for the winner's curse hypothesis is either not robust (when we examine target overvaluation) or inconsistent (when we examine the level of competition and the uncertainty in target value).

### **3.3. Multivariate analysis of the method of payment decision**

In this section, we examine the relative importance of the determinants of the acquirer's decision to pay cash in a multivariate setting. Table 5 reports the results from logistic regressions on the probability of choosing cash over stock as the method of payment. The dependent variable is a binary variable that equals one when the method of payment is cash. Firm characteristic variables are the same used in the previous tables. We use Eicker-Huber-White-Sandwich heteroskedastic-robust standard errors clustered by industry (our results are robust to clustering by both industry and year). Models 1-4 are estimated in the entire sample of M&A transactions

(including non-serial acquirers), whereas in models 5-6 we divide the sample into deals by serial and non-serial acquirers.<sup>5</sup>

Model 1 includes only acquirer characteristics as explanatory variables. In line with the univariate analysis, several acquirer characteristics significantly affect the decision to pay cash relative to stock in an acquisition. The factors that increase the probability of paying with cash are: higher operating performance, lower sales growth, higher leverage, and higher cash levels. In addition, an acquirer is more likely to offer cash if it earns lower prior quarterly stock returns, has lower standard deviation of returns, lower firm-specific error, higher standard deviation of the industry Tobin's Q, and lower R&D expenses.

Model 2 analyzes whether the decision to offer cash is related to the characteristics of the target. Consistent with financing concerns, acquirers prefer to pay stock when targets are larger and more levered. Consistent with Hansen (1987) and Martin (1996), acquirers seem to choose to reduce information asymmetry concerns by preferring stock payments when the standard deviation of the target's stock return in the prior year is larger. Furthermore, consistent with Table 4, acquirers are more likely to pay *cash* when the level of intangible assets is high. Overall, these results are also in line with our earlier univariate results.

In Model 3, we examine whether macroeconomic variables affect the method of payment decision. The US stock market return in the prior quarter controls for overall stock market overvaluation (Shleifer and Vishny, 2003; Baker, Stein, and Wurgler, 2003; Rhodes-Kropf et al, 2005). The average volatility index (VIX) and its standard deviation in the 6 months before the acquisition announcement proxies for the level and uncertainty of exogenous risk (Zhang, Zhou, and Zhu, 2009). Buyout activity proxies for the level of competition in the acquisitions market (Aktas et al, 2010). When examined in isolation, Model 3 shows that all the variables significantly impact the decision to pay cash. The probability of paying cash is higher when prior stock market returns are low, when the level of volatility index is low and its standard deviation high, and when buyout activity is high.

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<sup>5</sup> To alleviate concerns of multicollinearity between the industry-specific error and the standard deviation in the industry's Tobin's Q, we also estimate all models excluding one of the two, and find similar signs and significance levels for both variables as those reported in Table 5.

In the remaining specifications, we include acquirer and target characteristics as well as the macroeconomic controls in the same regression. We estimate the regressions over the entire sample of M&A transactions (Model 4), and in the serial and non-serial acquisition sub-samples (Models 5 and 6 respectively). The results for the entire sample are driven by the sub-sample of serial acquisitions. Few variables are significant in the sub-sample of non-serial acquisitions. The variables that support the acquirer misvaluation hypothesis retain their significance in Models 4 and 5. Consistent with our univariate results, an acquirer is less likely to offer cash when it has earned high recent stock returns and when it is overvalued (has a high firm-specific error). The motivation to use cash vs. stock seems to relate to a misvaluation story for serial acquirers. In contrast, target misvaluation is significant in affecting the method of payment decision only in so far as serial acquirers use stock to purchase targets that operate in overvalued *industries* (industries with high industry-sector specific error). The remaining proxies for the winner's curse hypothesis are not significant, with the exception of uncertainty in target valuation that appears positively related to stock payments in the very small sub-sample of non-serial acquirers in Model 6 (non-serial acquirers prefer to pay stock for targets with high intangible assets and R&D expenses).

Overall, the evidence so far is consistent with the hypothesis that the acquirer's characteristics, mainly related to overvaluation, drive the choice to pay cash vs. stock. Target characteristics, related to the winner's curse hypothesis, may be of only secondary importance.

### **3.4. Relative acquirer and target overvaluation, and the method of payment**

In Table 6 we report the results from an alternative test in order to explore further whether acquirers choose the method of payment based on their own overvaluation rather than on the target's overvaluation and uncertainty. More specifically, we examine the *relative* importance of acquirer and target overvaluation and uncertainty in determining the method of payment. We classify an acquirer (target) as highly overvalued if its overvaluation proxy exceeds the 75% percentile of the acquirer (target) sample distribution. We further split the sample based on whether the acquirer is more overvalued than the target. The table reports the proportion of cash acquisitions in each sub-sample.

Panel A partitions the sample based on acquirer overvaluation. According to all four overvaluation proxies, acquirers with high overvaluation prefer to use stock as the method of



payment (and consequently are less likely to use cash) regardless of whether the target's overvaluation is larger than the acquirer's overvaluation. For example, using the firm-specific error as the overvaluation proxy, only 21.8% of the acquisitions are conducted by acquirers with high overvaluation use cash as the method of payment, whereas 34.5% of acquisitions conducted by acquirers with low overvaluation are cash acquisitions. We also find that the relative degree of overvaluation between acquirer and target is typically not significant in explaining the proportion of cash acquisitions. These findings suggest that the acquirer's high overvaluation matters more to the method of payment decision than the relative overvaluation between the acquirer and the target.

Panel B partitions the sample based on target overvaluation. When the target is highly overvalued, acquirers are less likely to use cash according to only two of the four overvaluation proxies (Tobin's Q and firm-specific error). The subsamples based on the relative degree of overvaluation between target and acquirer show that the proportion of cash acquisitions is consistently smaller only when the acquirer is more overvalued than the target. For example, using the stock return in the prior quarter as the overvaluation proxy, only 16% of the acquisitions that involve acquirers where the acquirer is more overvalued than the (highly overvalued) target are cash acquisitions, whereas 31.1% of the acquisitions are paid in cash when the target is not highly overvalued. Furthermore, based on three out of the four overvaluation proxies, we find that the proportion of cash acquisitions is consistently smaller in the subsample of acquirers that are more overvalued than the targets, even when the target is overvalued. These findings suggest that what matters most to the method of payment decision is that the acquirer's degree of overvaluation is higher than the target's.

Panel C partitions the sample based on the uncertainty in the value of the target. There are a higher proportion of cash acquisitions when the target's value is uncertain, in contrast to the predictions of the winner's curse hypothesis. Again, the subsample in which the acquirer's overvaluation is higher than the target's overvaluation (where we find the lowest frequency of cash acquisitions) seems to be driving these results.

Overall, these tests also provide stronger support for the acquirer misvaluation hypothesis than the winner's curse hypothesis. Acquirers with high overvaluation prefer to pay with stock especially if the acquirer has higher overvaluation than the target.

A further related test is to examine how the market views these decisions. The winner's curse hypothesis predicts that acquirers should use stock in order to purchase overvalued targets or targets with uncertain value regardless of the acquirer's overvaluation. We next compute the abnormal stock returns to acquirers, in order to determine whether the market rewards acquirers who are not overvalued, when they purchase overvalued targets or targets with uncertain value by paying stock.

In Table 7, we report short-term announcement period cumulative abnormal returns estimated over a 7-day window centered at the announcement date, and long-term cumulative abnormal returns, estimated over a one-year window starting on the announcement date. No matter how we divide the different sub-samples in Panels A-B, for all combinations of acquirer and target overvaluation or uncertainty, acquirers who use stock as the method of payment earn either insignificantly different or *lower* (and mostly negative) excess returns compared to acquirers who use cash. For example, in Panel A, when the acquirer is not highly overvalued and the target is more overvalued than the acquirer (regardless of whether the target is highly overvalued), paying with cash consistently benefits the acquirer. When the target is highly overvalued and more overvalued than the -not highly overvalued- acquirer, paying with cash also benefits the acquirer. In contrast to the predictions of the winner's curse hypothesis, paying with cash for highly overvalued targets either benefits the acquirer or does not leave it worse off. In unreported results, we find acquirers earn higher short-term and long-term abnormal returns when they pay cash regardless of the level of uncertainty on the target's value. Far from being rewarded, acquirers earn *lower* excess returns when they use stock irrespective of the target's overvaluation or uncertainty. This is consistent with the market believing that acquirers consider only their own degree of overvaluation when buying targets.

#### **4. The decision to switch the method of payment**

The second part of our analysis examines the decision of serial acquirers to *switch* from one form of payment to another conditional on their previous choices. First, we examine how often serial acquirers switch methods of payment (Section 4.1). Our main aim is to examine whether characteristics that are significant in determining the unconditional choice between cash and stock as the method of payment in general are also significant in explaining when serial acquirers *switch* between methods of payment (Section 4.2). Next we examine whether the

determinants of switching the method of payment differ between close and distant acquisitions (Section 4.3). Finally, we assess whether the method of payment has an impact on the gap between subsequent acquisitions using a duration analysis (Section 4.4).

#### **4.1. How often do serial acquirers switch the method of payment?**

In Table 8, we examine whether serial switchers display any significant patterns in their method of payment choices. We examine both *close* acquisitions (announced within a year of each other) and *distant* acquisitions (announced between one and three years apart). Panel A reports the frequency distribution for all serial acquisitions conditional on the method of payment in the prior acquisition in the same serial block. Panels B and C report the distributions for close and distant acquisitions respectively.

Panel A shows that serial acquirers tend to stay with the same method of payment if they paid cash in the previous acquisition. Only 14% of the acquirers that paid cash in their previous acquisition decide to switch into stock in the current acquisition. We note that including cash-only and stock-only acquirers in this analysis is important. We classify the method of payment ex post, but ex ante, all serial acquirers face the same choice of switching and choose not to switch. When we examine serial switchers alone, we find that a significant proportion (35%) of serial switchers switch from paying stock in the previous acquisition to paying cash in the current acquisition. The propensity to switch is even higher when we examine serial switchers who used stock in their previous acquisition: almost half change to cash in the subsequent acquisition.

In Panels B and C, there are twice as many close acquisitions (8,786) compared to distant acquisitions (3,708), suggesting that close acquisitions are economically extremely significant. Not surprisingly, the likelihood of switching methods of payment is higher for distant compared to close acquisitions. However, the likelihood of serial switchers switching methods of payment in close acquisitions is non-trivial. For close acquisitions, 40% of serial switchers switch from stock in one acquisition to cash in the next, while 32% go the other way from cash to stock. For distant acquisitions, the numbers rise to 64% and 41% respectively. The higher propensity to switch from stock into cash (as opposed to from cash into stock) suggests that the window of opportunity for stock deals may be shorter compared to cash deals, in line with the acquirer misvaluation hypothesis. The higher propensity to switch in distant acquisitions may also be due

to changing firm characteristics and macroeconomic conditions. We defer further investigation in the following sections.

#### **4.2. The decision to switch the method of payment: multivariate analysis**

In this section, we study the determinants of the decision to switch the method of payment for serial acquirers in a multivariate framework. As explained in the previous section, the impact of acquirer and target characteristics may differ depending on the time elapsed between the prior and the current acquisition. Hence, we first analyze all switching decisions, switching from stock into cash and from cash into stock, irrespective of when the switching occurs. In the next two sections, we examine in more detail the potential differential impact of firm characteristics in close and distant acquisitions.

Table 9 reports the results of logit models on the probability of switching the method of payment for serial acquirers (the model specifications are similar to those in Table 5). Panel A examines the decision to switch from stock into cash. The dependent variable in the models is a binary variable that equals one when the acquirer paid with stock in the prior acquisition and switches to cash in the current acquisition, and zero otherwise. The sample includes all acquisitions within a serial block conducted by serial switchers and stock-only serial acquirers. As noted before, including the stock-only acquirers is important since *ex ante*, these acquirers have the choice of switching and choose not to switch. The propensity to switch into cash in the current acquisition is significantly negatively related to the prior stock returns earned by the acquirer, sales growth, and R&D expenses. Higher cash holdings increase the probability of shifting from stock into cash. In contrast, higher stock returns and firm-specific error reduce the probability of switching from stock into cash. The evidence is consistent with acquirers switching into cash when they are not overvalued and when they hold more cash.

When we examine target characteristics, acquirers prefer cash when target firms have higher levels of intangible assets but lower R&D expenses, higher ROA, higher stock returns, higher standard deviation of the industry Tobin's Q, and lower industry sector-specific error. The firm-specific error coefficient is insignificant. This evidence is not consistent with the winner's curse hypothesis.

In Models 5 and 6, the probability of switching into paying cash increases after more than one year has elapsed from the previous acquisition. The significant positive coefficient for the

number of prior acquisitions in the same serial block also suggests that serial acquirers pay cash for the later acquisitions within the block. This result may suggest that the window of opportunity for doing stock deals is shorter, consistent with acquirer misvaluation. We examine this result in greater detail in the following sections.

Panel B examines the decision to switch in the other direction, from cash into stock. The dependent variable equals one when the acquirer paid with cash in the prior acquisition and switched to stock in the current acquisition, and zero otherwise. The sample includes all acquisitions within a serial block conducted by serial switchers and cash-only serial acquirers. Consistent with the acquirer misvaluation hypothesis, switching into stock is preferred when the acquirer's firm-specific error levels are high (the same result, albeit weaker in some models, also exists for higher levels and standard deviation of stock returns). Moreover, the propensity to switch into stock increases with higher recent sales growth. Interestingly, neither leverage nor cash holdings seem to affect the decision to switch from cash into stock

When we examine target characteristics, acquirers seem to prefer to switch into stock for larger and more levered targets. The only evidence consistent with the winner's curse hypothesis is that acquirers switch into paying using stock when the target's *industry* is overvalued. In stark contrast to the prediction of the winner's curse hypothesis, acquirers are more likely to switch into paying with stock when there is less potential competition for targets and when buyout activity is low. Finally, in contrast to Panel A, the time between serial acquisitions is insignificant in explaining the switching decision from cash into stock.

Overall, these results suggest that acquirer characteristics (mainly overvaluation) and prior payment behavior seem to be consistent first-order determinants of the method of payment. Interestingly, the time between serial acquisitions affects only the switching decision from stock into cash but not the other way around. We explore this difference in the impact of the gap between serial acquisitions in the next section.

#### **4.3. The decision to switch the method of payment for close and distant acquisitions**

In Table 10, we report univariate results of changes in acquirer and target firm overvaluation characteristics in close and distant acquisitions. *Close* acquisitions are announced within a year of each other, and *distant* acquisitions are announced between one and three years apart. We report changes for three different subsamples: (i) acquisitions in which serial switchers

switch the method of payment in the current acquisition, (ii) acquisitions in which the serial switchers do *not* switch the method of payment in the current acquisition, and (iii) acquisitions by serial cash-only and stock-only acquirers who, ex post for our classification purposes, never switch the method of payment, but who face the potential decision to switch between subsequent acquisitions. Changes in acquirer characteristics are estimated using quarterly data. Changes in target characteristics are estimated by comparing the target in the prior acquisition to the target in the current acquisition as reported at the closest quarter before the announcement date, conditional on having information on both targets.

Panel A reports levels and changes in overvaluation proxies, for close acquisitions. Acquirers who switch from paying cash to paying stock are significantly more overvalued than acquirers who switch from stock into cash. The results for acquirers who do not switch the method of payment are similar. When we examine changes in the overvaluation proxies, there are no differences between acquirers who switch from stock into cash and those who switch from cash in to stock. This is not surprising, given the short time from one announcement to another in close acquisitions. Similarly, there are no statistically significant differences when we examine changes in target characteristics. Panel B reports the same proxies for acquirers and targets in distant acquisitions. Serial switchers switch from stock into cash when they experience a decline in overvaluation levels. In line with close acquisitions, there are few significant differences when we examine changes in overvaluation.

Given the general lack of significance in the univariate setting, we next examine these questions in a multivariate framework. Table 11 reports coefficients from logistic regressions on the probability of switching the method of payment for close and distant serial acquisitions separately. We restrict our analysis to overvaluation proxies and control variables. Models 1 and 2 examine the decision to switch from stock into cash by setting the dependent variable equal to one if the acquirer paid with stock in the prior acquisition and switches to cash in the current acquisition, and zero otherwise. Models 3 and 4 examine the decision to switch from cash into stock by setting the dependent variable equal to one if the acquirer paid with cash in the prior acquisition and switches to stock in the current acquisition, and zero otherwise. We estimate each specification separately in the sub-samples of close and distant acquisitions.

Panel A examines acquirer characteristics. Models 1 and 2 show that recent increases in cash holdings increase the probability of switching from stock into cash, regardless of the time

between the acquisitions. The impact is stronger for the decision to switch from stock into cash in close acquisitions, and for the decision to switch from cash into stock in the distant acquisitions. The additional time required to raise equity capital relative to using cash on hand might explain this difference. Overvaluation proxies are significantly related to the decision to pay for an acquisition with stock. Specifically, firms with low levels of firm specific error are likely to switch into paying cash, while firms with high levels of firm specific error are likely to switch into paying with stock. Interestingly, an increase in the firm specific error is negatively related to the likelihood of paying with stock for close acquisitions in Model 3 but is significantly positively related for distant acquisitions in Model 4. Table 10 documented that serial switchers who switch from cash into stock in subsequent acquisitions are still likely to be overvalued. This may explain the negative sign for close acquisitions.

Panel B examines target characteristics. We use only level variables because the estimation of changes in target characteristics requires that both targets in consecutive acquisitions are public, which reduces the sample dramatically. The main insight is that the impact of the standard deviation of the stock return in the prior year (related to misvaluation) and the standard deviation of Tobin's Q (related to differences in value within the industry) are significant only for close acquisitions. This would be consistent with short-lived opportunities to acquire either cheaper assets (according to a misvaluation hypothesis) or valuable assets during a shock in the industry (according to a neoclassical hypothesis). Acquirers are also more likely to use cash in distant acquisitions when the target has higher R&D expenses. After controlling for other target characteristics, intangible assets are significant in explaining the decision to pay in cash only in Model 1 and insignificant in Models 2, 3, and 4.

Overall, Table 11 provides further evidence in favor of the acquirer misvaluation hypothesis. As before, we find limited support for the winner's curse hypothesis.

#### **4.4. Do overvalued acquirers make subsequent acquisitions faster when using stock?**

Our earlier evidence suggested that the window of opportunity for doing stock deals may be shorter compared to cash deals. If the acquirer tries to take advantage of temporary overvaluation, the acquirer misvaluation hypothesis suggests two effects on the acquisition dynamics. First, the acquirer's overvaluation should accelerate the event of a stock acquisition

(over a cash acquisition). Second, when the acquirer's overvaluation is higher, the hazard of paying with stock should be higher.

In this section, we use duration analysis in order to examine whether acquirers make subsequent acquisitions faster when using stock. Duration analysis is the analysis of the time to the occurrence of an event, in our framework a subsequent acquisition, and centers on the survival time until failure (see Wooldridge (2010) and Cleves et al. (2004)). We define "failure" (i.e., the occurrence of the examined hazard) as one if the acquirer uses stock over cash in a subsequent acquisition, and zero otherwise. We classify an acquisition as a subsequent acquisition if the acquirer has ever made a prior acquisition since 1980. Specifically, we estimate the effect of the acquirer's overvaluation on the expected duration of each serial acquisition spell (i.e., the time between two subsequent acquisitions). Each serial acquisition spell starts with the date of the prior acquisition and ends on the date of the current acquisition.<sup>6</sup>

To model the effect of the acquirer's overvaluation covariates on the acquisition dynamics in event time, we use two main specifications: (i) a parametric log-logistic model based on an Accelerated Failure Time (AFT) framework, and (ii) a semi-parametric Cox model based on a Proportional Hazard (PH) framework (see Wooldridge (2010) and Cleves et al. (2004)). The Accelerated Failure Time (AFT) model stresses the importance on the role of time and how the time-to-fail can be accelerated as a function of the covariates. The survival function in an AFT model refers to the probability that the time of the subsequent acquisition occurs later than some specified time. The survival function is non-increasing which means that survival at a later point in time can happen only if the firm is surviving until that time. We use the AFT models to determine whether acquirer's overvaluation increases or decreases the predicted failure times, in our setting, the occurrence of the subsequent stock-acquisition, hence affecting the survival function. The PH model focuses on the analysis of the actual risk process that causes failure and models risk changes, in a proportional way, with the values of the covariates. We use the PH models to determine whether the acquirer's overvaluation increases or reduces the risk (i.e., the hazard rate) of a subsequent stock acquisition at any point in time. The hazard rate measures the rate at which risk accumulates. The hazard function approximates the probability

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<sup>6</sup> For simultaneous acquisitions, the spell time is based on the acquisition that occurred before the current set of simultaneous acquisitions. Our results are robust to excluding the events in which there is more than one acquisition in the same day.



that the failure event occurs in a given interval, divided by the width of the interval. The hazard function describes the instantaneous *rate* of failure and it can increase, decrease, or remain constant.

Figure 1 depicts the non-parametric Kaplan-Meier estimators of the density hazard function of a stock-acquisition after splitting the sample between low and high acquirer overvaluation based on below- and above-median firm specific error, where the medians are estimated annually. The risk (i.e., the hazard rate) of a stock acquisition accumulates much faster when the overvaluation of the acquirer is high. We obtain similar graphs when using the other three overvaluation proxies. This result reinforces the findings from the previous section that the role of the acquirer's overvaluation is stronger in close serial acquisitions. In other words, the window of opportunity for doing stock deals is shorter.

In Table 12, Models 1-2 report coefficients from log-logistic AFT models on the occurrence of an acquisition, where a stock acquisition constitutes a "failure". We find that stock returns in the quarter before the announcement and the acquirer's firm-specific error significantly accelerate the predicted time for a stock acquisition to occur. Models 3-4 report coefficients from Cox PH models on the hazard of a stock acquisition. Stock returns in the quarter before the announcement and the firm-specific error also significantly increase the predicted risk of the occurrence of a stock acquisition.<sup>7</sup>

Overall, the evidence from Figure 1 and Table 12 provides further support for the acquirer misvaluation hypothesis. The effect of higher acquirer overvaluation is twofold: subsequent stock acquisitions occur faster than subsequent cash acquisitions, and the hazard rate of a stock acquisition significantly increases.

## 5. Robustness tests

We perform two types of robustness tests. First, in order to assess the robustness of our results to the thresholds that define what constitutes a stock or a cash acquisition, we replicate our analysis by classifying an acquisition as a cash (stock) acquisition if the percentage of

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<sup>7</sup> Untabulated models that also include target firm characteristics provide similar results. Due to data availability, however, the sample is smaller. The significance and magnitude of the target's overvaluation proxies is smaller than that of the acquirer's. The uncertainty proxies (i.e., target's intangible assets) are never significant.

payment in cash (stock) is greater than 60% or equal to 100%. Second, we also vary the number of years required to classify an acquisition as part of a serial block to 2 or 5 years around the current acquisition.

When we replicate the logit Model 4 of the decision to pay cash (from Table 5), in all 8 models (results not tabulated for brevity), higher values of the acquirer's overvaluation proxies decrease the probability of paying cash. In contrast, none of the target's overvaluation or uncertainty proxies are significant. Replicating logit Model 1 of the decision to switch method of payment from stock to cash (from Table 9, Panel A) shows that in line with our previous evidence, the acquirer's overvaluation proxies decrease the probability of switching from stock into cash. Finally, when we model the decision to switch method of payment from cash into stock (from Table 9, Panel B), we again find evidence that the acquirer's overvaluation proxies increase the probability of switch from cash to stock. We find similar results for the acquirer's overvaluation proxies. The coefficients for the target's overvaluation and uncertainty proxies are insignificant. Overall, our results do not seem to be driven by our definitions of the method of payment or the length of serial blocks.

## **6. Conclusions**

Prior literature has attributed the choice of method of payment by acquirers in acquisitions to either the acquirer misvaluation hypothesis or the winner's curse hypothesis. In the former, acquirers attempt to take advantage of their overvalued shares by using them to buy target firms. In the latter, acquirers faced with high competition for targets and uncertainty about target values will offer stock to reduce the likelihood of overpayment. In this paper, we analyze the relative importance of the two hypotheses by examining how the method of payment relates to the characteristics of acquirers and target firms in acquisitions conducted by serial acquirers. Serial acquirers constitute a significant proportion of acquirers in general (half of all acquirers over the 1980-2010 period), and these serial acquirers conduct the vast majority of acquisitions (in frequency and transaction value).

We show that acquirers appear to strategically switch between methods of payment based on changes in their own characteristics. In particular, they attempt to take advantage of their overvalued shares in making stock-financed acquisitions. Target overvaluation does not appear to play a significant role in the acquirer's choice of payment method, suggesting that avoiding

the winner's curse is at best a secondary consideration for buyers. Acquirers seem to benefit from using their overvalued stock, regardless of the target's overvaluation and uncertainty.

Why do targets not perceive the acquirer's motivation in offering overvalued shares? Perhaps as Hartzell, Ofek, and Yermack (2004) argue, target firm managers are compensated through side payments. Alternatively, as Rhodes-Kropf and Vishwanathan (2004) argue, they are unable to accurately identify the degree of acquirer over-valuation. It is interesting to examine if targets are more able to perceive acquirer overvaluation in serial acquisitions since there are several opportunities to observe the behavior of the acquirer in previous deals. That is however, beyond the scope of the current paper.

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**Table 1. Frequency and magnitude of series of acquisitions**

This table reports descriptive statistics on all acquisitions, serial acquisitions, serial acquisitions with no pattern in the method of payment (serial switchers), and serial acquirers consistently paying in cash or in stock respectively. The sample consists of announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. Panel A describes the entire sample and Panel B, the subsample for which target firm characteristics are available in Compustat. An acquisition is classified as a cash (stock) acquisition if the percentage of payment in cash (stock) is greater than 80%. We classify an acquisition as part of a block of a series of acquisitions (i.e., as a serial acquisition) if the acquirer has made a prior acquisition within 3 years of the current acquisition. An acquirer is a serial cash (stock) acquirer if the percentage of payment in cash (stock) is greater than 80% in all the acquisitions of the block of a series of acquisitions. An acquirer is a serial switcher if it announces both cash and stock acquisitions in the block of a series of acquisitions. The SDC database reports transaction values for approximately 91% of all the acquisitions in Panel A and 98% in Panel B. P-values for differences on means between the different types of acquirers are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance.

**Panel A. Entire sample**

Category	Number of acquirers [N]	Proportion of all acquirers (by #)	Total number of acquisitions [N]	Proportion of all acquisitions (by #)	Total value of acquisitions [\$ Billions]	Proportion of all acquisitions (by value)	Average value of acquisitions [\$ MM]	Average serial block length [ Years]	Maximum serial block length [ Years]	Avg. # of deals in a serial block [N]	Maximum # of deals in a serial block [N]
1 All acquisitions	6,394	100.0%	21,123	100.0%	4,766.8	100.0%	245.2				
2 All serial acquisitions	3,309	51.8%	16,440	77.8%	4,021.7	84.4%	266.8	4.3	25	8.6	111
3 Serial switchers	1,289	20.2%	7,585	35.9%	2,685.0	56.3%	388.8	5.7	25	11.7	111
4 Serial switchers - cash	1,289	20.2%	4,241	20.1%	761.4	16.0%	196.1				
5 Serial switchers - stock	1,289	20.2%	3,344	15.8%	1,923.6	40.4%	636.1				
6 Serial cash acquirers	1,823	28.5%	7,413	35.1%	1,125.9	23.6%	164.6	3.2	16	6.3	38
7 Serial stock acquirers	459	7.18%	1,442	6.83%	210.7	4.4%	159.4	2.1	11	4.4	20

**Panel B. Subsample with available information for target**

Category	Number of acquirers [N]	Proportion of all acquirers (by number)	Total number of acquisitions [N]	Proportion of all acquisitions (by number)	Total value of acquisitions [\$ Billions]	Proportion of all acquisitions (by value)	Average value of acquisitions [\$ MM]
1 All acquisitions	1,356	100.0%	1,893	100.0%	2,247.5	100.0%	1,193.6
2 All serial acquisitions	894	65.9%	1,424	75.2%	1,927.8	85.8%	1,357.6
3 Serial switchers	531	39.2%	950	50.2%	1,590.1	70.7%	1,674.7
4 Serial switchers - cash	531	39.2%	214	11.3%	157.5	7.0%	746.3
5 Serial switchers - stock	531	39.2%	736	38.9%	1,432.6	63.7%	1,946.9
6 Serial cash acquirers	223	16.4%	255	13.5%	233.6	10.4%	916.0
7 Serial stock acquirers	140	10.32%	219	11.57%	104.2	4.64%	477.9

**Table 2. Acquirer and target firm characteristics**

This table reports firm characteristics for the acquirers on all acquisitions, serial acquisitions, serial acquisitions with no pattern in the method of payment (serial switchers), serial acquirers consistently paying in cash, and in stock respectively. The sample consists of announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. Cash (stock) and serial acquirers are defined in Table 1. Panel A reports level variables for the acquirer reported at the closest quarter before the announcement date (Starting sample size: N=6,394 acquisitions). Panel B reports level variables for the target as reported by the closest quarter before the announcement date where information about the target is available (Starting sample size: N=1,356 acquisitions). All the firm-characteristic variables are industry-adjusted. Market capitalization (in MM \$) is the number of shares (in MM) multiplied by the closing stock price at the latest quarter before the acquisition announcement. We report three operating performance ratios: return on assets (ROA; earnings before income taxes plus depreciation (EBITD) divided by total assets), net income margin (net income divided by net sales), and quarterly sales growth (the change in net sales from two to one quarters prior to the acquisition announcement). Leverage is long term debt to total assets. The liquidity ratio is cash and cash equivalents divided by total assets. P-values for differences on means between the different types of acquirers are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance.

**Panel A. Acquirer firm characteristics (Industry-adjusted)**

Category	Variable levels (Quarter before Announcement Date)	Size	Operating performance			Leverage	Liquidity
		Market Cap [MM \$]	ROA (EBITD / Assets)	Net Income margin	Sales Growth (qtr-to-qtr)	Long-Term Debt / Total Assets	Cash and Cash- Equivalents / Total Assets
1	All acquisitions	2,783	0.009	-0.074	0.056	0.082	0.052
2	All serial acquisitions	3,259	0.012	-0.041	0.059	0.090	0.044
3	Serial switchers	4,429	0.013	-0.041	0.063	0.076	0.051
4	Serial switchers - cash	4,859	0.015	-0.009	0.054	0.094	0.040
5	Serial switchers – stock	3,887	0.011	-0.080	0.074	0.053	0.064
6	Serial cash acquirers	2,420	0.014	0.031	0.044	0.119	0.022
7	Serial stock acquirers	1,361	-0.011	-0.416	0.117	0.014	0.117
P-values for diff. between 4 vs. 5		< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>
P-values for diff. between 6 vs. 7		< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>	< <b>0.01</b>

**Panel B. Target firm characteristics (Industry-adjusted)**

Category	Variable levels (Quarter before Announcement Date)	Size	Operating performance			Leverage	Liquidity
		Market cap [MM \$]	ROA (EBITD / Assets)	Net Income margin	Sales Growth (qtr-to-qtr)	Long-Term Debt / Total Assets	Cash and Cash- Equivalents / Total Assets
1	All acquisitions	532	-0.004	-0.177	0.005	0.046	0.059
2	All serial acquisitions	585	-0.002	-0.150	0.009	0.043	0.061
3	Serial switchers	712	-0.001	-0.151	0.007	0.044	0.069
4	Serial switchers - cash	365	-0.006	-0.280	0.002	0.039	0.098
5	Serial switchers - stock	810	0.001	-0.113	0.009	0.046	0.060
6	Serial cash acquirers	421	0.006	-0.057	-0.002	0.045	0.035
7	Serial stock acquirers	215	-0.013	-0.258	0.028	0.034	0.056
P-values for diff. between 4 vs. 5		< <b>0.01</b>	<b>(0.06)</b>	<b>(0.03)</b>	(0.32)	(0.31)	< <b>0.01</b>
P-values for diff. between 6 vs. 7		<b>(0.02)</b>	< <b>0.01</b>	<b>(0.01)</b>	<b>(0.06)</b>	(0.21)	<b>(0.08)</b>

**Table 3. Acquirer overvaluation in serial acquisitions**

The table reports overvaluation proxies for acquirers in serial acquisitions. The initial sample consists of 16,440 announced serial acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. The subsamples include serial acquisitions with no pattern in the method of payment (serial switchers), serial acquirers consistently paying in cash, and in stock respectively. Cash (stock) and serial acquirers are defined in Table 1. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant.

Sub-Sample	Serial switchers			Serial non-switchers			Differences	
	Cash	Stock	Diff. (1) vs. (2)	Cash	Stock	Diff (3) vs. (4)	(1) vs. (3)	(2) vs. (4)
Method of payment in current acquisition	(1)	(2)		(3)	(4)			
N	4,241	3,344		7,413	1,442			
<b>Growth opportunities</b>								
Long-run growth Opportunities (RRV)	1.84	1.31	***	1.01	0.43	***	***	***
R&D / Total Assets	0.00	0.01	***	0.00	0.01	***	***	***
<b>Acquirer misvaluation</b>								
Stock returns (Mkt. adj.) over prior quarter	0.03	0.07	***	0.02	0.08	***	**	NS
Stock returns (Mkt. adj.) over prior year	0.04	0.06	***	0.03	0.09	***	*	**
Std. Dev. monthly stock returns prior year	0.13	0.14	***	0.12	0.18	***	***	***
Tobin's Q	2.27	3.08	***	1.80	3.76	***	***	***
Std. deviation of industry Tobin's Q	3.94	3.23	***	4.11	3.47	***	***	***
Industry sector-specific error (RRV)	-0.23	0.18	***	-0.08	0.12	***	***	***
Firm-specific error / Assets	0.43	0.94	***	0.22	1.57	***	***	***



**Table 4. Target overvaluation, level of competition, and target uncertainty in serial acquisitions**

The table reports overvaluation proxies for targets in serial acquisitions (Panel A), proxies for competition levels (Panel B), and proxies for uncertainty in target value (Panel C). The initial sample consists of 16,440 announced serial acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. The subsamples include serial acquisitions with no pattern in the method of payment (serial switchers), serial acquirers consistently paying in cash, and in stock respectively. Cash (stock) and serial acquirers are defined in Table 1. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant.

**Panel A. Target overvaluation proxies**

Sub-Sample	Serial Switchers		Diff.	Serial Non-Switchers		Diff.	Differences	
	Cash	Stock		Cash	Stock		(1) vs. (3)	(2) vs. (4)
Method of payment in current acquisition	(1)	(2)	(1) vs. (2)	(3)	(4)	(3) vs. (4)	(1) vs. (3)	(2) vs. (4)
N	4,241	3,344		7,413	1,442			
<b>Growth opportunities</b>								
Long-run growth Opportunities (RRV)	0.20	0.34	***	0.26	0.12	***	NS	*
R&D / Total Assets	0.01	0.01	NS	0.01	0.01	NS	***	NS
<b>Misvaluation</b>								
Stock returns (Mkt. adj.) over prior quarter	-0.04	-0.01	*	-0.01	-0.01	NS	NS	NS
Stock returns (Mkt. adj.) over prior year	0.04	0.05	NS	0.044	0.06	NS	NS	NS
Std. Dev. Monthly stock returns prior year	0.14	0.14	NS	0.13	0.15	NS	NS	NS
Tobin's Q	1.74	1.90	NS	1.59	2.14	***	NS	NS
Std. deviation of industry Tobin's Q	3.59	3.09	***	3.56	2.75	***	NS	*
Industry sector-specific error (RRV)	-0.10	0.15	***	-0.26	0.03	***	*	NS
Firm-specific error / Assets	0.08	0.28	**	0.11	0.42	**	NS	NS

**Panel B. Implied competition and auction cost proxies**

Sub-Sample	All serial acquirers			Serial Switchers			Serial Non-Switchers			Differences	
	Cash	Stock	Diff. (1) vs. (2)	Cash	Stock	Diff. (3) vs. (4)	Cash	Stock	Diff. (5) vs. (6)	(3) vs. (5)	(4) vs. (6)
Method of payment in current acquisition	(1)	(2)	(1) vs. (2)	(3)	(4)	(3) vs. (4)	(5)	(6)	(5) vs. (6)	(3) vs. (5)	(4) vs. (6)
N	11,654	4,786		4,241	3,344		7,413	1,442			
Buyout activity	0.32	0.29	***	0.31	0.26	***	0.32	0.30	***	***	**
Liquidity Index	0.24	0.21	***	0.20	0.18	**	0.16	0.26	NS	***	***
NBER Recession	0.12	0.04	***	0.09	0.05	***	0.14	0.03	***	***	*
LT debt ratio	0.14	0.12	*	0.12	0.13	NS	0.16	0.11	***	**	NS

**Panel C. Proxies for uncertainty in target valuations**

Sub-Sample	All serial acquirers			Serial Switchers			Serial Non-Switchers			Differences	
	Cash	Stock	Diff (1) vs. (2)	Cash	Stock	Diff. (3) vs. (4)	Cash	Stock	Diff. (5) vs. (6)	(3) vs. (5)	(4) vs. (6)
Method of payment in current acquisition	(1)	(2)		(3)	(4)		(5)	(6)			
N	469	955		214	736		255	219			
Ind.- Adj. Intangibles/ Total Assets	0.09	0.05	*	0.04	0.06	NS	0.13	0.03	***	NS	*
Intangible Assets/Total Assets	0.11	0.07	***	0.09	0.08	NS	0.12	0.05	***	NS	***
R&D/Total assets	0.01	0.01	NS	0.02	0.01	NS	0.11	0.02	NS	*	NS

**Table 5. Logistic regressions of the acquirer's decision to pay with cash**

This table reports logit models on the probability of choosing cash as the method of payment in an acquisition. The regression includes all serial acquirers including serial acquirers with no pattern in the method of payment (serial switchers) and serial acquirers consistently paying in cash and in stock respectively. The dependent variable in the models is a binary variable that equals one when the method of payment is cash and zero otherwise. The initial sample of all acquisitions consists of 21,123 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. Cash (stock) and serial acquirers are defined in Table 1. All firm characteristic variables are industry-adjusted, except for the variables related to stock returns, firm-specific and industry sector errors, and std. dev. of industry Tobin's Q. The logit regressions include intercepts (not reported) and use Eicker-Huber-White-Sandwich heteroskedastic-robust standard errors clustered by industry. Results are robust to clustering by both industry and year. \*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% levels, respectively.

Sample	All Acquisitions				Serial Acq.	Non-Serial Acq
Model	(1)	(2)	(3)	(4)	(5)	(6)
Serial Acquirer?	-0.113 (0.516)	-0.273 (0.330)	0.133 (0.431)	-0.301 (0.165)		
<b>Acquirer characteristics</b>						
log(Market capitalization)	-0.013 (0.110)			0.045 *** (0.002)	0.043 *** (0.006)	0.052 (0.379)
ROA (EBITD / Assets)	6.722 *** (0.004)			4.721 (0.142)	3.453 (0.295)	14.788 * (0.058)
Sales Growth (quarter-to-quarter)	-0.495 *** (0.000)			0.062 (0.891)	-0.082 (0.894)	-0.787 (0.388)
Long-Term Debt / Total Assets	1.119 ** (0.010)			1.237 ** (0.036)	1.359 ** (0.042)	2.214 (0.160)
Cash and Cash-Equivalents / Total Assets	0.769 ** (0.044)			1.385 (0.131)	1.453 (0.194)	2.798 (0.130)
Market-Adj. quarterly stock return prior quarter	-0.392 *** (0.008)			-1.589 *** (0.003)	-1.784 *** (0.002)	-0.815 (0.594)
Std. Dev. of Mkt-Adj. qtrly stock return prior year	-3.509 *** (0.009)			-7.399 *** (0.003)	-8.516 *** (0.002)	-5.289 (0.217)
Firm-Specific error (RRV) / Assets	-0.295 *** (0.000)			-0.397 *** (0.002)	-0.401 ** (0.014)	-0.629 (0.102)
Industry sector-Specific error (RRV)	-0.008 (0.152)			0.004 (0.755)	0.001 (0.938)	0.000 (0.995)
Std. Deviation of Industry Tobin's Q	0.241 *** (0.001)			0.144 (0.203)	0.207 (0.120)	-0.050 (0.830)
R&D / Total Assets	-16.479 *** (0.000)			-10.715 (0.167)	-2.256 (0.813)	-170.750 *** (0.004)
<b>Target characteristics</b>						
log(Market capitalization)		-0.173 *** (0.001)		-0.414 *** (0.000)	-0.466 *** (0.000)	-0.338 ** (0.010)
ROA (EBITD / Assets)		1.900 (0.435)		1.561 (0.626)	2.260 (0.595)	-2.709 (0.750)
Sales Growth (quarter-to-quarter)		-0.353 (0.117)		-0.196 (0.616)	0.323 (0.561)	-0.860 (0.536)
Long-Term Debt / Total Assets		-0.719 * (0.070)		-1.317 ** (0.032)	-0.949 (0.257)	-4.080 ** (0.017)
Cash and Cash-Equivalents / Total Assets		0.508 (0.394)		1.308 (0.114)	1.433 (0.131)	0.368 (0.827)
Market-Adj. quarterly stock return prior quarter		-0.066 (0.793)		0.445 (0.179)	0.904 * (0.067)	-0.423 (0.571)
Std. Dev. of Mkt-Adj. qtrly stock ret. prior year		-3.450 ** (0.029)		-2.697 (0.119)	-3.103 * (0.050)	-5.873 (0.128)
Firm-Specific error (RRV) / Assets		0.006 (0.945)		-0.096 (0.463)	-0.122 (0.424)	-0.724 (0.313)
Industry sector-Specific error (RRV)		-0.146 *** (0.002)		-0.177 *** (0.000)	-0.187 *** (0.001)	-0.197 (0.133)
Std. Deviation of Industry Tobin's Q		0.210 *** (0.000)		0.245 *** (0.002)	0.247 *** (0.009)	0.378 * (0.066)
R&D / Total Assets		-3.079 (0.309)		-4.666 (0.375)	-3.908 (0.547)	-23.298 * (0.062)
Intangible Assets/ Assets		0.255 * (0.063)		-0.023 (0.910)	0.542 * (0.071)	-1.417 * (0.064)
<b>Macroeconomic characteristics</b>						
US Stock market return in prior quarter			-0.764 * (0.090)	-3.128 ** (0.036)	-3.281 * (0.072)	-3.760 (0.127)
Average Volatility index prior 6 months			-0.061 *** (0.000)	-0.046 (0.189)	-0.029 (0.417)	-0.118 (0.104)
Std. dev. of Volatility index prior 6 months			0.183 *** (0.000)	0.057 (0.603)	0.055 (0.615)	0.121 (0.651)
Buyout Activity			0.897 *** (0.009)	1.323 *** (0.000)	1.600 *** (0.000)	0.912 (0.207)
Pseudo R <sup>2</sup>	0.105	0.052	0.011	0.198	0.230	0.253
Number of Observations	16,066	1,118	16,837	817	646	171

**Table 6. Proportion of cash acquisitions as a function of overvaluation and uncertainty**

This table reports the proportion of acquisitions that use cash as method of payment after splitting the sample based on overvaluation and uncertainty proxies. We classify a firm (acquirer or target) as highly overvalued if the overvaluation proxy is higher than the 75 percentile of the acquirer's overvaluation proxy distribution. We classify a target's value as highly uncertain if the uncertainty proxy is higher than the 75 percentile of the acquirer's overvaluation proxy distribution. Panels A and B split the sample based on overvaluation proxies for acquirers and targets respectively. Panel C splits the sample based on uncertainty proxies for acquirers and targets. In each panel, we further split the sample based on whether the acquirer's overvaluation is higher than the target's. The initial sample consists of 16,440 announced serial acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. The initial subsample with information on the overvaluation and uncertainty proxies for both acquirers and targets consists of 1,424 announced serial acquisitions. Cash (stock) and serial acquirers are defined in Table 1. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant.

**Panel A. Relative overvaluation and acquirer's degree of overvaluation**

Proportion of acquisitions that use cash as method of payment		Total	Acquirer < Target (1)	Acquirer > Target (2)	Diff. (1) - (2)
<b>Acquirer stock return (Mkt. adj.) prior quarter</b>	Total	0.3166	0.3561	0.2882	**
Acquirer degree of overvaluation	Low	0.3384	0.3651	0.3125	*
	High	0.2492	0.2833	0.2412	NS
Difference – Low-High		***	*	**	
<b>Acquirer stock return (Mkt. adj.) prior year</b>	Total	0.3254	0.3436	0.3077	*
Acquirer degree of overvaluation	Low	0.3562	0.3517	0.3626	NS
	High	0.2282	0.2656	0.2193	NS
Difference – Low-High		***	*	***	
<b>Acquirer Tobin's Q</b>		0.3218	0.3771	0.2974	***
Acquirer degree of overvaluation	Low	0.3475	0.4136	0.3133	***
	High	0.2409	0.1818	0.2557	NS
Difference – Low-High		***	***	*	
<b>Acquirer firm-specific error / Assets</b>	Total	0.3169	0.345	0.2985	*
Acquirer degree of overvaluation	Low	0.3452	0.3676	0.3267	NS
	High	0.2180	0.1607	0.2318	NS
Difference – Low-High		***	***	***	

**Panel B. Relative overvaluation and target degree of overvaluation**

Proportion of acquisitions that use cash as method of payment		Total	Acquirer < Target	Acquirer > Target	Diff. (1) - (2)
			(1)	(2)	
<b>Target stock return (Mkt. adj.) prior quarter</b>	Total	0.3312	0.3731	0.2990	***
Target degree of overvaluation	Low	0.3321	0.3771	0.3107	**
	High	0.3282	0.3679	0.1600	***
Difference – Low-High		NS	NS	***	
<b>Target stock return (Mkt. adj.) prior year</b>	Total	0.3326	0.3572	0.3089	**
Target degree of overvaluation	Low	0.3387	0.3598	0.3265	NS
	High	0.3166	0.3542	0.1613	***
Difference – Low-High		NS	NS	***	
<b>Target Tobin's Q</b>	Total	0.3335	0.3951	0.3049	***
Target degree of overvaluation	Low	0.3508	0.4478	0.3172	***
	High	0.2383	0.2793	0.1633	**
Difference – Low-High		***	***	***	
<b>Target firm-specific error / Assets</b>	Total	0.3318	0.3963	0.3032	***
Target degree of overvaluation	Low	0.3429	0.4435	0.3098	***
	High	0.2721	0.2965	0.2300	NS
Difference – Low-High		**	***	*	

**Panel C. Relative Overvaluation and uncertainty on target value**

Proportion of acquisitions that use cash as method of payment		Total	Acquirer < Target	Acquirer > Target	Diff. (1) - (2)
			(1)	(2)	
<b>Target (Industry-adjusted) Intangibles/ Assets</b>	Total	0.3294	0.375	0.2943	***
Degree of uncertainty on target value	Low	0.2991	0.3633	0.2467	***
	High	0.4146	0.4124	0.4161	NS
Difference – Low-High		***	NS	***	
<b>Target Intangibles/ Assets</b>	Total	0.3382	0.3647	0.3127	*
Degree of uncertainty on target value	Low	0.3057	0.3351	0.2752	*
	High	0.4291	0.4615	0.4040	NS
Difference – Low-High		***	**	***	
<b>Target R&amp;D/ Assets</b>	Total	0.3218	0.3771	0.2974	***
Degree of uncertainty on target value	Low	0.3078	0.3801	0.2778	***
	High	0.3595	0.3701	0.3539	NS
Difference – Low-High		*	NS	**	

**Table 7. Acquirer short- and long-term stock performance**

This table presents the short-term cumulative abnormal returns at the announcement date, calculated over a 7-day window centered at the announcement date, and long-term cumulative abnormal returns at the announcement date, calculated over a one-year window starting on the announcement date. We classify a firm (acquirer or target) as highly overvalued if the overvaluation proxy is higher than the 75 percentile of the acquirer's overvaluation proxy distribution. We classify a target's value as highly uncertain if the uncertainty proxy is higher than the 75 percentile of the acquirer's overvaluation proxy distribution. Panels A and B split the sample based on overvaluation proxies for acquirers and targets respectively. Panel C splits the sample based on uncertainty proxies for acquirers and targets. In each panel, we further split the sample based on whether the acquirer's overvaluation is higher than the target's. The initial sample consists of 16,440 announced serial acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. The subsample with information on the overvaluation and uncertainty proxies for both acquirers and targets consists of 1,424 announced serial acquisitions. Cash (stock) acquirers are defined in Table 1. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant. The number of observations are listed in square brackets.

**Panel A. Acquirer is NOT highly overvalued**

[N] Avg. CAR	Announcement period abnormal returns to acquirer			Long-horizon abnormal returns to acquirer		
	Paid with			Paid with		
	Stock	Cash	Diff.	Stock	Cash	Diff.
<b>Target is more overvalued than acquirer</b>						
Stock return (Mkt. adj.) prior quarter	[298] -0.0226	[172] 0.0029	0.0255 ***	-0.0722	0.0570	0.1292 ***
Stock return (Mkt. adj.) prior year	[389] -0.0251	[206] 0.0018	0.0269 ***	-0.0466	0.0595	0.1061 ***
Tobin's Q	[198] -0.0185	[141] -0.0042	0.0143 NS	-0.0831	0.1069	0.1900 ***
Firm-specific error / Assets	[282] -0.0180	[165] -0.0018	0.0162 **	-0.0596	0.0717	0.1313 ***
<b>Target is highly overvalued (and more overvalued than acquirer)</b>						
Stock return (Mkt. adj.) prior quarter	[100] -0.0198	[59] 0.0107	0.0305 ***	-0.0377	0.1212	0.1589 **
Stock return (Mkt. adj.) prior year	[131] -0.0210	[78] 0.0027	0.0237 **	-0.0894	0.0657	0.1551 ***
Tobin's Q	[63] -0.0270	[36] 0.0053	0.0323 **	-0.1723	0.0045	0.1768 **
Firm-specific Error / Assets	[70] -0.0151	[42] 0.0033	0.0184 NS	-0.2137	0.0869	0.3006 ***

**Panel B. Acquirer IS highly overvalued**

[N] Avg. CAR	Announcement period abnormal returns to acquirer			Long-horizon abnormal returns to acquirer		
	Paid with			Paid with		
	Stock	Cash	Diff.	Stock	Cash	Diff.
<b>Target is more overvalued than acquirer</b>						
Stock return (Mkt. adj.) prior quarter	[42] -0.0081	[17] 0.0220	-0.0139 NS	0.0446	0.1138	0.0692 NS
Stock return (Mkt. adj.) prior year	[46] -0.0164	[17] -0.0138	0.0026 NS	-0.0235	0.0385	0.0620 NS
Tobin's Q	[50] -0.0152	[12] -0.0087	0.0065 NS	0.2171	-0.0364	0.1807 NS
Firm-specific Error / Assets	[44] 0.0028	[9] 0.0329	0.0301 NS	-0.3053	0.2341	0.1313 NS
<b>Target is NOT more overvalued than acquirer</b>						
Stock return (Mkt. adj.) prior quarter	[191] -0.0172	[58] 0.0022	0.0194 NS	0.0281	0.1530	0.1249 *
Stock return (Mkt. adj.) prior year	[200] -0.0168	[57] -0.0164	0.0004 NS	-0.0832	0.1665	0.2497 ***
Tobin's Q	[190] -0.0229	[65] -0.0622	0.0119 NS	-0.0056	0.0146	0.0202 NS
Firm-specific Error / Assets	[178] -0.0279	[51] -0.0064	0.0215 NS	0.0324	-0.0018	-0.0342 NS

**Table 8. Frequency distribution of changes in the method of payment by serial acquirers**

This table reports the frequency distribution of the method of payment in subsequent acquisitions, conditional on the method of payment in the prior acquisition within a block of serial acquisitions. Acquirers are classified into serial acquirers, serial acquirers with no pattern in the method of payment (serial switchers), and serial acquirers consistently paying in cash and in stock respectively. Cash (stock) and serial acquirers are defined in Table 1. The initial sample of subsequent serial acquisitions within each serial acquisition block consists of 12,494 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. Panel A examines the decision to switch or stay with same method of payment in all subsequent acquisitions within a block of a series of acquisitions. Panels B and Panel C examine subsamples of close and distant acquisitions respectively. An acquisition is classified as close in calendar time if the number of days from the prior acquisition is less than 365 days and as a distant subsequent acquisition if the length is between 1 and 3 years. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant.

**Panel A. Frequency distribution of method of payment, conditional on payment method in prior acquisition**

Method of payment in prior acquisition: Method of payment in current acquisition		Cash			Stock		
		All	Cash	Stock	All	Stock	Cash
# All serial acquisitions	12,494	8,750	7,567	1,183	3,744	2,441	1,303
			86%	14%		65%	35%
Serial switchers	6,201	3,416	2,233	1,183	2,785	1,482	1,303
			65%	35%		53%	47%
Serial cash acquirers	5,334	5,334	5,334				
Serial stock acquirers	959				959	959	

**Panel B. Frequency distribution of method of payment, conditional on payment method in prior acquisition – Close acquisitions**

Method of payment in prior acquisition: Method of payment in current acquisition		Cash			Stock		
		All	Cash	Stock	All	Stock	Cash
# All serial acquisitions	8,786	6,077	5,282	795	2,709	1,899	810
			87%	13%		70%	30%
Serial switchers	4,486	2,466	1,671	795	2,020	1,210	810
			68%	32%		60%	40%
Serial cash acquirers	3,611	3,611	3,611				
Serial stock acquirers	689				689	689	

**Panel C. Frequency distribution of method of payment, conditional on payment method in prior acquisition – Distant acquisitions**

Method of payment in prior acquisition: Method of payment in current acquisition		Cash			Stock		
		All	Cash	Stock	All	Stock	Cash
# All serial acquisitions	3,708	2,673	2,285	388	1,035	542	493
			85%	15%		52%	48%
Serial switchers	1,715	950	562	388	765	272	493
			59%	41%		36%	64%
Serial cash acquirers	1,723	1,723	1,723				
Serial stock acquirers	270				270		270



### **Table 9. Logistic regressions of the decision to switch the method of payment**

This table reports logit models on the probability of switching the method of payment (stock into cash or cash into stock). The regression includes all serial acquirers including serial acquirers with no pattern in the method of payment (serial switchers) and serial acquirers consistently paying in cash and in stock respectively. Cash (stock) and serial acquirers are defined in Table 1. The initial sample of subsequent serial acquisitions consists of 12,510 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. To control for the difference in days from the prior and the current acquisition, the models examine the acquisitions after the first deal in the series of acquisitions. Panel A (Panel B) examines the acquisitions in which the acquirer paid with stock (cash) in the prior acquisition of that serial acquisition block. All firm characteristic variables are industry adjusted, except for the variables related to stock returns, firm-specific and industry sector errors, and std. dev. of industry Tobin's Q. The logit regressions include intercepts (not reported). Model 5 omits the "subsidiary target" dummy and includes the "public" and "private" dummies. The logit regressions use Eicker-Huber-White-Sandwich heteroskedastic-robust standard errors clustered by industry. \*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% levels, respectively.

**Panel A. Decision to switch from stock to cash**

Model	(1)	(2)	(3)	(4)	(5)	(6)
<b>Acquirer characteristics</b>						
log(Market capitalization)	-0.004 (0.749)			0.035 *** (0.002)	0.003 (0.702)	0.033 ** (0.040)
ROA (EBITD / Assets)	8.292 *** (0.000)			-14.458 ** (0.031)	7.106 *** (0.000)	-26.637 *** (0.000)
Sales Growth (quarter-to-quarter)	-0.365 ** (0.010)			0.024 (0.884)	-0.267 (0.142)	0.158 (0.469)
Long-Term Debt / Total Assets	1.386 *** (0.000)			0.148 (0.956)	0.479 (0.142)	0.227 (0.886)
Cash and Cash-Equivalents / Total Assets	1.307 *** (0.000)			10.290 ** (0.019)	1.729 *** (0.000)	11.615 *** (0.004)
Market-Adj. quarterly stock return prior quarter	-0.633 *** (0.000)			-2.072 ** (0.049)	-0.579 *** (0.000)	-1.885 * (0.078)
Std. Dev. of Mkt-Adj. qtrly stock ret. prior year	-1.575 (0.236)			-9.921 * (0.054)	-1.381 (0.277)	-3.361 * (0.088)
Firm-Specific error (RRV) / Assets	-0.242 *** (0.000)			-0.768 ** (0.019)	-0.237 *** (0.000)	-0.875 *** (0.007)
Industry sector-Specific error (RRV)	-0.002 (0.840)			-0.013 (0.527)	-0.001 (0.914)	-0.011 (0.516)
Std. Deviation of Industry Tobin's Q	0.197 *** (0.000)			0.422 *** (0.006)	0.172 *** (0.000)	0.175 (0.318)
R&D / Total Assets	-13.165 ** (0.015)			-60.948 *** (0.001)	-12.851 ** (0.029)	-90.691 *** (0.003)
<b>Target characteristics</b>						
log(Market capitalization)		-0.078 (0.692)		-0.520 *** (0.005)		-0.873 *** (0.000)
ROA (EBITD / Assets)		3.002 (0.687)		33.430 *** (0.000)		40.961 *** (0.000)
Sales Growth (quarter-to-quarter)		-0.173 (0.876)		0.985 (0.176)		0.936 (0.132)
Long-Term Debt / Total Assets		1.605 (0.113)		2.291 *** (0.000)		2.407 *** (0.002)
Cash and Cash-Equivalents / Total Assets		3.193 *** (0.009)		3.926 * (0.081)		4.104 (0.207)
Market-Adj. quarterly stock return prior quarter		-0.426 (0.565)		2.987 * (0.059)		2.770 (0.103)
Std. Dev. of Mkt-Adj. qtrly stock ret. prior year		-6.399 ** (0.042)		-12.050 ** (0.015)		-15.590 ** (0.017)
Firm-Specific error (RRV) / Assets		-0.074 (0.756)		0.033 (0.865)		0.053 (0.782)
Industry sector-Specific error (RRV)		-0.087 (0.503)		-0.172 * (0.097)		-0.260 ** (0.024)
Std. Deviation of Industry Tobin's Q		0.224 ** (0.015)		0.330 * (0.097)		0.545 * (0.074)
R&D / Total Assets		-13.574 (0.418)		-51.941 *** (0.000)		-59.165 *** (0.001)
Intangible Assets/ Assets		1.179 (0.120)		2.229 *** (0.003)		1.661 ** (0.035)
<b>Macroeconomic variables</b>						
US Stock market return in prior quarter			-0.809 * (0.068)	-2.996 * (0.081)	-0.005 (0.992)	-2.878 (0.115)
Average Volatility index prior 6 months			-0.021 * (0.053)	0.076 (0.165)	-0.005 (0.758)	0.105 ** (0.013)
Std. dev. of Volatility index prior 6 months			0.132 *** (0.002)	-0.459 ** (0.025)	0.069 * (0.077)	-0.453 *** (0.006)
Buyout activity			0.316 (0.363)	2.636 *** (0.000)	-0.048 (0.910)	2.188 *** (0.000)

**Serial acquisition characteristics**

More than one year from prior acquisition					0.567 ***	0.652 **
					(0.000)	(0.013)
Proportion of prior acquisitions in cash					-0.032 ***	0.009
					(0.000)	(0.660)
Number of prior acquisitions in serial block					1.915 ***	3.081 ***
					(0.000)	(0.000)
Public target in current acquisition					-2.871 ***	
					(0.000)	
Private target in current acquisition					-2.035 ***	
					(0.000)	
Pseudo R <sup>2</sup> [N Observations]	0.077 [3335]	0.065 [351]	0.005 [3608]	0.298 [298]	0.246 [2744]	0.336 [275]

**Panel B. Decision to switch from cash to stock**

Model	(1)	(2)	(3)	(4)	(5)	(6)
<b>Acquirer characteristics</b>						
log(Market capitalization)	0.025 *** (0.000)			-0.042 (0.180)	0.010 (0.133)	-0.049 ** (0.034)
ROA (EBITD / Assets)	-3.768 (0.159)			-4.099 (0.407)	-2.243 (0.259)	-4.025 (0.491)
Sales Growth (quarter-to-quarter)	0.467 *** (0.003)			1.247 (0.177)	0.287 (0.227)	0.977 (0.307)
Long-Term Debt / Total Assets	-0.662 (0.276)			0.975 (0.374)	-0.314 (0.542)	1.391 (0.286)
Cash and Cash-Equivalents / Total Assets	-0.681 (0.191)			1.328 (0.426)	-0.436 (0.266)	1.396 (0.399)
Market-Adj. quarterly stock return prior quarter	0.433 ** (0.049)			0.764 (0.495)	0.459 ** (0.034)	0.619 (0.580)
Std. Dev. of Mkt-Adj. qtrly stock ret. prior year	2.716 * (0.065)			6.145 (0.249)	4.438 *** (0.000)	5.444 (0.314)
Firm-Specific error (RRV) / Assets	0.302 *** (0.000)			0.241 * (0.060)	0.315 *** (0.000)	0.201 * (0.95)
Industry sector-Specific error (RRV)	0.004 (0.516)			-0.012 (0.481)	0.005 (0.409)	-0.011 (0.538)
Std. Deviation of Industry Tobin's Q	-0.222 *** (0.001)			-0.037 (0.817)	-0.237 *** (0.000)	0.000 *** (0.000)
R&D / Total Assets	15.937 *** (0.000)			6.949 (0.456)	6.991 *** (0.003)	7.272 (0.423)
<b>Target characteristics</b>						
log(Market capitalization)		0.213 *** (0.004)		0.490 *** (0.000)		0.565 *** (0.000)
ROA (EBITD / Assets)		-0.972 (0.761)		-1.415 (0.781)		-2.685 (0.565)
Sales Growth (quarter-to-quarter)		0.360 (0.544)		0.523 (0.576)		0.373 (0.720)
Long-Term Debt / Total Assets		1.383 (0.102)		2.437 ** (0.036)		2.188 * (0.067)
Cash and Cash-Equivalents / Total Assets		-0.342 (0.611)		-1.068 (0.413)		-1.186 (0.392)
Market-Adj. quarterly stock return prior quarter		-0.760 * (0.093)		-0.767 (0.184)		-0.805 (0.265)
Std. Dev. of Mkt-Adj. qtrly stock ret. prior year		4.487 *** (0.002)		5.324 ** (0.027)		4.943 * (0.072)
Firm-Specific error (RRV) / Assets		-0.013 (0.907)		0.160 (0.337)		0.209 (0.186)
Industry sector-Specific error (RRV)		0.110 * (0.050)		0.169 ** (0.013)		0.184 *** (0.009)
Std. Deviation of Industry Tobin's Q		-0.203 *** (0.001)		-0.304 ** (0.031)		-0.307 *** (0.000)
R&D / Total Assets		4.377 (0.296)		-0.076 (0.994)		-4.623 (0.685)
Intangible Assets/ Assets		-0.213 (0.448)		-0.747 (0.153)		-0.808 (0.196)
<b>Macroeconomic variables</b>						
US Stock market return in prior quarter			-0.350 (0.537)	2.488 (0.229)	0.029 (0.956)	3.572 * (0.097)
Average Volatility index prior 6 months			0.050 ** (0.019)	0.010 (0.863)	0.058 *** (0.000)	0.013 (0.819)
Std. dev. of Volatility index prior 6 months			-0.139 *** (0.006)	-0.138 (0.326)	-0.202 *** (0.000)	-0.156 (0.273)
Buyout Activity			-1.031 ** (0.014)	-1.580 ** (0.014)	-0.670 ** (0.024)	-1.573 ** (0.041)

**Serial acquisition characteristics**

More than one year from prior acquisition					0.159 (0.106)	-0.111 (0.678)
Proportion of prior acquisitions in cash					-0.038 *** (0.004)	-0.050 ** (0.045)
Number of prior acquisitions in serial block					-2.012 *** (0.000)	-1.522 * (0.063)
Public target in current acquisition					2.792 *** (0.000)	
Private target in current acquisition					1.372 *** (0.000)	
<hr/>						
Pseudo R2 [N Observations]	0.065 [7710]	0.07 [373]	0.008 [8352]	0.225 [253]	0.237 [5717]	0.256 [275]

**Table 10. Target and acquirer overvaluation changes in close and distant serial acquisitions**

This table reports the changes in overvaluation proxies for the targets and acquirers in serial acquisitions that are close in calendar time, for three different subsamples, (i) acquisitions in which the serial switchers switch the method of payment in the current acquisition, (ii) acquisitions in which the serial switchers do not switch the method of payment, and (iii) acquisitions by serial cash-only and serial stock-only acquirers who, ex post never switch the method of payment, but who faced the decision to switch between the prior to the current acquisition. The sample consists of 16,440 announced serial acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. The sample for which we have information on the current target is 1,424 acquisitions. Changes in the overvaluation proxies are estimated by comparing the target in the prior acquisition and the target in the current acquisition, as reported at the closest quarter before the announcement date, conditioned on having information on both targets. An acquisition is defined as close when the difference in days between the prior acquisition and the current acquisition is separated at the most by 365 days. An acquisition is defined as distant when the difference in days between the prior acquisition and the current acquisition is between 1 and 3 years. Cash (stock) and serial acquirers are defined in Table 1. \*\*\*, \*\*, \* denote significance at 1%, 5% and 10% levels, based on the P-values for differences on means between the different types of acquirers. P-values are computed using a t-test (Satterthwaite, 1946) on the equality of means assuming that unpaired data have unequal variance. NS implies the difference is not significant.

**Panel A: Close serial acquisitions**

Sub-Sample	Switchers that switch in current deal			Switchers that do not switch in current deal			Non-switchers (Never switch)			Differences			
	Stock	Cash		Cash	Stock		Cash	Stock		(2) vs. (3)	(1) vs. (4)	(1) vs. (6)	(2) vs. (5)
Method of payment in prior acquisition:													
Method of payment in current acquisition	Cash	Stock	Diff.	Cash	Stock	Diff.	Cash	Stock	Diff.				
	(1)	(2)		(3)	(4)		(5)	(6)					
<b>Levels of acquirer overvaluation proxies</b>													
N	810	795		1,671	1,210		3,611	689					
Stock return (Mkt. adj.) prior qtr	0.028	0.070	***	0.030	0.072	***	0.017	0.079	***	***	***	***	***
Stock-return (Mkt. adj.) prior year	0.033	0.051	**	0.035	0.052	NS	0.033	0.076	***	*	*	***	**
Tobin's Q	2.377	3.314	***	2.208	3.674	***	1.750	3.963	***	***	**	***	***
Firm-specific Error (RRV)/ Assets	0.449	0.994	***	0.319	1.162	***	0.182	1.714	***	***	**	***	***
<b>Changes of acquirer overvaluation proxies</b>													
N	810	795		1,671	1,210		3,611	689					
Δ Stock-return (Mkt. adj.) prior quarter	-0.017	-0.011	NS	-0.004	-0.025	**	-0.004	-0.058	***	NS	NS	**	NS
Δ Stock-return (Mkt. adj.) prior year	-0.019	-0.026	NS	-0.011	-0.024	NS	-0.014	-0.083	***	NS	NS	***	NS
ΔTobin's Q	-0.107	-0.075	NS	-0.071	-0.094	NS	-0.048	-0.310	***	NS	NS	**	NS
Δ Firm-specific Error (RRV)/ Assets	-0.064	-0.069	NS	-0.023	-0.081	*	-0.031	-0.181	**	*	NS	*	NS
<b>Changes of target overvaluation proxies</b>													
N	137	143	NS	165	455	NS	119	135					
Δ Stock return (Mkt. adj.) prior quarter	-0.013	0.012	NS	-0.051	0.003	NS	-0.074	0.033	NS	NS	NS	NS	NS
Δ Stock-return (Mkt. adj.) prior year	-0.037	-0.040	NS	-0.098	-0.048	NS	0.065	0.016	NS	NS	NS	NS	NS
Δ Tobin's Q	0.087	0.135	NS	0.550	0.033	NS	-0.322	0.332	NS	NS	NS	NS	NS
Δ Firm-specific Error (RRV)/ Assets	-0.045	0.085	NS	0.236	0.133	NS	0.214	0.236	NS	NS	NS	NS	NS

**Panel B: Distant serial acquisitions**

Sub-Sample	Switchers that switch in current deal			Switchers that do not switch in current deal			Non-switchers (Never switch)			Differences			
	Stock	Cash		Cash	Stock		Cash	Stock		(2) vs. (3)	(1) vs. (4)	(1) vs. (6)	(2) vs. (5)
Method of payment in prior acquisition:	Stock	Cash		Cash	Stock		Cash	Stock					
Method of payment in current acquisition	Cash	Stock	Diff.	Cash	Stock	Diff.	Cash	Stock	Diff.				
	(1)	(2)		(3)	(4)		(5)	(6)					
<b>Levels of acquirer overvaluation proxies</b>													
N	493	388		562	272		1,723	270					
Stock return (Mkt. Adj.) prior qtr	0.011	0.062	***	0.014	0.071	***	0.008	0.025	NS	***	***	NS	****
Stock-return (Mkt. Adj.) prior yr	0.039	0.070	**	0.034	0.058	NS	0.018	0.057	*	**	NS	NS	***
Tobin's Q	2.048	2.353	***	1.971	2.453	***	1.749	2.768	***	***	***	***	***
Firm-specific Error (RRV)/ Assets	0.314	0.624	***	0.248	0.698	***	0.184	0.897	***	***	***	***	***
<b>Changes of acquirer overvaluation proxies</b>													
N	493	388		562	272		1,723	270					
Δ Stock-return (Mkt. Adj.) prior quarter	-0.029	0.022	***	-0.002	0.017	NS	-0.019	-0.034	NS	NS	*	NS	***
Δ Stock-return (Mkt. Adj.) prior year	0.003	0.018	NS	0.013	0.022	NS	-0.012	-0.045	NS	NS	NS	NS	*
Δ Tobin's Q	-0.329	-0.062	***	-0.131	-0.227	NS	-0.175	-0.613	***	NS	NS	*	*
Δ Firm-specific Error (RRV)/ Assets	-0.259	-0.019	***	-0.134	-0.204	NS	-0.121	-0.407	**	*	NS	NS	*
<b>Changes of target overvaluation proxies</b>													
N	74	60		67	122		74	55					
Δ Stock return (Mkt. Adj.) prior quarter	0.004	-0.001	NS	0.059	-0.048	NS	-0.023	-0.116	NS	NS	NS	NS	NS
Δ Stock-return (Mkt. Adj.) prior year	0.052	-0.105	NS	0.181	-0.127	NS	-0.110	-0.148	NS	NS	NS	NS	NS
Δ Tobin's Q	-0.305	-0.416	NS	-1.705	-0.501	NS	-0.154	-2.336	NS	NS	NS	NS	NS
Δ Firm-specific Error (RRV)/ Assets	-0.513	0.438	**	-1.287	0.058	NS	0.479	-1.806	*	NS	NS	NS	NS

**Table 11. Decision to switch method of payment conditional on the time since prior acquisition**

This table reports logit models on the probability of switching the method of payment (stock into cash or cash into stock). The regression includes all serial acquirers including serial acquirers with no pattern in the method of payment (serial switchers) and serial acquirers consistently paying in cash and in stock respectively. Cash (stock) and serial acquirers are defined in Table 1. The initial sample of subsequent serial acquisitions consists of 12,510 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. Close and distant acquisitions are defined in Table 4. To control for the difference in days from the prior and the current acquisition, the models examine the acquisitions after the first deal in the series of acquisitions. Panel A examines the decision to switch based on acquirer characteristics and changes in acquirer characteristics. Owing to reduction in sample sizes, Panel B examines the decision to switch based on target characteristic levels only. All firm characteristic variables are industry adjusted, except for the variables related to stock returns, firm-specific and industry sector errors, and std. dev. of industry Tobin's Q. The logit regressions use Eicker-Huber-White-Sandwich heteroskedastic-robust standard errors clustered by industry. \*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% levels, respectively.

**Panel A. Decision to switch as a function of acquirer characteristics**

Distance in calendar time from prior acquisition	Close	Distant	Close	Distant
	[<1 yr]	[1 yr, 3 yrs]	[<1 yr]	[1 yr, 3 yrs]
Method of payment in prior acquisition	Stock		Cash	
Decision	P[pay with cash   prior stock]		P[pay with stock   prior cash]	
Model	(1)	(2)	(3)	(4)
log(Market capitalization)	0.020 (0.104)	0.057 *** (0.000)	-0.020 * (0.077)	-0.036 *** (0.003)
Long-Term Debt / Total Assets	1.811 *** (0.003)	1.212 ** (0.022)	-1.331 (0.111)	-0.729 (0.290)
Cash and Cash-Equivalents / Total Assets	1.085 ** (0.011)	1.255 ** (0.023)	0.741 ** (0.016)	-0.013 (0.980)
Market-Adj. quarterly stock return prior quarter	-0.602 *** (0.001)	-0.474 (0.204)	0.671 *** (0.002)	1.211 ** (0.023)
Firm-Specific error (RRV) / Assets	-0.171 *** (0.000)	-0.230 ** (0.010)	0.354 *** (0.000)	0.135 * (0.071)
R&D / Assets	-7.916 ** (0.032)	-11.444 *** (0.000)	3.628 (0.303)	11.472 * (0.084)
$\Delta$ Cash and Cash-Equivalents / Total Assets	0.954 ** (0.037)	0.624 * (0.86)	-0.861 * (0.100)	-1.180 ** (0.045)
$\Delta$ Market-Adj. quarterly stock return prior quarter	0.278 (0.333)	-0.254 (0.408)	-0.148 (0.561)	-0.215 (0.652)
$\Delta$ Firm-Specific error (RRV) / Assets	0.026 (0.545)	-0.016 (0.836)	-0.159 *** (0.002)	0.190 * (0.093)
$\Delta$ R&D / Assets	3.860 (0.237)	3.159 (0.370)	-0.355 (0.921)	0.402 (0.950)
Public target in current acquisition	-3.020 *** (0.000)	-2.492 *** (0.000)	2.811 *** (0.000)	2.866 *** (0.000)
Private target in current acquisition	-2.218 *** (0.000)	-1.784 *** (0.000)	1.309 *** (0.000)	1.401 *** (0.000)
Intercept	1.208 *** (0.000)	1.493 *** (0.000)	-3.167 *** (0.000)	-3.164 *** (0.000)
Pseudo R <sup>2</sup> [N Observations]	0.182 [2331]	0.160 [905]	0.161 [4853]	0.175 [2341]



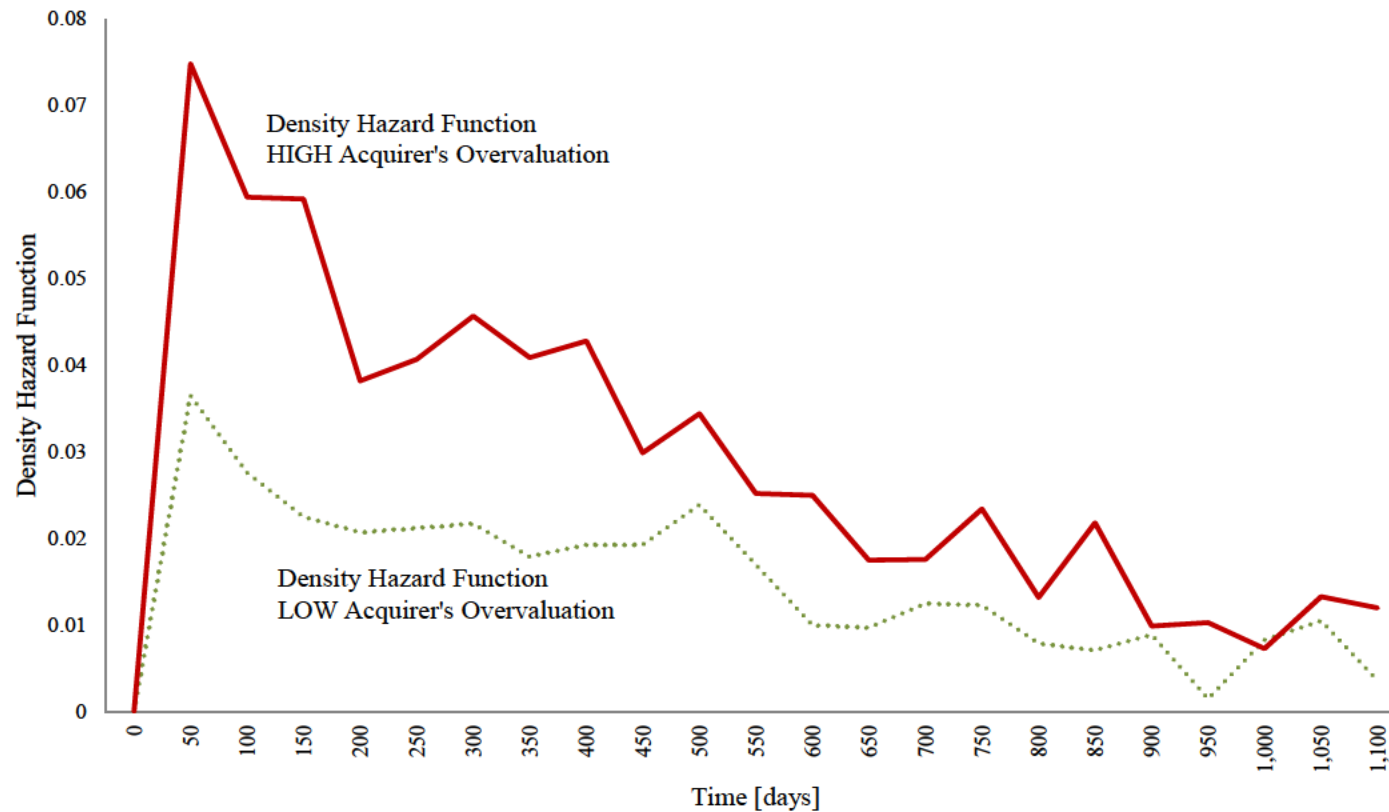
**Panel B. Decision to switch as a function of target characteristics**

Distance in calendar time from prior acquisition	Close	Distant	Close	Distant
	[<1 yr]	[1 yr, 3 yrs]	[<1 yr]	[1 yr, 3 yrs]
Method of payment in prior acquisition	Stock		Cash	
Decision	P[pay with cash   prior stock]		P[pay with stock   prior cash]	
Model	(1)	(2)	(3)	(4)
log(Market capitalization)	-0.192 (0.259)	-0.515 (0.193)	0.199 *** (0.007)	0.250 * (0.059)
Long-Term Debt / Total Assets	2.802 ** (0.010)	-0.290 (0.852)	2.172 * (0.051)	1.222 (0.299)
Market-Adj. quarterly stock return prior quarter	0.064 (0.926)	-0.885 (0.531)	-0.368 (0.584)	-0.933 (0.154)
Std. Dev. of Mkt-Adj. quarterly stock ret. prior year	-8.460 *** (0.003)	-4.475 (0.300)	8.579 *** (0.004)	1.081 (0.475)
Firm-Specific error (RRV) / Assets	-0.132 (0.799)	0.397 (0.182)	0.037 (0.806)	-0.134 (0.471)
Industry sector-Specific error (RRV)	0.000 (0.760)	-0.002 (0.612)	0.001 (0.114)	0.002 ** (0.010)
Std. Deviation of Industry Tobin's Q	0.364 *** (0.002)	0.278 (0.117)	-0.301 *** (0.000)	-0.136 (0.252)
R&D / Total Assets	-8.154 (0.604)	-35.256 ** (0.021)	-0.079 (0.987)	7.909 ** (0.043)
Intangible Assets/ Assets	2.691 ** (0.038)	-0.510 (0.509)	-0.446 (0.303)	-0.095 (0.846)
Sales Growth (quarter-to-quarter)	-2.187 *** (0.000)	-1.427 *** (0.000)	-0.092 (0.727)	-0.075 (0.869)
Pseudo R <sup>2</sup>	0.086	0.096	0.114	0.060
Number of Observations	250	93	232	150

**Table 12. Duration Analysis: Estimating the probability of the acquirer's decision to pay with stock over cash in event time**

This table reports the results of a duration analysis on the decision to pay with stock over cash for the acquirers on subsequent acquisitions. The initial sample of all subsequent acquisitions consists of 14,435 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. An acquisition is classified as a cash (stock) acquisition if the percentage of payment in cash (stock) is greater than 80%. An acquisition is classified as a subsequent acquisition if the acquirer has ever made a prior acquisition since 1980. Each spell starts with the date of the prior acquisition and ends on the date of the current acquisition. "Failure" is defined as one if the acquirer uses stock over cash in the current acquisition. Models 1 and 2 examine the survival function using parametric log-logistic models. The accelerated failure time metric assumes a similar hazard curve of the same shape and assesses whether the risk has a faster or slower risk of occurrence. Models 3 and 4 examine the hazard function using semi-parametric cox models. The proportional hazard metric assumes that the hazard of a subject is some proportion larger or smaller than the hazard of another subject. All the firm-characteristic variables are industry-adjusted, except for the variables related to stock returns, firm-specific and industry sector errors, and Std. dev. of Industry Tobin's Q. An acquisition is classified as a serial acquisition if the acquirer has made a prior acquisition within 3 years of the current acquisition. Models include a dummy for the public and private targets and, for identification purposes, omit a subsidiary target dummy. The semi-parametric Cox Models 3 and 4 do not include intercepts. All the models use Eicker-Huber-White-Sandwich heteroskedastic-robust standard errors clustered by industry. \*\*\*, \*\*, \* denotes significance at 1%, 5% and 10% levels, respectively.

Function	Survival Function		Hazard Function	
	Accelerated Failure Time		Proportional Hazard Model	
	Parametric		Semi-Parametric	
	Log-Logistic distribution		Cox Model	
Parameterization	(1)	(2)	(3)	(4)
	Survival ratio / (p)	Survival ratio / (p)	Hazard ratio / (p)	Hazard ratio (p)
log(Market capitalization)	-0.025*** (0.003)	-0.030*** (0.000)	0.013** (0.016)	0.016*** (0.005)
ROA (EBITD / Assets)	4.468*** (0.001)	4.380*** (0.001)	-3.584*** (0.001)	-3.228*** (0.003)
Sales Growth (quarter-to-quarter)	-0.755*** (0.000)	-0.659*** (0.000)	0.501*** (0.000)	0.449*** (0.000)
Long-Term Debt / Total Assets	0.673* (0.063)	0.630* (0.091)	-0.596* (0.050)	-0.533 (0.104)
Cash and Cash-Equivalents / Total Assets	0.281 (0.282)	0.302 (0.252)	-0.249 (0.257)	-0.243 (0.263)
Market-adj. quarterly stock return prior quarter	-0.578*** (0.000)	-0.548*** (0.000)	0.395*** (0.000)	0.396*** (0.000)
Std. Dev. of Market-adj. quarterly stock return prior year	-4.941*** (0.000)	-5.054*** (0.000)	3.583*** (0.000)	3.646*** (0.000)
Firm-Specific error (RRV) / Assets	-0.055*** (0.000)	-0.049*** (0.000)	0.041*** (0.000)	0.037*** (0.000)
Industry sector-Specific error (RRV)	-0.006 (0.406)	-0.003 (0.723)	0.005 (0.319)	0.004 (0.495)
Std. Deviation of Industry Tobin's Q	0.277*** (0.000)	0.273*** (0.000)	-0.207*** (0.000)	-0.201*** (0.000)
R&D / Total Assets	-0.263*** (0.003)	-0.323*** (0.000)	0.203** (0.012)	0.246*** (0.002)
Public target	-2.366*** (0.000)	-2.405*** (0.000)	2.028*** (0.000)	2.038*** (0.000)
Private Target	-1.895*** (0.000)	-1.895*** (0.000)	1.597*** (0.000)	1.597*** (0.000)
Serial Acquisition	-2.175*** (0.000)	-2.106*** (0.000)	1.561*** (0.000)	1.470*** (0.000)
US Stock market return in prior quarter		-1.400*** (0.000)		1.181*** (0.000)
Average Volatility index prior 6 months		-0.046*** (0.000)		0.029*** (0.001)
Std. dev. of Volatility index prior 6 months		0.177*** (0.000)		-0.128*** (0.000)
Buyout Activity		0.690*** (0.001)		-0.446*** (0.002)
Intercept	10.869*** (0.000)	11.154*** (0.000)		
Log likelihood	-8,936.75	-7,936.82	-25,418.47	-22,573.86
$\chi^2$	2,149.47	2,591.50	2,361.20	2,627.17
Prob > $\chi^2$	0.000	0.000	0.000	0.000
Number of acquisitions	10,969	9,638	10,969	9,638
Number of failures (i.e., stock payment)	3,148	2,851	3,148	2,851



**Figure 1. Duration analysis: Density hazard function of the acquirer’s decision to pay with stock over cash in event time**

This figure reports the density hazard function on the decision of choosing to pay with stock over cash for the acquirers on subsequent acquisitions. We classify each acquirer as a high- or low-overvaluation after splitting the sample based on above- and below-median firm’s specific error, where the medians are estimated each year. The initial sample of all subsequent acquisitions consists of 14,435 announced acquisitions of US public acquirers and US targets (public, private and subsidiaries) between 1980 and 2010. An acquisition is classified as a cash (stock) acquisition if the percentage of payment in cash (stock) is greater than 80%. An acquisition is classified as a subsequent acquisition if the acquirer has ever made a prior acquisition since 1980. Each spell starts with the date of the prior acquisition and ends on the date of the current acquisition. We classify an acquirer as a firm with high (low) overvaluation if the acquirer’s specific error divided by assets is in the fourth (first) quartile of the whole sample. “Failure” is defined as one if the acquirer uses stock over cash in the current acquisition. The left axis reports the cumulative scale and the right axis the density scale. The horizontal axis is measured in days.