Are Overconfident Managers Born or Made?
Evidence of Self-Attribution Bias from Frequent Acquirers

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Abstract

We explore the source of managerial hubris in mergers and acquisitions by examining the history of deals made by individual acquirers. Our study has three main findings: (1) Compared to their first deals, acquirers of second and higher-order deals experience significantly more negative announcement effects; (2) While acquisition likelihood increases in the performance associated with previous acquisitions, previous positive performance does not curb the negative wealth effects associated with future deals; (3) Top management's net purchase of stock is greater preceding high order deals than it is for first deals. We interpret these results as consistent with self-attribution bias leading to managerial overconfidence. We also find evidence that the market anticipates future deals based on an acquirer's acquisition history and impounds such anticipation into stock prices.

JEL Classifications: G31; G32; G34

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1. Introduction

Roll's (1986) hubris hypothesis suggests managers engage in acquisitions with an overly optimistic opinion of their ability to create value. A number of papers have documented evidence supporting this hypothesis.[1] One unanswered question, however, is how do managers become overconfident? Managers could simply be born overconfident. Alternatively, they may develop overconfidence through experience. The source of overconfidence has important implications for corporate governance. If managers develop overconfidence through experience, remedies such as monitoring and incentives should be adjusted based on managers' experience. On the other hand, if managers have endowed overconfidence, no such adjustment is needed.

The psychology and behavioral economics literatures document one common source of overconfidence: self-attribution bias.[2] Individuals subject to self-attribution bias over credit their role in bringing about good outcomes and over credit external factors or bad luck for bad outcomes. Hirshleifer (2001) summarizes the link between overconfidence and self-attribution bias: "Overconfidence and biased self-attribution are static and dynamic counterparts; self-attribution causes individuals to learn to be overconfident rather than converging to an accurate self-assessment." Despite its potential importance, there is little empirical evidence documenting that self-attribution matters to managerial decisions.

We explore managerial self-attribution bias in mergers and acquisitions by looking at the sequence of deals made by individual acquirers. We consider a number of factors, in addition to overconfidence, that may influence an acquirer's sequence of deals including agency conflicts, overvaluation, and the notion that firms may have or develop acquisition expertise. We construct tests designed to disentangle these alternative explanations. Specifically, if managers develop hubris through acquisition experience, the pattern of deals will exhibit three characteristics that

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[1] See Hietala, Kaplan and Robinson (2003) and Malmendier and Tate (2003) for direct evidence supporting the hubris hypothesis, and too many papers to list that document negative wealth effects to acquirers which is consistent with the hubris hypothesis (see Bruner (2002) for a review of these papers).

[2] See Baker, Ruback, and Wurgler (2004), Gilovich, Griffin and Kahneman (2002) and Kahneman and Tverskey (2000) for reviews of the literature.

can not be explained by any other single factor. First, compared to their first deals, acquirers will do worse, on average, in their subsequent acquisitions because of the developed overconfidence. Second, experienced acquirers who become overconfident will be more likely to acquire again, and the likelihood of future acquisitions will be increasing in the performance of their previous acquisition. Third, acquirers who become overconfident from successful acquisition experience will exhibit greater optimism regarding firm prospects and will exhibit such optimism in trading their companies' stocks. We find supporting evidence for all three conjectures. While alternative explanations may explain one or two of our findings, the only explanation consistent with all three is the self-attribution hypothesis.

We use a sample of acquisitions from 1985-2002. Over this period, U.S. public companies acquired $3.77 trillion worth of other U.S. public companies.[3] A large portion of this acquisition activity is concentrated in a relatively small number of acquirers. For the sample as a whole, we find 3,702 acquisitions of publicly traded target companies by 2,124 different acquirers, implying an average 1.74 deals per acquirer. However, the most active 5% of these acquirers average 7.58 deals each, representing 22% of 3,702 deals by number and 30% of the $3.77 trillion in deal value. We examine the history of these active acquirers to test the predictions of the self-attribution and other hypotheses.

We begin by examining acquirer abnormal returns at the announcement of an acquisition. We define *deal order* based on the number of mergers and acquisitions done by the acquirer in the preceding five years. We find a significant difference between the abnormal return to first deals (–0.10%) and that of subsequent deals (–1.50%). Moreover, this difference remains significant in a multivariate setting where we control for firm and deal characteristics.

We define acquirers as *frequent acquirers* if they acquire at least two public targets within a five-year period. We compare the first deals done by these frequent acquirers to first deals done by infrequent acquirers. Interestingly, both groups exhibit insignificant average

[3] Deal values adjusted to 2002 dollars using the CPI.

abnormal returns. Thus, the negative return associated with frequent acquirers is only found in deals following previous acquisition experience. The evidence is consistent with the notion that acquirers with no acquisition history show no evidence of hubris. Frequent acquirers exhibit negative wealth effects consistent with hubris, but only after they develop acquisition experience.

The second part of the empirical tests examines the acquirer's long-term stock performance following the acquisition. Overconfidence stemming from self-attribution bias predicts that value destructive deals follow successful deals, the source of the overconfidence.[4] We are interested to see whether success from previous deals leads to more acquisitions.

We examine ex-post acquisition performance using three-year buy-and-hold excess returns (BHERs). We stratify the sample by whether the acquirer goes on to acquire again to see if ex-post performance influences future acquisition activity. We find those that go on to acquire again (frequent acquirers) experience a mean BHER of 12.71% following first deals while those that cease acquiring exhibit a mean BHER of –12.27%. Both of these figures are statistically significant at the one percent level and highly economically significant. These results suggest that success following the first deal leads to an increased likelihood of more deals. However, these next deals are value destructive in that they are met with negative announcement reactions and followed by insignificant BHERs. We find a similar pattern when we examine which acquirers go on to third and fourth acquisitions.

We then test to see if performance following prior acquisitions motivates frequent acquirers to do more deals. We examine the likelihood a firm engages in an acquisition as a function of its previous year's stock return, to control for the well documented run-up prior to acquisitions, and the stock return interacted with an indicator variable of whether the firm has engaged in another acquisition in the past five years. If the returns following an acquisition contribute to managerial hubris, then we would expect to find a positive and significant coefficient on this interaction of stock return and previous acquisition activity. We indeed find a

[4] Alternatively, if managers develop acquisition expertise from experience we would expected the wealth effects of deal order to be the exact opposite, more positive subsequent deals relative to first deals.

positive coefficient on this interactive variable. Moreover, the coefficient is three times larger than that found on previous stock return alone. This finding supports the notion that hubris may stem from past "success" even though past "success" does not lead to success in future deals.

Finally, we examine insider trading by top mangers during the six months prior to the acquisition announcement. If frequent acquisitions are driven by overconfidence then we would expect to see managers accumulating more shares prior to the acquisition. We control for the normal insider trading activities with a cross-sectional benchmark as well as a time-series benchmark. Under both benchmarks, we find no evidence of abnormal purchasing or selling prior to first deals. However, we do find positive abnormal purchasing prior to higher order deals. The managerial insider trading activity suggests management is more optimistic about firm prospects heading into higher order deals than they were heading into first deals.

Although our results support the notion that managerial hubris developed over acquisition experience leads to more acquisitions, we also consider other hypotheses that might cause a company to become a frequent acquirer. First, some managers may possess acquisition skill. If this is the case, we would expect these acquisitions to exhibit more positive wealth effects. Instead, we find the first deals made by both frequent acquirers and infrequent acquirers do not destroy value while higher-order deals exhibit negative wealth effects. Second, managers that frequently acquire may be driven by self-interested agency motives. However, if frequent acquirers are motivated by agency issues, we would expect that manager's purchasing of stock prior to these acquisitions would be nonpositive. Instead, we find that the abnormal purchase of stock is insignificant prior to the first deals and significantly positive for higher order deals. Lastly, a company may frequently acquire if the stock is (frequently) overvalued. However, as in the case of agency, overvaluation suggests manager net purchases of stock would be negative (or at least nonpositive). Overall, the only hypothesis that explains the entirety of our results is the self-attribution bias hypothesis.

Our study has several contributions. First, it adds to the empirical literature of behavioral finance by documenting evidence that overconfidence in acquisitions is developed from past

acquisition experience. Second, it adds to the empirical literature of mergers and acquisitions by illustrating that the well-documented negative announcement effect associated with public acquisitions is concentrated in higher order deals. Last, we document evidence that the market learns from an acquirer's acquisition history. The market forms an expectation of an acquirer's future acquisition activity based on its acquisition history and impounds the expected wealth effect into the stock price.

The remainder of the paper proceeds as follows. Section 2 discusses the previous literature on frequent acquirers. Section 3 describes our data and methods. Section 4 presents results on announcement effects. Section 5 presents results on post-acquisition performance and its relation to the likelihood of future acquisitions. Section 6 presents results on insider trading prior to acquisitions. Conclusions are presented in section 7.

2. Prior research on frequent acquirers

Previous studies examine the wealth effects of acquirers who make many acquisitions; however, their purposes and methods differ from ours. Fuller, Netter, and Stegemoller (2002) examine the wealth effects of firms that make five or more acquisitions during any three-year period.[5] By choosing a sample of only frequent acquirers, they hope to minimize firm specific variation in their sample. They argue that by reducing firm specific variation in acquirer abnormal returns they can better isolate the impact of target and bid characteristics on the returns to acquirers.

In their cross-sectional tests they include a dummy variable indicating whether the deal is the acquirers' first deal and another dummy variable indicating the deal is a fifth or higher deal. They find little or no evidence that the acquirer's abnormal return varies with the order of the deal. One possibility is that differences in the wealth effects by deal order exist, but these

[5] Fuller, Netter, and Stegemoller (2002) include acquisitions of public, private, and subsidiary targets in their sample. They report results for the subsample of public targets. Above, we refer to these results, given they are most relevant to our purpose.

differences may be evident between relatively low deal orders. The market may learn to anticipate further acquisitions after a few deals and therefore the negative wealth effect associated with high order deals will not be shown in the announcement effect.

Another related branch of work consists of studies documenting the wealth effects of firms involved in acquisition programs. These firms announce their intention to acquire multiple firms over coming months or years. Schipper and Thompson (1983b) document that conglomerate acquirers earn positive wealth effects upon the announcement of the acquisition programs. These acquirers "carried out aggressive acquisition programs during the late 1950s and 1960s." In another paper, Schipper and Thompson (1983a) document that firms with an active acquisition history react negatively to regulatory changes that make acquisitions more difficult. They interpret this as evidence that acquisitions create value for acquirers. Bhabra, Bhabra, and Boyle (2001) also examine the wealth effects of acquisition programs using a more recent sample of 65 announcements made between 1977 and 1992. They too document significantly positive wealth effects. One way to reconcile these results with ours is that acquisitions of private targets are often value creating. If the market expects a firm to acquire mostly private targets, it may respond positively to the announcement of an acquisition program. However, even for private acquisitions, we find that higher order deals exhibit significantly lower wealth effects than the first deals (see appendix for details).

3. Data and methods

The sample of acquisitions is obtained from Securities Data Company's (SDC) U.S. Mergers and Acquisitions Database. We select domestic mergers and acquisitions that were announced between 1980 and 2002. We then match the SDC data on deal characteristics with return and market capitalization data from the CRSP database, and with accounting data from Compustat. A deal is included if it satisfies the following criteria:

1) Both the acquirer and the target are publicly-traded U.S. companies.
2) The acquirer is covered by the CRSP database.

3) The deal is indicated by SDC either as a merger or acquisition of majority interest (SDC form code equal to "M" or "AM").
4) The deal value is no less than 1 million dollars.
5) The deal value is at least 1% of the acquirer's market value of equity, the latter measured two trading days before the announcement.
6) The deal is completed and the time between completion date and announcement date is no more than 1,000 days.

Imposing these requirements results in a sample of 4,051 mergers and acquisitions during the period 1980-2002.[6]

We limit the sample to publicly traded targets for the following reason. Numerous studies document negative wealth effects for acquirers of public targets, consistent with the hubris hypothesis. In contrast, acquirers of private targets exhibit positive wealth effects. Thus, it does not appear that hubris plays a key role in explaining acquisitions of private targets, on average. One possible reason for this difference is competition. Greater competition for public targets will decrease the gains to the winning bidder and could exacerbate the effects of overconfidence, leading to the winner's curse in these deals. Given our focus on whether self-attribution drives overconfidence, we focus on public targets where previous studies document evidence consistent with overconfidence.[7]

We next create a measure to distinguish frequent from infrequent acquirers. We define a frequent acquirer as follows: a firm is defined as a frequent acquirer if it announces at least two public deals within any five-year period. Correspondingly, we count the deal order based on the same company's acquisitions in the previous five years. For example, over our sample period, American Airlines Inc. acquired 6 public companies. We define the deal order of its acquisitions as follows:

[6] In general, we use the sample selection criteria of Moeller, Schlingemann, and Stulz (2004).
[7] In contrast to this point of view, it is reasonable to argue that acquisitions of private targets play an important role in the development of acquisition expertise and/or hubris. We also conduct all of our tests using both public and private target firms and report the results in the Appendix. These tests show our results and conclusion do not depend on this sample criterion.

Deal announcement date	*Deal order*	*Frequent acquirer*
November 17, 1986	1	Yes
April 18, 1988	2	Yes
June 20, 1988	3	Yes
November 19, 1998	**1**	Yes
October 4, 1999	2	Yes
January10, 2001	3	Yes

Notice that American Airline's1998 deal has a deal order of 1 since there is no acquisition in the preceding five years. We define a frequent acquirer and its deal order based on a rolling 5-year window. While the choice of five years is somewhat arbitrary, we chose it to get a sufficient time span to allow an acquisition history to develop, but wanted it short enough that past acquisitions were likely to be informative. In other words, the fact that a company has five acquisitions in five years may be very different from a company that has five acquisitions over 20 years. That said, when we define a frequent acquirer and its deal order based on the whole sample period, our main results are robust. Because of the rolling-window definition of frequent acquirers and deal orders we need to use the first 5-years of our sample to create a history. Thus, our final sample starts from 1985 and includes 3,702 deals.

We define deal order based on the firm's acquisition history rather than on a particular CEO's acquisition history. Our choice is based on the following reasons. First, the CEO may not be the only relevant manager in making acquisition decisions or that is influenced by the acquisition experience. Multiple managers influence firm decisions including senior executives as wells as the board of directors, who often must approve major acquisitions. Moreover, CEO decisions are constrained by corporate governance mechanisms such as corporate by-laws and monitoring by the board and major shareholders. In this sense, corporate culture as it relates to acquisitions may carry over from one particular CEO to the next. For example, if a CEO is replaced by another manager within the company, the firm's past acquisition experience may

influence the behavior of the new CEO.[8] Second, even if the CEO definition is correct, the resulting bias from using a firm-based definition will work against finding differences between past and future acquisitions. Consider two possibilities. If firm deal order simply measures CEO deal order with error, then we would expect the relationship between first and subsequent deals to be blurred. In other words, we would underestimate the difference simply due to noise. Alternatively, if CEOs are replaced in a systematic way such that better CEOs replace poor performing CEO, then we would expect the new CEO to engage in less value destructive deals. If this tends to happen after firms' first deals then we would expect to find firms' second deals, which are the work of the new CEO, to be less value destructive. In general, if our definition mistakenly labels as higher order deals those deals done by new CEOs that, properly labeled, would be first deals, then we would be less likely to find a difference. Lastly, the use of a 5-year rolling window should help reduce the impact of CEO turnover on our results. Taken as a whole, it is not clear that using the CEO definition is more appropriate or that it would add much insight. Given the cost of getting complete information on the CEOs for our sample firms, which would involve not just tracking the CEOs for our firms, but also tracking individual CEO's prior career history and acquisition experience, we believe it makes sense to use firm-based deal order.

Table 1 reports the sample frequency and the value of deals stratified by deal order. We have 2,234 first deals in our sample worth over $1.5 trillion. Panel B illustrates that 1,585 deals are completed by 1,493 firms that never complete more than one deal in any five year period over our sample period. In contrast 695 firms engage in at least two deals within a five year period, accounting for 2,117 of the 3,702 deals in our sample.

We first investigate acquirers' wealth effects by examining abnormal stock returns around the announcement date. We estimate these abnormal returns over a 3-day window (−1, +1) using the market model benchmark. Parameters for the market model are estimated over the

[8] For example, when GE replaced Jack Welch in 2001 with GE insider Jeffrey Immelt, it was no surprise that acquisitions continued to be an integral part of the company's growth strategy (see "How Does GE grow?" *BusinessWeek*, April 8, 2002, p. 28).

230 trading day interval (−250, −21) by regressing the firm stock return against the CRSP equally-weighted market index returns.

4. Announcement returns

Panel A of Table 2 reports acquirer abnormal returns by deal order.[9] Self-attribution bias suggests that overconfidence plays a larger role for higher order deals. The prediction is that higher order deals will exhibit more negative wealth effects than first deals. For first deals, we find the mean acquirer abnormal return over the three-day window surrounding the announcement date is –0.10%, insignificantly different from zero. This finding contrasts with recent studies that document negative abnormal returns to acquirers of public companies over a similar time period (see Fuller, Netter and Stegemoller (2002) and Moeller, Schlingemann, and Stulz (2005)). However, examination of deals that follow at least one previous deal in the last five years exhibit negative announcement returns. Acquisitions with a deal order of 2, 3, 4, 5, 6, and 7 all have at least 37 observations and have abnormal returns of –1.54%, –1.37%, –1.66%, –1.21%, –1.74%, and –1.96%. Moreover, all of these figures are significantly different from zero at the one percent level. Combining all deals with a deal order of two or more results in a mean abnormal return of –1.50% with a cross-sectional t-statistic of –9.43. These results suggest that the value loss associated with acquisitions of public companies is concentrated in higher-order deals by frequent acquirers.

Self-attribution also predicts this difference in first and higher order deals to exist within the sample of frequent acquirers. This difference could be entirely due to differences between frequent and infrequent acquirers. Panel B of Table 2 explores whether the announcement effects of first deals differ between frequent acquirers and infrequent acquirers. While stratifying the sample this way involves a look-ahead bias to determine if the firm engages in later acquisitions, it allows us to see if the negative announcement effect is driven by systematically different firms.

[9] The sample size in Table 1 and Table 2 differ due to the data requirements for calculating abnormal returns.

We find 1,566 of the 2,206 first deals are made by infrequent acquirers. The average abnormal return for this group is –0.01%, statistically indistinguishable from zero. For frequent acquirers, we find first deal abnormal returns average –0.31%, also statistically insignificant. The difference between the first deal abnormal returns for frequent and infrequent acquirers is also insignificant. The difference between frequent acquirer abnormal returns to first versus higher order deals is significant at the one percent level. Thus, it appears that the negative abnormal return to frequent acquirers is only found in higher-order deals, where previous acquisition experience may lead to the development of hubris.

Another possible explanation for the different wealth effects could be differences in the propensity to use cash or stock as the method of payment. Numerous studies argue that all cash offers are associated with acquirers unlikely to be overvalued and all equity offers are associated with acquirers most likely to be overvalued. Consistent with this notion, Asquith, Bruner, and Mullins (1987) document cash offers are associated with less negative acquirer announcement returns, and all equity offers are associated with more negative announcement returns. Fuller, Netter, and Stegemoller (2002) show that the acquirers stock price reaction depends on whether the method of payment is stock, cash or a mixture of the two. They report acquirers of public targets earn significantly negative abnormal returns when the method of payment is stock, and insignificant returns when all cash or a mixture of cash and stock is used. For our purposes, if frequent acquirers tend to use stock more often in higher-order deals then this would provide an alternative explanation to self-attribution bias.

Panel C of Table 2 reports the announcement returns for both first deals and higher-order deals stratified by the method of payment. For first deals, we find cash acquisitions result in significantly positive acquirer wealth effects. The average acquirer abnormal return for this subsample of deals is 1.23%. In contrast, when stock is used in first deals the average acquirer abnormal return is –1.20%, significant at the one percent level. First deals with a mixture of cash and stock as the method of payment result in an insignificant mean abnormal return of 0.25%. For higher-order deals we find that the average abnormal return is an insignificant –0.05% for

cash deals. For stock deals and for mixture deals we find average abnormal returns of –2.10% and –1.40%, both significant at the one percent level. Thus, for both first deals and for higher-order deals we find a pattern similar to previous studies: cash deals result in the most positive reaction, stock deals the most negative, and deals involving a mix of cash and stock fall in between.

Most important for our purposes, however, is whether the reactions to first and higher-order deals differ when grouped by method of payment. In particular, if the differential reaction exists only for stock acquisitions, then frequent acquirers may simply be more overvalued than infrequent acquirers. We can rule this out, however, if we find the difference in wealth effects exists for cash acquisitions, where overvaluation is unlikely to be a motive for acquiring. We find that higher-order deals exhibit significantly more negative acquirer abnormal returns in all three methods of payment classifications. The difference between the reaction for first deals and higher-order deals is 1.28%, 1.65% and 0.90% for cash, mixture and stock deals, respectively. All three of these differences are significant at the ten percent level. These results suggest the difference in the wealth effects of first and higher-order deals is not driven by differences in the method of payment and suggests overvaluation of the acquirer does not appear to be the driver behind our findings.

We conduct a number of other robustness checks. We repeat the analysis using market-adjusted returns rather than using the market-model adjusted returns. We also examine the announcement returns over the eleven-day window (–5, 5) around the announcement date. In both cases we find the differences between the sub-samples both economically as well as statistically significant.

We also re-define deal order based over the entire period 1980-2002, rather than on previous five years. Under this definition, our sample includes 4,051 public deals. Among them, high order deals (deal order larger than 1) account for 44% of the number of deals and 68% of the total deal value. For first deals, we find a mean abnormal return of 0.05% over the three-day window surrounding the announcement date, insignificant at 10% level. Among first deals, both

frequent acquirers and infrequent acquirers have insignificant mean abnormal returns. For high order deals, the mean abnormal return is –1.5%, significant at 1% level.

The financial sector went through enormous consolidation during our sample period resulting in a large number of frequent acquirers. To see whether this industry effect drives our results we eliminated all financial firms from the sample and reexamined the wealth effects. This reduces the sample by 1,463 deals, 777 of which are high order deals. For first deals, the mean abnormal return is 0.05% over the three-day window surrounding the announcement date, not significantly different from zero. For high order deals, the mean abnormal return is –1.9%, significant at the 1% level. Thus, our results are not driven solely by consolidation in the financial industry.

To see whether our results apply to a broad spectrum of deals, we include acquisitions of 3,883 private targets and 934 subsidiaries of public firms during the period of 1985-2000. For first deals of the enlarged sample, the mean abnormal return is 1.92% over the three-day window surrounding the announcement date, significant at 1% level. For high order deals, the mean abnormal return is 0.10%, insignificant at 10% level. The difference is significant at 1% level. This relationship between first and higher order deals is also found within the sample of private deals (See appendix for details). Overall, we interpret this as suggesting the difference between first and higher order deals is quite robust.

4.1. Acquirer and deal characteristics

There may be other characteristics that systematically differ between first and higher-order deals that could potentially explain the differential reaction. To check, we examine firm and deal characteristics for the two groups of acquisitions. Table 3 reports descriptive statistics for acquirers and deals stratified by first deals versus second and greater deals (higher-order deals). We find that acquirers involved in higher-order deals are larger. The higher-order deal acquirers have a mean (median) asset value that is 3.7 (7.4) times that for first deal acquirers. Similarly, we find the investment opportunities of first deal acquirers, as proxied by the firm's

Tobin's *q* ratio, are much better than the investment opportunities of acquirers involved in higher-order deals.

Table 3 also reports deal characteristics. We see the relative size of the target to the acquirer is much larger for first deals. First deals are also more often conglomerate deals (measured by whether the 2-digit SIC code of the target differs from that of the acquirer). These two results are somewhat surprising given that relatively large deals and conglomerate deals have both been shown to exhibit more negative announcement effects (see, for example, Moeller, Schlingemann, and Stulz (2004)). We also see in Table 3 that first deals are more often done via a tender offer, are more often made as all cash offers, and are less often made as all equity offers. We later control for these differences in characteristics in multivariate regressions to see whether they can account for the more negative announcement effects of higher-order deals.

4.2. Probability of acquiring and previous acquisition activity

Given the propensity to acquire exhibited by many of the frequent acquirers, one question is whether higher order deals come as much of a surprise. If the market better anticipates higher-order deals and incorporates some of the anticipated wealth effect, then the reaction at announcement may be muted. We conduct a logit analysis to explore the impact of previous acquisition activity on the likelihood a firm engages in an acquisition. We take all firms with data from Compustat and CRSP and construct a panel dataset from 1985-2002. The dependent variable in the logit analysis takes the value of one if SDC reports the firm acquirers a publicly traded target firm in a given calendar year and equals zero otherwise. Our final dataset consists of 99,807 firm-year observations.

The results are reported in Table 4. We include economy-wide, industry-wide and firm specific characteristics as right hand side variables. We see that large firms, firms with high ratios of free cash flow to assets, high Tobin's *q* ratios, and high levels of liquid assets are more likely to acquire. A firm's leverage is negatively related to acquisition likelihood. We also see

that acquisitions are more likely to occur when the stock market as a whole has performed well and when the firm's stock performance has been strong.

Our main interest is whether previous acquisition activity explains future activity. Given the well documented tendency for mergers to cluster in time and industry (see Mitchell and Mulherin (1996), Gugler, Mueller and Yurtoglu (2004), and Rhodes-Kropf and Viswanathan (2004)), we include controls for economy-wide and industry-wide acquisition activity, measured as the natural log of one plus the number of deals in the previous year in the economy and industry. Finally, to see if a firm's past acquisition activity affects its likelihood of engaging in additional acquisitions, we include the natural log of one plus the number of acquisitions the firm has done in the previous five years. The coefficient on this variable is positive and significant at the one percent level. In fact, it is the most statistically significant variable in the logit analysis. The importance of past acquisition activity in predicting future acquisitions indicates that higher-order deals should be less of a surprise to the market than first deals, implying the measured announcement effects of higher-order deals may be somewhat muted. This suggests the difference between the total wealth effects of first and higher-order deals may be understated by announcement abnormal returns. Thus, we explore the effect of anticipation on the wealth effects below.

4.3. Multivariate regressions of announcement returns

We conduct cross-sectional regressions of the acquirer abnormal returns to see if differences in acquirer and deal characteristics explain the more negative abnormal return found in higher-order deals. We include a dummy variable equal to one if the deal is preceded by one or more deals in the previous five years. The first column of Table 5 reports the results. We find firm size, Tobin's q, and operating cash flow are all negatively related to the acquirer's abnormal return. We find the abnormal return increases in the relative size of the deal. Moreover we find the acquirer's abnormal return is larger if the form of acquisition is a tender offer, the method of payment is all cash, and if the acquirer is in the financial industry. We find acquirer abnormal

returns are lower when the method of payment is all equity. Our dummy variable indicating a second or later deal (DealOrder≥2) carries a coefficient of –0.0069 and is statistically significant at the five percent level. This suggests that after controlling for deal and acquirer characteristics higher-order deals are met with an abnormal return that is 0.69% less than first deal reactions. However, we have yet to control for the fact that higher-order deals are more highly anticipated.

Specification 2 in Table 5 controls for this differential anticipation by including the fitted value from the logit in Table 4 as a control variable. We find a positive coefficient, significant at the one percent level, on the probability the firm will be an acquirer. This suggests that differential anticipation indeed affects the market's reaction at the announcement. In particular, it indicates that the more anticipated a deal, the less negative the announcement effect. In this specification the coefficient on the indicator variable of a higher order deal (DealOrder≥2) is –0.0099, significant at the one percent level. Thus, after controlling for both acquirer and deal characteristics as well as for anticipation we find higher-order deals experience more negative abnormal returns. Moreover, the economic magnitude of this difference, –1%, is large. To complete the examination of acquirers' wealth effects and to examine the relation between stock performance associated with previous deals and the likelihood of future acquisitions, we next examine post-acquisition stock price performance.

5. Post-acquisition stock price performance

We measure acquirers' post acquisition stock performance by computing buy-and-hold excess returns (BHERs) over the three-year window following the completion of the acquisition. The BHER is calculated as the acquirer's cumulative three-year return minus the cumulative three-year return on a size and book-to-market matching portfolio. If the sample firm is delisted within the three-year window the calculation ends at the delisting date.

To construct the size and book-to-market benchmark portfolios we follow the methodology Lyon, Barber and Tsai (1999). Specifically, we take all firms identified by CRSP and rank them into 10 deciles based on market value of equity two days before the completion

date. We calculate a firm's book-to-market ratio by dividing the firm's book value of equity (Compustat data item #60) measured the fiscal year end prior to the completion date by the market value of equity measured two days prior to the completion date. Firms are next sorted into five quintiles based on the book-to-market ratio. The result is a 10x5 matrix of size and book-to-market benchmark portfolios. We then use all the firms that are in the same size deciles and book-to-market quintile as the sample firm for the matching portfolio.

Following Lyon, Barber and Tsai (1999), we make statistical inferences based on skewness-adjusted t-statistics, which for the mean BHER is calculated as

$$t_{sa} = n^{0.5}\left(S + \gamma S^2/3 + \gamma/(6n)\right)$$

where n is the sample size, S is the ratio of sample average to the standard deviation, and γ is the sample skewness.

We present the results on the post acquisition stock performance in Table 6. Panel A presents mean BHERs by deal order. We find the mean three-year buy-and-hold excess return (BHER) to first deals by both frequent and infrequent acquirers is –4.80%, significantly different from zero at the ten percent level. None of the mean BHERs associated with deal order values of 2 to 7 (deal orders where we have at least 30 observations) are significant and, as a whole, the mean BHER for higher-order deals (deal order>1) is a statistically insignificant 2.39%. While there is weak evidence that first deals are followed by poor stock performance on average, overall the insignificant long-term returns suggest that the announcement effects capture the wealth effects of the acquisitions.[10]

Loughran and Vijh (1997) find significantly negative average long-term returns following acquisitions where the method of payment is stock. They find positive long-term returns following cash deals. We report the BHERs to first and higher-order deals broken out by method

[10] In a slightly different sample over 1985-1997, the mean BHER following first deals is insignificantly different from zero. See Table 7.

of payment in panel B of Table 6. We find that the only significant BHER is for the higher-order deals where cash is the method of payment. Interestingly, the BHERS are larger for the higher-order deals in all three methods of payment categories. While weak, this evidence favors the managerial skill hypothesis in that higher-order deals are associated with more positive long-term wealth effects, at least for all cash deals. However, given the general lack of statistical significance we hesitate to draw strong conclusions from these results.

The evidence presented so far are consistent with self-attribution bias leading to overconfidence in that first deals (by both frequent and infrequent acquirers) are not value destructive while high-order deals exhibit negative wealth effects (i.e., they have negative announcement returns and insignificant post-acquisition abnormal returns). Moreover, Self-attribution bias also predicts that successful deals are followed by more deals. Even if success, measured by post-acquisition stock performance, is due to chance, managers will tend to credit their own ability and therefore become overconfident and engage in more deals. We look more closely into the sequence of deals and the relationship between past deal performance and future deal activity.

Panel C of Table 6 examines the BHERs following first deals stratified by whether the acquirer goes on to become a frequent acquirer. If self-attribution is present, we should see BHERs following the first deal differ by whether the firm goes on to acquire again. The mean BHER associated with first deals by the frequent acquirer group is 12.71%, statistically significant at the one percent level. In contrast, the first deal mean BHER for the infrequent group is −12.27%, also significant at the one percent level. These results are consistent with the notion that success following first deals is likely to lead to future deals. However, these future deals on average do not exhibit significant BHERs and are met with a negative reaction at announcement. These results indicate frequent acquirers may suffer from managerial hubris induced by self-attribution bias. We explore this dimension further below.

5.1. Ex-post acquisition experience and the likelihood of future deals

To test whether good post-acquisition stock performance leads firms to acquire more, we examine the BHERs following first, second, third and fourth deals, broken out by whether or not the acquirer engages in another acquisition within the next five years. For these results we limit the sample through 1997 so we have five years of post-acquisition data. We report the results in panel A of Table 7. For this sample limited through 1997, we find results similar to those in Panel C of Table 6. The average BHER following first deals for those that acquire again is 18.94% while those that do not acquire again earn an average BHER of –15.04%. Both these figures are significant at the one percent level. We see a similar pattern when we look at BHERs following second deals by whether they do a third deal. Those acquirers that acquire again, do so after a relatively good experience. This pattern holds for third and fourth deals. These results suggest subsequent deals follow good performance, but this good performance does not carry over (since the subsequent deal on average is met with negative announcement effects and insignificant post-acquisition BHERs).[11]

Panel B takes a slightly different approach to examining the performance of ex-post successful acquirers. In the third column we report the percentage of acquirers with positive BHERs by deal order. We see that the percentage of acquirer's with positive BHERs following first deals is 39.79%, significantly less than 50% at the one percent level. The proportion of deals with positive BHERs for deal orders 2 through 15 never differs from 50% at conventional levels of significance. Thus, while first deals seem to exhibit some evidence of poor performance, overall the evidence is consistent with the notion that the post-acquisition performance is due to chance and has an equal probability of being good or bad.

The fourth column reports the proportion of acquirers that go on to acquire again. We see 31.72% acquire again within five years of their first deal. This proportion climbs to over 81% by

[11] The construction of BHERs results in a potential overlap of BHERs from one deal to the next. Given subsequent deals follow positive BHERs, we would expect overlap to result in more positive BHERs for subsequent deals. Even with this construction bias we find subsequent deals exhibit insignificant BHERs.

the deal order 6 (the last deal order whose sample size is at least 30) and is significantly higher than 50% for deal orders greater than 3. This is consistent with the notion that managers over weight past positive acquisition experience and under weight poor experience. Such self-attribution bias would lead to a higher rate of recidivism even though the rate of success (as measured by the proportion of positive BHERs) does not similarly rise.

Another way to examine whether past acquisition experience is influencing managers to make additional acquisitions is to conduct a logit analysis. The positive coefficient found on the Firm Return variable (which measures the firm's stock return in the previous year) in Table 4 is consistent with the hubris hypothesis; however, it is also consistent with the overvaluation hypothesis. To help distinguish these two interpretations, we estimate the logit regression reported in Table 4 with an additional explanatory variable: the interaction of the firm's stock return in the previous year and a dummy variable indicating an acquisition occurred in the previous five years, (Firm Return)x(PastDeal). A positive coefficient on this variable would indicate that after controlling for past returns, a firm is more likely to engage in an acquisition when they experience positive performance following a previous acquisition. The positive coefficient also suggests negative performance following an acquisition acts as a deterrent to future acquisitions. The results are reported in Table 8. While the results are similar to those in Table 4, our main variable of interest, (Firm Return)x(PastDeal), has a positive and significant coefficient. Moreover, the coefficient on this interactive variable is three times larger than the coefficient on Firm Return. This indicates past stock performance that follows an acquisition is much more influential on a firm's decision to acquire than past performance in general. Taken together, the results on the relationship between past ex-post acquisition performance and future acquisition activity supports the hubris hypothesis.

6. Insider Trading Activity

So far our evidence is consistent with managers developing overconfidence. We now examine their trading activity to see whether managers exhibit more optimistic trading behavior

prior to higher order deals. If managers truly believe these acquisitions will create value then they would want to increase their stake in the firm. On the other hand, if agency or overvaluation is driving the results we would expect to see managers decreasing their ownership.

We examine the trading activity of top managers using insider trading data from Thomson Financial. Thomson Financial data starts from January 1986 and contains all transactions by insiders subject to disclosure according to Section 16(a) of the Securities and Exchange Act of 1934. Following Seyhun (1990a), we define top managers as follows: CEOs, CFOs, COOs, presidents, chairmen of the board, persons who are both officers and directors, controlling persons, and general partners. Following Lakonishok and Lee (2001), we examine three types of trading. "Purchases" and "Sales" refer to open market or private purchases and sales, respectively. "Option Exercises" refers to the acquisition of shares through the exercise of options. The reported "sales" numbers include both sales of shares owned as well as sales of shares acquired from exercising options that are immediately sold. We calculate "Net Purchases" as the number of shares acquired through open market or private purchases, and through option exercises, minus the number of shares sold.[12] We then standardize this measure by total insider transactions (the number of shares purchased plus number of shares acquired through option exercises, plus the number of shares sold). As argued by Seyhun (1990b), this ratio is not sensitive to changes in the number of firms or trading activity over time. Moreover, the ratio does not display heteroscedasticity or extreme outliers. We call this the Net Purchase Ratio (NPR) and focus on it to measure top managers' trading activities.

Out of our acquisition sample, we find 1,890 acquiring firms in Thomson Financial data. Since the insider trading data starts from 1986, we restrict our study to acquisitions that are

[12] It is important to include option exercises as part of the net purchase measure. Ofek and Yermack (2000) find that the typical manager sells virtually all shares acquired through option exercise. Therefore shares sold is closely related to the number of shares acquired through option exercise. Without controlling for option exercise, an increase in selling activity may simply reflect managers' hedging incentives rather than their opinions on future stock performance. Moreover, if a manager does not sell shares acquired through option exercise, it can suggest managerial optimism. When a manager is confident about future stock performance, she has the incentive to exercise options before expiration and hold on to those shares because further price appreciation will be treated as capital gains rather than ordinary income.

announced after 1986. That leaves us with 3,276 acquisitions. We measure insider trading activity during the 6 months (180 days) before the announcement of an acquisition.[13] In addition to calculating the unadjusted NPR, we construct two separate benchmarks to control for normal insider trading activity in the absence of acquisitions.

The first benchmark, a cross-sectional control, is the mean NPR for a size-matched portfolio of firms during the 180 days before an acquisition announcement. For the cross-sectional control sample, all non acquiring firms in the Thomson Financial insider trading dataset are considered. A firm does not need to have insider trading activity during the sample period to be included. For each acquisition event, we sort all control-firm candidates plus the acquiring firm based on their market values of equity one year prior to the acquisition announcement. We then take as the matching portfolio all firms in the same size decile as the acquiring firm. The cross-sectional adjusted NPR is calculated as the acquiring firm's NPR minus the average NPR for the matching portfolio during the 180s days before the acquisition announcement.

The second benchmark, a time-series control, is the acquiring firm's NPR measured from days [-360, -180) before the announcement of the firm's first deal in the preceding five years. The time-series adjusted NPR for each acquisition event is calculated as the acquiring firm's NPR during the 180 days before the current deal's announcement, minus its NPR during days [-360, -180) before the announcement of the firm's first deal within the last 5 years.

We report the results in Table 9. The first column reports the unadjusted NPR. We see top managers exhibit a positive and statistically significant NPR of 0.063 prior to first deals. Interestingly the NPR more than doubles for second deals to 0.131, and continues to increase through deal order eight. All deals with deal order greater than one have an average NPR of 0.171 which is significantly different from zero at the one percent level *and* significantly different from the mean of first deals at the one percent level.

[13] We include all insider transactions where Thomson Financial either verifies the transaction or has a high degree of confidence in the trade (i.e. Thomson Financial data item cleanse = 'R' or cleanse='H').

The second column of results reports the mean cross-sectional adjusted NPRs. We see first deals have a mean adjusted NPR of 0.016, statistically indistinguishable from zero, while higher order deals have a mean adjusted NPR of 0.127. The adjusted NPR for higher order deals is both significantly different from zero and significantly different from the mean for first order deals at the one percent level.

Finally, the third column presents the time-series adjusted NPR results. For first deals we see the time-series adjusted NPR is –0.011, not statistically different from the time-series benchmark. In other words, first deals are not preceded by any abnormal insider trading when benchmarked against the firm's pre-acquisition NPR. For second and greater deals we find an average NPR of 0.054, significant at the one percent level. The difference between the mean NPR for first deals and higher order deals is also significant at the one percent level. Taken as a whole, these results support the notion that managers are more confident going into higher order deals than going into first deals. This is consistent with managers' developing overconfidence in their acquisition expertise.

7. Conclusions

We explore the role of acquirers' acquisition history in mergers and acquisitions. Our results suggest that self-attribution of past success leads to hubris in future decision making. Investigation of the announcement effects reveals that acquisitions by frequent acquirers are value-destructive. However this negative effect is isolated in high order deals. When we compare the first deals done by the frequent acquirers (who go on to acquire more deals within five years) to first deals done by infrequent acquirers, we see both groups exhibit insignificant abnormal returns. This is consistent with the notion that hubris developed from past acquisitions leads to value-destructive deals.

We also find that these value-destructive high-order deals are motivated by previous acquisition experience. Acquirers who acquire another company within five years of a previous acquisition exhibit positive long-run performance subsequent to their first deals. In contrast,

acquirers who stop after their first deals on average have negative long-run performance. The same pattern holds subsequent to second, third and fourth acquisitions. A logit regression also suggests that the likelihood of making another acquisition increases with positive experience in past acquisitions. Yet these additional acquisitions are met with significantly negative announcement returns and insignificant long-run returns, suggesting they are value destructive.

We also find evidence that the market forms expectations of future deals based on an acquirer's acquisition history and these expectations are impounded into stock prices. We examine the likelihood a firm will engage in a public acquisition in a given year using a logit regression. The most statistically significant variable is the acquirer's prior acquisition activity. We then include the predicted probability from the logit analysis as a control variable in the multivariate regression of announcement effect. We find a positive coefficient on the probability of an acquisition suggesting that the anticipation dampens the market reaction when a deal is announced. Nevertheless, higher order deals continue to exhibit abnormal returns that ae significantly more negative than those of first deals.

Finally, we examine the trading behavior of top managers leading up to the acquisition announcement. We find top managers' net purchase of stock is greater preceding higher order deals than it is for first deals. This suggests managers are more confident about firm prospects heading into higher order deals, even though these higher order deals are met with significantly negative wealth effects. Taken as a whole, we interpret our evidence as consistent with overconfidence stemming from self-attribution bias.

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APPENDIX

Results for a Sample of Public and Private Targets

In the body of the paper we restrict our sample to deals involving publicly traded targets. We now explore the sample of deals involving private, subsidiary, and public target firms. As a whole our results are markedly similar. We briefly discuss the results for this broader sample and present announcement effects in Table A1. A complete set of results is available from the authors upon request.

Table A1 reports the announcement effects by deal order for this larger sample as well as broken out for public and private target deals. We see higher order deals are met with significantly lower announcement returns than first deals, and this 1.82% difference is both economically as wells as statistically significant. The first deal abnormal returns for frequent acquirers and infrequent acquirers are statistically indistinguishable. Again the difference is with higher order deals and not characteristics of frequent acquirers.

We further break out the sample by whether the deal involves a public or private target. However, acquisition experience in one type of deal (say, private) may effect the next acquisition even if it is of a different type (say, public). So, we keep the deal order based on the broad sample. We find for both public and private deals, first deals exhibit significantly more positive announcement effect than higher order deals. The public sample results are very similar to those in the main body of the paper. It is well documented that private deals elicit positive stock price reactions for the acquirer. Interestingly, we find very large positive reactions to first deals, 2.78% on average. The reaction to higher order deals is a positive and significant 1.57%. Interestingly the difference between first and higher order deals is 1.22%, significant at the one percent level. We see in panel B that first deals announcement returns for frequent acquirers are not statistically different from infrequent acquirers for the pooled, public, and private samples.

Panel C of Table A1 partitions the sample by the method of payment. We find the difference between first and higher order deal mean abnormal returns is significantly positive for mixed deals and stock deals. The difference for cash deals is also positive but not statistically

significant. Further breakouts by target status and method of payment show similar results for public deals and private deals.

While not reported, we re-run all of our tests using this broad sample. We summarize the remainder of results below:

1) *Logit results*: We find acquisitions are much more likely for firms with past acquisition experience. We also find results similar to those reported in Table 8: we find that stock returns following a past acquisition are an important determinant of future acquisition likelihood.
2) *Cross-sectional regressions of the acquirer announcement effect*: We include a dummy variable for public targets. We find the coefficient on this dummy is negative and significant in both specifications. Most importantly for our purposes, however, is that the coefficient on the indicator variable of a higher order deal is negative and significant at the five percent level in both specifications (with and without the probability of an acquisition as an explanatory variable).
3) *BHERs*: We find firms that go onto acquire again within five years experience positive BHERs following their first deal while those that do not acquire again experience negative BHERs. A similar pattern follows the 2nd, 3rd and 4th deals. Namely, those firms that continue to acquire experience positive BHERs and those that stop acquiring experience significantly negative BHERs.
4) *Top management insider trading*: Top managements' net purchase of stock prior to acquisitions show that higher order deals are associated with greater net purchases of stock by insiders than first deals. We interpret this as evidence that mangers are more confident about the prospects of these higher order deals.

Table 1
M&A Activity among Frequent and Infrequent Acquirers

The sample consists of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. A frequent acquirer is defined as a firm that has two or more deals within a five-year period. Value of Deals is the aggregate deal values measured in 2002 millions of dollars.

Panel A: Acquirer's Deal Order

Deal Order	Number of Deals	Value of Deals ($ millions)
1	2,234	1,576,534
2	723	1,034,127
3	300	429,937
4	161	292,848
5	101	121,640
6	57	171,975
7	37	36,017
8	23	27,103
9	17	19,352
10	10	11,643
11	7	7,742
12	7	5,098
13	7	3,528
14	6	5,502
15	5	22,274
16	3	1,830
17	2	445
18	1	465
19	1	371

Panel B Frequent vs. Infrequent Acquirers

	Number of Acquirers	Percent of Acquirers	Number of Deals	Percent of Deals	Value of Deals ($ millions)	Percent of Deal Value
Infrequent Acquirers	1,493	68.24%	1,585	42.81%	1,032,590	27.40%
Frequent Acquirers	695	31.76%	2,117	57.19%	2,735,841	72.60%
Total	2,188		3,702		3,768,431	

Table 2
Acquirer Abnormal Returns among Frequent and Infrequent Acquirers

Sample consists of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. A frequent acquirer is defined as a firm that has two or more deals within a five-year period. CAR is the cumulative abnormal return measured over the event window (-1,1) where day 0 is the announcement date. The abnormal return is calculated based on market model parameters estimated over days –250 to –21. t-statistics are calculated based on the cross-sectional standard deviation of the CARs.

Panel A: Acquirer's Deal Order

Deal Order	Number of deals	CAR(-1,1)	t-stat
1	2,206	-0.0010	-0.41
2	720	-0.0154	-5.93 ***
3	299	-0.0137	-3.97 ***
4	160	-0.0166	-4.53 ***
5	101	-0.0121	-2.67 ***
6	57	-0.0174	-3.12 ***
7	37	-0.0196	-3.95 ***
8	23	-0.0084	-0.90
9	17	-0.0183	-1.78 *
10	10	-0.0104	-0.71
11	7	0.0081	0.53
12	7	-0.0214	-1.20
13	7	-0.0186	-1.37
14	6	-0.0085	-0.97
15	5	-0.0201	-2.00
16	3	-0.0288	-6.72 **
17	2	-0.0043	-0.55
18	1	-0.0036	NA
19	1	-0.0036	NA
≥2	1463	-0.0150	-9.43 ***
Difference: 1 vs. ≥2		0.0140	4.86 ***

Table 2, continued

Panel B: Frequent vs. Infrequent Acquirers

Acquirer Type	Number of Deals	CAR(-1,1)	t-stat
Infrequent	1,566	-0.0001	-0.03
Frequent			
1st Deals	640	-0.0031	-1.16
≥ 2nd Deals	1,463	-0.0150	-9.43***
Diff: 1st Infreq – 1st Freq		0.0030	0.72

Panel C: Method of Payment

Deal Order		Cash	Mixed	Stock
1st Deals	CAR(–1,1)	0.0123***	0.0025	-0.0120***
	N	574	730	902
≥ 2nd Deals	CAR(–1,1)	-0.0005	-0.0140***	-0.0210***
	N	298	398	767
Difference	CAR	0.0128***	0.0165***	0.0090*

***, **, and * denote significance at the 1, 5, and 10 percent level.

Table 3
Acquirer and Deal Characteristics by Deal Order

Sample consists of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. Assets and Market value of equity are expressed in millions of constant 1980 dollars where assets are deflated by the CPI and the market value of equity is deflated using the CRSP value-weighted market portfolio return. Market value of equity is measured two trading days prior to the announcement, and Assets and other Compustat data are from the fiscal year end prior to the announcement. Tobin's *q* is calculated as total assets minus book equity plus the market value of equity all divided by total assets. Operating cash flow is cash flow from operations from the statement of cash flows (if this item is unavailable then operating cash flow is sales minus the sum of costs of good sold, SG&A, and changes in working capital), standardized by assets. Relative size is the ratio of deal value to the acquirer's market value of equity. Conglomerate Deal equals one if the acquirer and target are in the same two-digit SIC code and zero otherwise. Tender equals one if the acquirer makes a tender offer and zero otherwise. Hostile equals one if SDC classifies the acquisition as hostile and equals zero otherwise. Cash Deal equals one if the method of payment is all cash and zero otherwise. Equity Deal equals one if the method of payment is all equity and zero otherwise. Competition equals one if other bidders exist and equals zero otherwise. Liquidity Index is the value of all corporate control transactions with a value greater than 1 million reported by SDC for each year and 2-digit SIC code, divided by the total assets of Compustat firms in the same year and 2-digit SIC code. Financial firm equals one if the acquirer's SIC is between 6000 and 6999 and equals zero otherwise.

	1st Deals			≥2nd Deals			Difference	
Acquirer Characteristics	N	Mean	Median	N	Mean	Median	Mean	Median
Assets	2,051	2,243	295	1,380	8,326	2,193	-6,084***	-1,898***
Market Value of Equity	2,234	271	47	1,468	627	217	-356***	-170***
Tobin's *q*	2,050	4.12	1.45	1,380	2.12	1.18	2.01***	0.27***
Long-term debt/assets	2,027	0.17	0.11	1,374	0.15	0.09	0.01**	0.02
Operating cash flow/assets	2,021	0.05	0.06	1,375	0.06	0.03	0.00	0.03***
Deal Characteristics								
Relative size of target to acquirer	2,234	0.65	0.28	1,468	0.35	0.12	0.30***	0.16***
Conglomerate deal	2,234	0.35		1,466	0.29		0.05***	
Tender	2,234	0.18		1,468	0.14		0.04***	
Hostile	2,234	0.02		1,468	0.02		0.00	
Cash Deal	2,234	0.26		1,468	0.21		0.06***	
Equity Deal	2,234	0.41		1,468	0.52		-0.11***	
Competition	2,234	0.03		1,468	0.02		0.00	
Liquidity index	2,234	0.60	0.01	1,466	0.04	0.01	0.56	0.00***
Financial firm	2,234	0.29		1,468	0.53		-0.25***	

***,**, and * denote significance at the 1, 5, and 10 percent level.

Table 4
Previous Acquisition Activity and the Likelihood of Acquiring

Logit analysis of the determinants of being an acquirer. Sample is all firm-years from 1985-2002 with nonmissing data from Compustat and CRSP required to calculate control variables. The left hand side variable equals one if the firm acquires a public company in a given year and zero otherwise. Leverage is defined as total debt divided by assets minus book equity plus the market value of equity. Free Cash Flow is operating income before depreciation minus the sum of interest expense, income taxes and preferred dividends, standardized by assts. Tobin's *q* is calculated as total assets minus book equity plus the market value of equity all divided by total assets. Market Return $_{t-1}$, Industry Return $_{t-1}$, and Firm Return $_{t-1}$ are annual stock returns to the CRSP value-weighted market index, a value-weighted industry portfolio (same 2-digit SIC code), and to the firm over the previous year. Economy Acquisition Activity and Industry Acquisition Activity are measured as the natural log of one plus the number of deals greater than 1 million dollars reported by SDC in the previous year for the entire economy and for the industry (same 2-digit SIC code), respectively. Firm's Previous Acquisitions is the natural log of one plus the number of acquisitions by the firm over the previous five years reported by SDC.

	Coefficient	χ^2 statistic
Intercept	-6.6780	726.43***
Ln(Assets)	0.2999	958.91***
Leverage	-1.5276	106.17***
Free Cash Flow/Assets	0.1338	4.06**
Tobin's *q*	0.0135	9.28***
Cash/Assets	0.2868	4.83**
Market Return $_{t-1}$	0.6892	20.92***
Industry Return $_{t-1}$	-0.0627	0.64
Firm Return $_{t-1}$	0.1058	45.97***
Economy Acquisition Activity	0.1903	17.05***
Industry Acquisition Activity	0.1681	102.54***
Firm's Previous Acquisitions	1.3506	1037.52***
Likelihood Ratio (DF=11)	4464.04***	
Percent Concordant	80.14	
Observations	99,807	

***,**, and * denote significance at the 1, 5, and 10 percent level.

Table 5
Regressions of Acquirer Abnormal Return on Deal Order

Regression of acquirer abnormal return (CAR) around announcement. Sample is of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. CAR is the cumulative abnormal return measured over the event window (-1,1) where day 0 is the announcement date. The abnormal return is calculated based on market model parameters estimated over days –250 to –21. Assets are in constant 1980 dollars (deflated by the CPI). Relative size is the ratio of deal value to the acquirer's market value of equity. Tobin's *q* is calculated as total assets minus book equity plus the market value of equity all divided by total assets. Liquidity Index is the value of all corporate control transactions with a value greater than 1 million reported by SDC for each year and 2-digit SIC code, divided by the total assets of Compustat firms in the same year and 2-digit SIC code. Operating cash flow is cash flow from operations from the statement of cash flows. If this item is unavailable then operating cash flow is sales minus the sum of costs of good sold, SG&A, and changes in working capital. Pr(Acquisition) is the firm's estimated probability of an acquisition based on the logit results presented in Table 4. Conglomerate Deal equals one if the acquirer and target are in the same two-digit SIC code and zero otherwise. Tender equals one if the acquirer makes a tender offer and zero otherwise. Hostile equals one if SDC classifies the acquisition as hostile and equals zero otherwise. Cash Deal equals one if the method of payment is all cash and zero otherwise. Equity Deal equals one if the method of payment is all equity and zero otherwise. Competition equals one if other bidders exist and equals zero otherwise. Financial firm equals one if the acquirer's SIC is between 6000 and 6999 and equals zero otherwise. DealOrder≥2 is a dummy variable equal to one if the deal order is larger than 1 and zero otherwise. Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. t-statistics are adjusted using White's correction for heteroskedasticity.

	(1)	(2)
Intercept	0.0117	0.0235
	(1.40)	(2.22)**
Ln(Assets)	-0.0029	-0.0046
	(-2.79)***	(-3.30)***
Relative size of target to acquirer	0.0032	0.0018
	(2.54)**	(1.09)
Tobin's *q*	-0.0006	-0.0015
	(-2.89)***	(-1.86)*
Long-term Debt/Assets	0.0150	0.0118
	(1.28)	(0.84)
Liquidity Index	-0.0001	-0.0001
	(-15.35)***	(-13.80)***
Operating Cashflow	-0.0909	-0.0949
	(-2.89)***	(-2.67)***
Pr(Acquisition)		0.0277
		(2.59)***
Conglomerate	0.0056	0.0036
	(1.39)	(0.85)
Tender	0.0102	0.0093
	(2.61)***	(2.26)**
Hostile	-0.0081	-0.0043
	(-1.06)	(-0.55)
Cash Deal	0.0154	0.0159
	(4.22)***	(4.11)***
Equity Deal	-0.0111	-0.0103
	(-2.85)***	(-2.43)**
Competition	-0.0143	-0.0101
	(-1.71)*	(-1.14)
Financial Firm	0.0098	0.0077
	(2.36)**	(1.57)
(DealOrder ≥ 2)	-0.0069	-0.0099
	(-2.51)**	(-2.95)***
Adj R2	0.0556	0.0582
N	3,357	2,872

***,**, and * denote significance at the 1, 5, and 10 percent level.

Table 6
Post Acquisition Stock Performance among Frequent and Infrequent Acquirers

Sample consists of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. BHER is the three-year buy-and-hold excess return and is equal to the acquirer's cumulative three year return minus the return on a size and book-to-market matched portfolio using the methodology prescribed in Lyon, Barber and Tsai (1999). We also report skewness adjusted t-statistics as recommended by Lyon, Barber and Tsai (1999). Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. A frequent acquirer is defined as a firm that has two or more deals within a five-year period.

Panel A: Acquirer's Deal Order

Deal Order	Number of deals	BHER	Skewness-adjusted t-statistic
1	1,983	-0.0480	-1.83*
2	637	0.0331	1.12
3	271	0.0051	0.14
4	147	0.0312	0.59
5	89	0.0302	0.46
6	52	0.0417	0.54
7	33	0.0787	0.68
8	23	0.0763	0.63
9	17	-0.1059	-0.89
10	9	0.0388	0.28
11	7	-0.0439	-0.47
12	7	-0.1387	-1.23
13	7	-0.1191	-2.19*
14	6	-0.0733	-0.76
15	5	-0.1871	-1.52
16	3	0.0655	0.39
17	2	0.0274	-1.83
18	1	-0.0169	1.12
19	1	-0.0419	0.14
≥ 2	1,317	0.0239	1.27

Table 6, continued

Panel B: Method of Payment

Deal Order		Cash	Mixed	Stock
1st Deals	BHER	-0.0195	-0.0760	-0.0432
	N	511	658	814
≥ 2nd Deals	BHER	0.0907**	-0.0212	0.0220
	N	261	356	700

Panel C: Frequent vs. Infrequent Acquirers

Acquirer Type	Number of Deals	BHER	Skewness-adjusted t-statistic
Infrequent	1,390	-0.1227	-3.36***
Frequent			
1st Deals	593	0.1271	3.50***
≥ 2nd Deals	1,317	0.0239	1.27

***,**, and * denote significance at the 1, 5, and 10 percent level.

Table 7
Post Acquisition Stock Performance by Future Acquisition Activity

Sample consists of all completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1985-1997. We limit the sample to no later than 1997 because we stratify BHERs by whether acquirers go on to acquire again in over the five years following the deal (which we can only measure for deals through 1997). BHER is the three-year buy-and-hold excess return and is equal to the acquirer's cumulative three year return minus the return on a size and book-to-market matched portfolio using the methodology prescribed in Lyon, Barber and Tsai (1999). We also report skewness adjusted t-statistics as recommended by Lyon, Barber and Tsai (1999). Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. A frequent acquirer is defined as a firm that has two or more deals within a five-year period.

Panel A: BHERs by whether the firm acquires again in the five years following an acquisition.

	All acquirers (1985-1997)		Acquirers that acquire again within 5 years		Acquirers that do not acquire again within 5 years	
Deal Order	N	BHER	N	BHER	N	BHER
1	1,362	-0.0426	432	0.1894***	930	-0.1504***
2	430	0.0565	229	0.1430***	201	-0.0420
3	173	0.0409	112	0.1097**	61	-0.0855
4	98	0.0807	73	0.1432*	25	-0.1016

Panel B: Proportion of deals followed by another deal within five years and proportion of positive BHERs.

Deal Order	N	% of acquirers with positive BHERs	% of acquirers that acquire again within 5 years
1	1,362	39.79***	31.72***
2	430	50.47	53.26
3	173	50.87	64.74***
4	98	52.04	74.49***
5	52	57.69	73.08***
6	32	46.88	81.25***
7	24	62.50	95.83***
8	16	50.00	100.00***
9	10	30.00	100.00***
10	5	40.00	100.00*
11	4	50.00	100.00
12	3	33.33	100.00
13	2	50.00	100.00
14	2	50.00	100.00
15	2	0.00	100.00

***, **, and * denote significantly different from 50% at the 1, 5, and 10 percent level.

Table 8
Returns Following Previous Acquisition Experience and the Likelihood of Acquiring

Logit analysis of the determinants of being an acquirer. Sample is all firm-years from 1985-2002 with nonmissing data from Compustat and CRSP required to calculate control variables. The left hand side variable equals one if the firm acquires a public company in a given year and zero if it does not acquire in that year. Leverage is defined as total debt divided by assets minus book equity plus the market value of equity. Free Cash Flow is operating income before depreciation minus the sum of interest expense, income taxes and preferred dividends. Tobin's *q* is calculated as total assets minus book equity plus the market value of equity all divided by total assets. Market Return $_{t-1}$, Industry Return $_{t-1}$, and Firm Return $_{t-1}$ are annual stock returns to the value-weighted market portfolio, a value-weighted industry portfolio (same 2-digit SIC code), and to the firm over the previous year. PastDeal is a dummy variable equal to one if the firm engaged in an acquisition in the preceding five years and equals zero else. Economy Acquisition Activity and Industry Acquisition Activity are measured as the natural log of one plus the number deals greater than 1 million dollars reported by SDC in the previous year for the entire economy and for the industry (same 2-digit SIC code), respectively. Firm's Previous Acquisitions is the natural log of one plus the number of acquisitions by the firm over the previous five years reported by SDC.

	Coefficient	χ^2 statistic
Intercept	-6.6707	723.56***
Ln(Assets)	0.3000	958.68***
Leverage	-1.5077	103.46***
Free Cash Flow/Assets	0.1353	4.13**
Tobin's *q*	0.0133	8.44***
Cash/Assets	0.2922	4.97**
Market Return $_{t-1}$	0.6957	21.27***
Industry Return $_{t-1}$	-0.1146	2.05
Firm Return $_{t-1}$	0.0739	15.30***
(Firm Return $_{t-1}$)x(PastDeal)	0.2257	28.63***
Economy Acquisition Activity	0.1907	17.09***
Industry Acquisition Activity	0.1703	105.24***
Firm's Previous Acquisitions	1.3007	912.81***
Likelihood Ratio (DF=12)	4672.96***	
Percent Concordant	80.4	
N Obs	99,807	

***,**, and * denote significance at the 1, 5, and 10 percent level.

Table 9
Net Insider Purchase of Stock Prior to Acquisitions

Sample consists of 3,276 completed mergers and acquisitions of publicly traded US targets made by publicly traded US acquirers in the period 1987-2002. We limit the sample to later than 1986 since Thomson Financial insider trading data starts from 1986. Net Purchase Ratio (NPR) is calculated as the number of shares acquired through open market or private purchases and through option exercises, minus the number of shares sold, all divided by total insider transactions. Total insider transactions is the number of shares acquired through open market or private purchases and through option exercises, plus the number of shares sold. NPR is calculated based on top management's trading during 180 days before the acquisition announcement. The cross-sectional benchmark is the average NPR for a size-matched portfolio of non-acquiring firms during 180 days before the acquisition announcement. The time-series benchmark is the acquiring firm's NPR measured from days [-360, 180) before the announcement of the firm's first deal in the preceding five years.

Deal Order	N	Net Purchase Ratio	Cross-Sectional Adjusted Net Purchase Ratio	Time-Series Adjusted Net Purchase Ratio
1	1,945	0.063***	0.016	-0.011
2	632	0.131***	0.089***	0.029
3	267	0.154***	0.106***	0.032
4	155	0.179***	0.138***	0.051
5	96	0.210***	0.157**	0.096
6	55	0.270***	0.220***	0.131
7	37	0.403***	0.357***	0.426***
8	23	0.482***	0.447***	0.353**
9	17	0.232	0.180	-0.119
10	10	0.226	0.166	-0.074
11	7	0.429*	0.378	0.286
12	7	0.346	0.280	0.203
13	7	-0.040	-0.105	-0.183
14	6	0.164	0.116	-0.002
15	5	0.000	-0.058	-0.400
16	3	0.333	0.288	-0.333
17	2	0.787	0.792	0.287
18	1	0.000	0.047	0.000
19	1	0.000	0.047	0.000
1	1,945	0.063***	0.016	-0.011
>=2	1,331	0.171***	0.127***	0.054***
Difference		-0.108***	-0.111***	-0.065***

***,**, and * denote significance at the 1, 5, and 10 percent level.

Appendix Table A1
Acquirer Abnormal Returns among Frequent and Infrequent Acquirers

Sample consists of all completed mergers and acquisitions of private, subsidiary, and publicly traded US targets made by publicly traded US acquirers in the period 1985-2002. Deal order is based on the number of deals the acquirer announced in the previous five years. For example, a deal order value of 3 suggests the acquirer announced two acquisitions in the five years prior to the current deal. The figures for *Public Targets* and *Private Targets* is based on Deal Order calculated for the combined sample (*All Targets)*. A frequent acquirer is defined as a firm that has two or more deals within a five-year period. CAR is the cumulative abnormal return measured over the event window (-1,1) where day 0 is the announcement date. The abnormal return is calculated based on market model parameters estimated over days –250 to –21. t-statistics are calculated based on the cross-sectional standard deviation of the CARs.

Panel A: Acquirer's Deal Order

	All Targets		*Public Targets*		*Private Targets*	
Deal Order	Number of deals	CAR(-1,1)	Number of deals	CAR(-1,1)	Number of deals	CAR(-1,1)
1	4,288	0.0192 ***	1,640	0.0087	2,089	0.0278 ***
2	1,826	0.0036 *	805	-0.0110 ***	815	0.0139 ***
3	873	0.0024	438	-0.0150 ***	361	0.0096 ***
4	447	-0.0010	225	-0.0170 ***	192	0.0151 **
5	304	-0.0080 **	178	-0.0200 ***	110	0.0077
6	206	-0.0070 *	122	-0.0180 ***	70	0.0075
7	113	0.0004	64	-0.0050	45	0.0099
8	92	-0.0140 ***	53	-0.0200 ***	35	-0.0010
9	70	-0.0110	45	-0.0200 ***	23	0.0051
10	41	0.0045	22	-0.0040	17	0.0137
11	24	0.0039	15	-0.0160	8	0.0312
12	17	0.0090	9	-0.0310	8	0.0536
13	14	0.1260	7	-0.0310 ***	5	0.0602
14	14	0.0128	9	-0.0070	14	0.0481
15	10	0.0060	6	-0.0050	3	0.0363
16	12	0.0043	8	-0.0250 **	4	0.0639
17	12	0.0040	9	-0.011	2	0.0746
18	8	0.0180	5	-0.0080	2	0.0821
19	5	0.0149	3	-0.0330	2	0.0871
20	5	0.0460	3	0.0112	1	0.1931
21	3	0.0591	1	0.0034	2	0.0870
22	3	0.0531	1	-0.0003	2	0.0798
23	2	0.1383	1	0.08350	1	0.1931
≥ 2	4,101	0.0010	2,029	-0.0140 ***	1,713	0.0157 ***
Difference: 1 vs. ≥ 2		0.0182 ***		0.0171 ***		0.0122 ***

Table A2, continued

Panel B: Frequent vs. Infrequent Acquirers

	All Targets		*Public Targets*		*Private Targets*	
Acquirer Type	Number of Deals	CAR(-1,1)	Number of Deals	CAR(-1,1)	Number of Deals	CAR(-1,1)
Infrequent	2,677	0.0214***	1,015	0.0061	1,318	0.0306***
Frequent						
1st Deals	1,611	0.0157***	625	-0.0024	771	0.0232***
≥ 2nd Deals	4,101	0.0010	2,029	-0.0140***	1,713	0.0157***
Diff: 1st Infreq – 1st Freq		0.0057		0.0085		0.0074

Panel C: Method of Payment

Acquisitions of Public and Private Targets

Deal Order		Cash	Mixed	Stock
1st Deals	CAR(−1,1)	0.0162***	0.0223***	0.0181***
	N	1,029	1,633	1,626
≥ 2nd Deals	CAR(−1,1)	0.0117***	0.0020	-0.0040*
	N	839	1,222	2,040
Difference	CAR	0.0045	0.0203***	0.0220***

Acquisitions of Public Targets

Deal Order		Cash	Mixed	Stock
1st Deals	CAR(−1,1)	0.0120***	0.0060	-0.0060
	N	464	539	637
≥ 2nd Deals	CAR(−1,1)	0.0034	-0.0120***	-0.0230***
	N	408	589	1,032
Difference	CAR	0.0086*	0.0177***	0.0162**

Acquisitions of Private Targets

Deal Order		Cash	Mixed	Stock
1st Deals	CAR(−1,1)	0.0174***	0.0279***	0.0319***
	N	351	842	896
≥ 2nd Deals	CAR(−1,1)	0.0222***	0.0137***	0.0148***
	N	277	507	929
Difference	CAR	-0.0050	0.0142**	0.0171***

***, **, and * denote significance at the 1, 5, and 10 percent level.