Win-Stay, Lose-Shift: A Strategy of Serial Acquirers*

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Abstract

We show that serial acquirers over-extrapolate from their own past experiences while making future acquisition decisions: firms likely repeat (avoid) choices that have led to good (bad) outcomes from the past, even after controlling for aggregate time-series shocks, economic factors, rational learning about acquisition skill, and firm fixed effects. We also find that a firm experiencing high announcement returns in early acquisitions has a higher chance of becoming a serial acquirer. Moreover, serial acquirers with greater positive (negative) return experiences are more likely to initiate value-destroying (value-enhancing) mergers in terms of both market reaction and operating performance. This behavior is consistent with a reinforcement learning heuristic. We also discover that higher institutional ownership mitigates serial acquirers' excessive acquisitiveness following good experiences, whereas financial expertise on corporate boards helps identify value-enhancing deals after bad outcomes. Finally, CEO overconfidence increases after past firm successes, but remains immune to failures. Hence, past successes provoke future mergers by making managers more overconfident whereas negative experiences directly curb serial acquirers' acquisitiveness.

Keywords: Serial Acquirers, Mergers and Acquisitions, Corporate Governance, Reinforcement Learning, Overconfidence

JEL CLASSIFICATIONS: D81, G02, G14, G34

A significant portion of mergers and acquisitions in the U.S. is made by serial acquirers[1]. In a sample of 17,083 mergers from 1980 to 2013, 82.92% of deals are made by serial acquirers, accounting for 91.03% of transaction value. Despite of the economic significance of M&A activities by these serial acquirers, little is known about the motives and performance of these firms (Karolyi, Liao, and Loureiro, 2015). Notable exceptions are Fuller, Netter, and Stegemoller (2002), Billett and Qian (2008), Ahern (2010), and Karolyi, Liao, and Loureiro (2015). However, these studies primarily focus on the pattern of decreasing announcement returns from first to subsequent deals and try to find credible explanations for this pattern. Instead of focusing on the decreasing return pattern, we investigate behavioral biases of serial acquirers within the dynamics of the acquisition decision to understand who becomes a serial acquirer, what drives its subsequent merger decisions, what the value consequences are, and the role of corporate governance.

Using a large sample of U.S. firms from 1980 to 2013, we find that past acquisition return experiences (over 3, 5, or 10 years), measured as the 3-day announcement returns, significantly and strongly predict future acquisition likelihood. These results are robust to controlling for standard merger determinants such as Q, size, leverage and cash flow, and using firm fixed effects to remove the impact of time-invariant firm characteristics. In addition, M&A strategies of previously successful acquisition, such as a private target or a within industry acquisition, are more likely to be repeated in the next acquisition as well. Interestingly, long run positive return experiences predict a higher likelihood (*reinforcement*) of future acquisitions while short-run negative return experiences predict a lower likelihood (*punishment*) of future acquisitions[2]. Moreover, we find that firms experiencing higher announcement returns in early acquisitions have a higher chance to become serial acquirers. We interpret these findings as reinforcement learning by serial acquir-

[1]There is no general consensus on the definition of serial acquirers. In this paper, we define serial acquirers as firms that made acquisitions in more than one year over the sample period. We use this definition for the following two reasons. First, since we examine whether past M&A return experiences affect subsequent merger decisions, we require enough time between prior and subsequent deals to make past announcement returns a feedback in the subsequent merger decisions. Second, we avoid classifying firms with a single program of acquisitions with multiple deals as serial acquirers. Our main results are qualitatively similar once we define serial acquirers as firms that acquired more than five acquisitions over the sample period as in Karolyi, Liao, and Loureiro (2015).

[2]The terms, *reinforcement* and *punishment*, are from Skinner (1953)

ers.

Reinforcement learning is a simple model of learning posited by the psychology literature based on the law of effect (Thorndike, 1898; Skinner, 1953): Choices that lead to good (bad) outcomes in the past are more likely to be repeated (shunned) in the future, even if this past success (failure) does not logically predict future success (failure) [3]. Corporate takeovers are one area of investigation in which the evidence from the psychology literature should be considered seriously for the following three reasons. First, M&A decisions are subject to the reinforcement learning heuristic since takeovers reflect an individual's, or at best a small group's (board of directors) decision (Malmendier and Tate, 2008; Malmendier and Zheng, 2012). Second, corporate mergers are an ideal setting to test reinforcement learning because immediate and clear feedback from the market is available at the deal level, which is usually not the case for most of the corporate decisions. Finally and of greatest importance, the economic impact of serial acquirers' behavioral biases will be stronger than that of individual investors'. While a large literature[4] decisively shows individuals do not always make rational decisions under uncertainty, it usually has little predictive content for market behavior. On the other hand, serial acquirers' behavioral biases have non-trivial economic consequences.

We find that serial acquirers with higher positive (negative) return experiences are more likely to initiate value-destroying (value-enhancing) mergers but less likely to engage in value-enhancing (value-destroying) ones. We interpret these findings as good acquisition experiences make acquirers to overestimate the value of subsequent deals, and hence to misclassify a negative NPV deal as a positive one. However, poor merger experiences lead firms to be more cautious (e.g. greater due diligence after a run of bad outcomes) in making subsequent decisions, as a result, the subsequent

[3]Erev and Roth (1998) find that a reinforcement learning model outperforms forward-looking models in predicting how games proceed in economics experiments. Charness and Levin (2005) show that when an optimal strategies conflict with a reinforcement learning strategy, individuals tend to follow the latter.

[4]Choi et al. (2009) find individuals increase their savings rate after a high average and/or low variance return and interpret this behavior as consistent with reinforcement learning. See also Benartzi (2001), Kaustia and Knüpfer (2008), Anagol, Balasubramaniam, and Ramadorai (2015), and Dittmar and Duchin (2016) for the applications in the finance.

deals turn out to be value enhancing ones in terms of acquirer shareholders' wealth. Further, greater positive (negative) return experiences are associated with a greater negative (positive) market reaction to current bids conditional on the firm announcing acquisitions. Consistent with these findings based on market reactions, we find that subsequent mergers of firms with positive prior return experiences underperform relative to those of firms with negative return experiences when performance is measured as industry-adjusted operating performance over three years after the merger completion. Thus, strategies that worked for the firm in the past are actually detrimental to shareholder value creation. These results provide strong support for reinforcement learning by firms and their CEOs.

It is crucial to examine value consequences to distinguish reinforcement learning from Bayesian (rational) learning. There could be two different types of rational learning that govern firms' merger decisions. The first type of rational learning assumes firms' acquisition skills are fixed and firms learn about their own talent by doing M&As. It may be rational for firms with high (low) skill to initiate more (less) acquisitions, which would be consistent with the prediction of reinforcement learning. However, we would expect to see high (low) past announcement returns be associated with value enhancing (value destroying) subsequent deals, which is a contrast to our findings. Another type of rational learning assumes a firm can improve its acquisition skill through serial acquisitions. We would see more value enhancing mergers in later acquisitions as serial acquirers enhance their acquisition skill[5]. Therefore, low past announcement returns may be associated with subsequent value-enhancing deals, which is consistent with our findings. However, we should not observe systematic negative value consequences of mergers after high announcement returns, which we find in this paper.

Next we explore the role of corporate governance in serial acquirers' reinforcement learning behavior. We use institutional ownership and financial expertise on corporate boards as proxies

[5]This prediction of the second type of rational learning is inconsistent with decreasing pattern of announcement returns that is documented in the literature. We also confirm the declining pattern of announcement returns in our sample.

for quality of corporate governance. Firms with higher institutional ownership are less likely to engage in value-destroying deals after positive return experiences whereas firms with a higher fraction of financial experts on boards are more likely to initiate value enhancing acquisitions after negative return experiences. Hence, institutional ownership mitigates serial acquirers' excessive acquisitiveness following good experiences, while financial expertise on boards helps identify value enhancing deals after bad outcomes.

We then examine the relative importance of firms and CEOs in explaining our findings. We find that CEO overconfidence can be predicted by past acquisition experiences of the acquirer. In particular, past positive acquisition experiences increase a CEO's overconfidence while past negative acquisition experiences have no effect. This result is consistent with one common source of overconfidence documented by the psychology literature - self-attribution bias (Langer and Roth, 1975). CEOs subject to self-attribution bias overcredit their role in bringing about good outcomes and overcredit external factors or bad luck with bad outcomes. Our results show that acquisition experiences at the CEO level coupled with their self-attribution bias can explain changes in their level of overconfidence. This finding is consistent with the argument in Billett and Qian (2008) even though they do not explicitly examine CEO overconfidence measure. One of the stark distinctions between Billett and Qian (2008) and our findings is the prediction for the negative experiences. Self-attribution bias predicts that negative return experiences do not affect CEO overconfidence, hence have no effect on firm's subsequent acquisitiveness. On the other hand, we find that negative return experiences discourage firms from initiating future acquisitions (punishment).

We also estimate models of acquisitiveness of serial acquirers with a horse race between past experiences (positive and negative) and CEO overconfidence. We find that CEO overconfidence partially subsumes the effect of positive return experiences. However, the negative return experiences do predict a significantly lower acquisition likelihood even in the presence of CEO overconfidence. This result suggests that poor acquisition return experiences at the firm level

help avoid future bad deals, perhaps due to greater due diligence after a run of bad outcomes.

We make three primary contributions to the literature. First, this paper extends the literature on serial acquirers by investigating their behavior from a new perspective. Prior studies primarily focus on the pattern of decreasing announcement returns from first to subsequent deals and provide evidence on possible explanations for this pattern: agency-cost explanations (Jensen, 2005; Karolyi, Liao, and Loureiro, 2015), opportunity set hypothesis (Klasa and Stegemoller, 2007), anticipation hypothesis (Fuller, Netter, and Stegemoller, 2002), and hubris hypothesis (Billett and Qian, 2008). In contrast to this literature, we focus on behavioral biases of serial acquirers within the dynamics of the acquisition decision to understand who becomes a serial acquirer, what the value consequences are, and the role of corporate governance in mitigating the biases.

Second, our paper builds upon the line of research investigating behavioral biases in corporate decisions. Malmendier and Tate (2005) and Malmendier and Tate (2008) document that CEO overconfidence affects capital expenditure and merger decisions. Malmendier, Tate, and Yan (2011) show that managers' early experiences on the Great Depression or military service influence corporate financing and investment. Dittmar and Duchin (2016) find that a manager's distress experience in a previous firm affects corporate leverage and investment in the current firm. Our paper is unique in that we study the effect of experiences in one domain of corporate policy (i.e., M&A) on the subsequent decisions in the same domain. By doing so, we are able to interpret our findings as strong evidence for reinforcement learning. Hence, our paper is also related to a strain of research on reinforcement learning heuristics at individual investor level (Benartzi, 2001; Kaustia and Knüpfer, 2008; Choi et al., 2009; Anagol, Balasubramaniam, and Ramadorai, 2015).

Our final contribution is to provide potential explanations for one particularly interesting observation reported in Table V of Moeller, Schlingemann, and Stulz (2005). Moeller, Schlingemann, and Stulz (2005) state "The firms that make large loss deals are *successful* with acquisitions until

they make their large loss deal.". Specifically, it documents that before these large loss deals firms successfully make public target and/or equity financed acquisitions and an overwhelming portion of large loss deals use these same strategies. After a large loss, the firms avoid engaging in M&As. They argue that these large loss deals cannot be fully reconciled with firm and deal characteristics, misvaluation driven acquisitions, or signals of lack of internal growth opportunities. We provide a possible additional explanation for this observation by showing extensive evidence for reinforcement learning, including deal strategy level evidence.

1 Data

We use the Securities Data Company's (SDC) U.S. Mergers and Acquisitions database for the analysis of corporate acquisition decisions. We consider a sample of firms that announced *at least one* acquisitions at any point between the fiscal year 1980 and 2013[6]. We require that the acquirer is a U.S. public company, that target is public, private, or subsidiary, that the acquirer has annual financial statement information available from the Compustat and stock return data from the Center for Research in Securities Prices (CRSP) Daily Stock Price and Returns file, and that the acquisition is completed. Following Harford, Humphery-Jenner, and Powell (2012) and Erel, Liao, and Weisbach (2012), we further require that the acquirer owns 100% of the target shares after the acquisition and eliminate acquisitions where the acquirer already holds more than 50% of the target shares before the announcement. We exclude leveraged buyouts (LBOs), spinoffs, recapitalizations, self-tender offers, exchange offers, repurchases, partial equity stake purchase, acquisitions of remaining interest, and privatizations. Finally, we require transaction value to exceed $ 1 million and to be at least 1% of the acquirer's market capitalization 11 days before the announcement date.

We measure cash flow as earnings before extraordinary items (IB) plus depreciation (DP), and capital as property, plants, and equipment (PPENT). We normalize cash flow with beginning-

[6]We start our analysis in 1983 because the shortest window for past acquisition experiences is three years.

of-year capital. We measure Q as the ratio of market value of assets to book value of assets. The market value of assets is defined as total assets (AT) plus market equity minus book equity. Market equity is defined as common shares outstanding (CSHO) times fiscal-year closing price (PRCC_F). Book equity is calculated as stockholders equity (SEQ) minus preferred stock liquidating value (PSTKL) plus balance sheet deferred taxes and investment tax credit (TXDITC) when available minus post-retirement assets (PPROR) when available[7]. The book value of assets is total assets and earnings are income before extraordinary items. Leverage is total debt (DLTT + DLC) over total assets at the beginning of the year. Size is the log of total assets at the beginning of the year where total asset is converted into December 2012 constant dollars using the Consumer Price Index for All Urban Consumers (CPI-U) inflation rates.

Relative size is the deal value divided by the market value of the bidding firm's equity 11 days prior to the announcement date, relatedness is an indicator variable set to one if the acquirer and target are operating in the same industries with a common two-digit Standard Industrial Classification code and zero otherwise, and friendly is a binary variable with a value of 1 if the bid is reported as friendly. Public, private, subsidiary are indicator variables having 1 if the bid is for a public, private, or subsidiary target respectively, and cash (stock) is a binary variable where 1 indicates that the acquisition was financed by 100% of cash (stock). To ensure that our results are not driven by outliers, we winsorize all relevant variables at the 1% level.

2 Measuring Past Acquisition Return Experiences

We construct three different types of measures for acquisition return experiences over the past 3, 5, and 10 year windows: *Transaction Value Weighted Return*, *Equally Weighted Return* and *Success Ratio*.

Transaction Value Weighted Return is a transaction value weighted average of announcement returns during the corresponding experience windows where announcement returns are either raw

[7]We closely follow the definitions of Q and its components as in Fama and French, 2002

returns or abnormal returns of the acquiring firm's stock over a three-day window starting one day before the announcement date (Equation (1)). Abnormal returns are the difference between raw returns and value-weighted market index returns. Similarly, we define *Equally Weighted Return* as an equally weighted average of announcement returns (Equation (2)).

$$\begin{aligned} &Transaction\ Value\ Weighted\ Return_{i,t} \\ &= \frac{\sum_{j=1}^{n_{i,t}^{(w)}} Transaction\ Value_{i,j} \times Announcement\ Return_{i,j}}{\sum_{j=1}^{n_{i,t}^{(w)}} Transaction\ Value_{i,j}} \end{aligned} \tag{1}$$

$$Equally\ Weighted\ Return_{i,t} = \frac{\sum_{j=1}^{n_{i,t}^{(w)}} Announcement\ Return_{i,j}}{n_{i,t}^{(w)}} \tag{2}$$

where $n_{i,t}^{(w)}$ is a total number of merger announcement of firm i at time t over the past w year window and j indicates corresponding past mergers. Stock market reaction may or may not be a correct measure of merger synergy, however, it is clear, immediate, and observable feedback from the market. Hence, firms consider it as perceived past acquisition performance (experiences) and do care about it when they make a merger decision.

From an economic point of view, *Equally Weighted Return* might be more appropriate measures for past acquisition experiences than *Transaction Value Weighted Return* in a sense that an economic impact of announcements on acquiring firms can be directly measured by announcement returns of their stocks *regardless* of transaction values of the corresponding acquisitions. In other words, announcement returns already take into account an economic effect of transaction values on acquiring firms' values. For instance, an abnormal announcement return would be close to zero if transaction value of the announced deal is negligible relative to the size of an acquirer.

On the other hand, past acquisition experiences could be formed by a *salience* weighted

announcement returns where corresponding transaction values proxy for the salience of past acquisitions. Large deals are salient not only because those deals are more likely to be deeply implanted in one's memory but also because such deals have a higher chance to be covered by leading business publications, which accentuates the level of salience. Therefore, we use *Transaction Value Weighted Return* as another measure of past acquisition experiences.

One of the shortcomings of the above mentioned two measures is that these measures can be dominated by one extreme announcement return. For this reason, we construct an alternative measure, *Success Ratio* as follows:

$$Success\ Ratio_{i,t} = \frac{\sum_{j=1}^{n_{i,t}^{(w)}} \mathbb{1}_{\{Announcement\ Return_{i,j}>0\}}}{n_{i,t}^{(w)}} \tag{3}$$

where $n_{i,t}^{(w)}$ is a total number of merger announcement of firm i at year t over the past w year window and j indicates corresponding past mergers. It is a ratio of number of successful deals to total number of deals during the past 3, 5, and 10 year windows. We define successful deals as ones with positive announcement returns.

3 Do Past Acquisition Return Experiences Provoke More Mergers?

3.1 Baseline Specification

We first test whether a firm exhibits reinforcement learning behavior when it makes a merger decision. Using the following fixed effects logit regression, we test if there is a positive association between acquisition return experiences and propensity to engage in subsequent mergers:

$$\begin{aligned} &Pr\{Y_{i,t} = 1 | Past\ Acquisition\ Experiences_{i,t},\ X_{i,t}\} \\ &= F(\beta_i + \beta_t + \beta_1 Past\ Acquisition\ Experiences_{i,t} + X_{i,t}^{'} B) \end{aligned} \tag{4}$$

where $Y_{i,t}$ is a binary variable having the value 1 if the firm i announced at least one merger bid in year t that was eventually completed; *Past Acquisition Experiences*$_{i,t}$ is our main variable, one of the following three measures over the past 3, 5, and 10 year windows: *Transaction Value Weighted Return*, *Equally Weighted Return* and *Success Ratio*; $X_{i,t}$ is a set of controls including size, Q, leverage and cash flow following the literature; β_i and β_t are firm and year fixed effects respectively; and F(.) is the logistic cumulative distribution function. We cluster standard errors by firm. We predict β_1, the coefficient on the past acquisition experiences, to be positive. We estimate Equation (4) with a conditional logit regression to include firm fixed effects and to avoid the incidental parameter problem (see Wooldridge, 2011 more in detail). Conditioning the likelihood on the total number of fiscal years with at least one merger in each firm, we avoid estimating the coefficients of fixed effects and estimate parameters of interest consistently.

Our main variable, past acquisition experiences, has two types of variations: cross-sectional and within-firm variations. Since we employ logit regressions with firm fixed effects, our estimation only exploits within-firm variations in the past merger experiences. Notice that firm fixed effects capture *time-invariant*, unobservable firm-specific acquisitiveness whereas past acquisition experiences are *time-varying* measures within a firm.

Using firm fixed effects in our model is crucial in a sense that we might obtain *spurious* positive β_1 from the cross-sectional variations in past acquisition experiences. Suppose a firm that is persistently good at doing acquisitions. The firm's ability will be positively associated with merger announcement returns and at the same time, the firm will engage more merger activities because it has competence in acquiring firms. Therefore, there could be a positive association between past acquisition experiences and frequency of acquisitions in the future even if firms do not exhibit reinforcement learning behavior in merger decisions. Given that our specification is stringent, finding positive β_1 is a strong evidence for reinforcement learning behavior.

Table 2 presents results from the fixed effects logit regressions in Equation (4) that are esti-

mated using a conditional logit specification. In Panel A of Table 2, we define *Past Acquisition Experiences* as *Transaction Value Weighted Return*. Column (1)-(3) use raw returns whereas column (4)-(6) use abnormal returns as announcement returns in constructing *Transaction Value Weighted Return*. We find significant positive coefficients on past acquisition experiences across all experience windows and also for both types of announcement returns. These results suggest that firms experiencing higher announcement returns on acquisitions significantly more likely to engage in merger activities in the following year. Using *Equally Weighted Return* and *Success Ratio*, we obtain similar results as shown in Panel B and C of Table 2.

To provide a sense of the economic magnitude of our results, we calculate marginal effects of one standard deviation increase in *Past Acquisition Experiences* on the probabilities of announcing acquisitions in the following year. Since the conditional logit estimation does not directly estimate the fixed effect coefficients, we are not able to calculate marginal effects from the conditional logit estimates. Hence, we adopt a linear probability model with year and firm dummy variables *only for* calculating the marginal effects[8]. In column (6) of Panel A, the marginal effect of *Past Acquisition Experiences* is 1.25%, which is 6.37% increase relative to the unconditional mean of the dependent variable (19.62%). This is economically meaningful in a sense that the marginal effect of *Past Acquisition Experiences* is greater than that of cash flow (0.83%), one of the most significant determinants of merger frequency.

Among the controls, we find that when firms have more cash flows they tend to be more acquisitive, since cash alleviates financing constraints. Higher investment opportunities, measured by Q, tend to lead more mergers. Finally, the effects of size and leverage on acquisitions are negative. Similar to the reasoning mentioned above for cash flows, firms with high leverage tend to be less acquisitive since they are more likely to be financially constrained.

[8]Linear probability model also yields significant positive coefficients on our main variables, *Past Acquisition Experiences* in all specifications.

A negative effect of size on acquisitiveness seems counterintuitive at a glance. However, this finding even *strengthens* the existence of positive effects of *Past Acquisition Experiences* on acquisitiveness. As pointed out in Moeller, Schlingemann, and Stulz (2004), size of acquiring firm is negatively associated with the announcement return regardless of the method of financing and status of targets. On the other hand, there could be a mechanical positive relation between size and acquisitiveness because the assets of a firm, in general, increase during a merger. Therefore, if there *were* no effect of *Past Acquisition Experiences* on acquisitiveness, we should obtain a negative mechanical relation between *Past Acquisition Experiences* and merger activities. Given this mechanical negative relation, finding positive effects of *Past Acquisition Experiences* on future merger activities is a strong evidence for reinforcement learning behavior. Indeed, if we omit *Past Acquisition Experiences* regressor, we find positive coefficient on size.

To complement the previous results, we also use the total number of deals for a given year as a dependent variable and estimate the effects of past acquisition experiences using the negative binomial or Poisson regression. Consistent with the previous results, firms experiencing higher announcement returns on acquisitions engage in a higher number of merger activities in the following year (not reported).

3.2 Deal Strategy Level Evidence

To strengthen our argument about reinforcement learning behavior, we now examine firms' behavior at the specific deal strategy level, public vs. private targets and within vs. across industry targets, using the following fixed effects logit regression:

$$
\begin{aligned}
&Pr\{Y_{i,t}^{Target\,\theta} = 1 | Past\ Acquisition\ Experiences_{i,t}^{Target\,\gamma},\ X_{i,t}\} \\
&= F(\beta_i + \beta_t + \beta_1 Past\ Acquisition\ Experiences_{i,t}^{Target\,\gamma} + X_{i,t}^{'} B) \\
&where\ \theta,\ \gamma \in \{public,\ private\}\ or\ \{within\ industry,\ across\ industry\}
\end{aligned}
\tag{5}
$$

where $Y_{i,t}^{Target\ \theta}$ is a binary variable having the value 1 if the firm i announced at least one merger bid of which target is type θ in year t; $Past\ Acquisition\ Experiences_{i,t}^{Target\ \gamma}$ is a transaction value weighted average of announcement returns of merger bids for type γ target during the past 10 years. We predict β_1 to be positive only when $\theta = \gamma$. In other words, acquisition experiences in a certain type of target will have more significant impact on future merger decisions in the same type of target than in other types of targets.

Panel A of Table 3 examines the status of target firms, either public or private target. Acquisition experiences in public targets significantly predict being an acquirer of public targets (significant coefficient of 1.37 in the specification (1)), but not of private targets (coefficient of 0.86 in the specification (2)). Similarly, acquisition experiences in private targets are significantly associated with acquisitiveness for private targets (1.12 in the specification (3)) whereas they fail to predict being an acquirer of public targets (-0.17 in the specification (4)).

In another domain of strategies, within and across industry targets, we obtain similar results (Panel B of Table 3). A firm that experienced high stock returns in announcing acquisitions for within industry targets is more likely to engage in the same type of deals in the following year (1.53 in the specification (1)). Experiences in across industry targets are also positively associated with a propensity of being an acquirer of across industry targets (0.62 in the specification (3)), but not significant. One possible reason of insignificance is that within industry targets are all in the same one industry, i.e., acquirer's industry, whereas across industry targets could be spread out in all other industries, leading to less predictive power. Overall, past M&A strategies of successful acquisition experiences are more likely to be repeated for the next acquisition.

3.3 Asymmetric Responses in Positive and Negative Experiences

To see if there are differential effects of positive and negative experiences, we separate *Past Acquisition Experiences* into two parts:

$$Positive\ Past\ Acquisition\ Experiences = Past\ Acquisition\ Experiences \times \mathbb{1}_{\{Past\ Acquisition\ Experiences \geq 0\}}$$

$$Negative\ Past\ Acquisition\ Experiences = -Past\ Acquisition\ Experiences \times \mathbb{1}_{\{Past\ Acquisition\ Experiences < 0\}}$$

Including positive and negative past acquisition experiences in our basic regression (4) yields the following:

$$\begin{aligned} &Pr\{Y_{i,t} = 1 | Past\ Acquisition\ Experiences_{i,t},\ X_{i,t}\} \\ &= F(\beta_i + \beta_t + \beta_1 Positive\ Past\ Acquisition\ Experiences_{i,j} \\ &\quad + \beta_2 Negative\ Past\ Acquisition\ Experiences_{i,t} + X_{i,t}^{'} B) \end{aligned} \tag{6}$$

In Table 4, the propensity to engage in subsequent mergers asymmetrically responds to past acquisition return experiences in positive and negative domains. Moreover, the patterns of the asymmetry vary across the experience windows. Whereas merger activities are more sensitive to the negative experiences in a short window (3 years), they are more responsive to the positive experiences in a long window (10 years).

3.4 Who Becomes Serial Acquirer?

Finally, we examine the role of past acquisition return experiences in becoming serial acquirer using the following fixed effects logit regressions.

$$\begin{aligned} &Pr\{Y_i^{SerialAcquirer} = 1 | Value\ Weighted\ CARs_{i,t},\ X_{i,t}\} \\ &= F(\beta_{ind} + \beta_t + \beta_1 Value\ Weighted\ CARs_{i,t} + X_{i,t}^{'} B) \end{aligned} \tag{7}$$

where $Y_i^{SerialAcquirer}$ is a binary variable having 1 if the firm i is classified as a serial acquirer; $Value\ Weighted\ CARs_{i,t}$ is our main variable, transaction value weighted announcement returns during the first fiscal year when the firm announces at least one acquisition[9]. We include industry and year fixed effects and firm-level control variables are at the same first year. Note that (7) is a *cross-sectional* regression where explanatory variables may come from different years across firms depending on the first fiscal year when the firm announces at least one acquisition. We expect $beta_1$ to be positive.

In Table 5, we find that firms experiencing high announcement returns in early acquisitions are indeed more likely to become serial acquirers. This is robust to the alternative definition of serial acquirers as used in Karolyi, Liao, and Loureiro (2015) (Column (2)).

4 Do Past Experiences Provoke More Value Destroying or Enhancing Mergers?

We investigate whether acquisition experiences make firms engage in more value-destroying or enhancing mergers, measured by the acquirer's announcement returns and by changes in operating performance.

4.1 Market Reaction

First, we examine whether acquisition experiences affect the propensity to engage in more value destroying or enhancing mergers by employing the same regression specification as Equation

[9]As a robustness test, we define serial acquirer as those acquired more than five targets over the sample period (Karolyi, Liao, and Loureiro (2015)). Corresponding definition of $Value\ Weighted\ CARs_{i,t}$ is transaction value weighted announcement returns of up to *first* five merger announcements over the sample period.

(6) but replacing $Y_{i,t}$ by either $Y_{i,t}^{VD}$ or $Y_{i,t}^{VE}$:

$$\begin{aligned} &Pr\{Y_{i,t}^{VD(VE)} = 1 | Past\ Acquisition\ Experiences_{i,t}, X_{i,t}\} \\ &= F(\beta_i + \beta_t + \beta_1 Positive\ Past\ Acquisition\ Experiences_{i,j} \\ &\quad + \beta_2 Negative\ Past\ Acquisition\ Experiences_{i,t} + X_{i,t}^{'} B) \end{aligned} \tag{8}$$

where $Y_{i,t}^{VD(VE)}$ is a binary variable where 1 indicates that the firm engages in value-destroying (VD)(or value-enhancing (VE)) mergers in a given year t. We use a sign of transaction value weighted average of abnormal returns in year t to define value destroying and value enhancing mergers. If the sign is negative (positive), a firm is classified as engaging in value destroying (value enhancing) mergers. We include firm and year fixed effects and cluster standard errors by firm.

Firms recently experienced high announcement returns may believe that subsequent acquisitions are likely to generate rewarding outcomes. As a consequence, they tend to overestimate cash flows from the candidate deals and to misclassify a negative NPV project as positive NPV project. Likewise, a firm with low market return upon past acquisition announcements becomes more cautious about selecting future merger deals, therefore, is less likely to participate in value-destructive deals. Accordingly, we expect that β_1, the coefficient on the positive acquisition experiences, is positive (negative) for value destroying (value enhancing) mergers whereas β_2, the coefficient on the negative acquisition experiences, is negative (positive) for value destroying (value enhancing) mergers.

Following a large body of prior literature, we view acquiring firm's stock returns around the announcement date as a proxy for the performance of acquisitions. This approach assumes that the market's assessment of the acquisition is an unbiased estimate of the impact of an acquisition on the wealth of acquirer's shareholders. These short-window returns are relatively less subject to misspecification than other measures of acquisition performance, such as long-window

return measures. Nevertheless, using announcement returns is subject to one concern that they may incorporate market's reassessment of the stand-alone value of the bidder (e.g. lack of internal growth opportunities). If this is the case, the first deal announced by a given acquirer will be the most affected one. Our specification (Equation (8)), by construction, does not use the first announced deal for every acquiring firm because it requires past acquisition experiences variable, which mitigates this inference problem. Moreover, in the next section, we examine operating performance after merger completion to directly gauge the value of the acquisition to the acquirer.

Panel A of Table 6 reports the results from the fixed effects logit regressions in Equation (8). The coefficients on *Positive Past Acquisition Experiences* are positive and significant in column (1), (3), and (5), but significantly negative in column (2), (4), and (6), suggesting that firms with higher positive return experiences are more likely to make value-destroying mergers but less likely to engage in value-enhancing mergers. The coefficients on *Negative Past Acquisition Experiences* are significantly negative in column (1), (3), and (5), but significantly positive in column (2), (4), and (6), indicating that firms with more negative return experiences are less likely to make value-destroying mergers but more likely to initiate value-enhancing mergers.

We interpret these results as positive announcement return experiences lead firms to overestimate cash flows from the subsequent deals, hence misclassify a negative NPV project as a positive NPV project. On the other hand, poor acquisition experiences make firms to be more cautious (e.g. greater due diligence after a run of bad outcomes) when making a subsequent merger decision, therefore, the merger turns out to be value enhancing one in terms of acquirer shareholders' wealth.

Interestingly, we find that firms are more responsive to past acquisition experiences in the *negative* domain than those in the *positive* domain for both value destroying and enhancing mergers. Formal statistical tests show that (absolute value of) coefficients on positive and negative experiences are significantly different from each other for all specifications but (5). For example, in

column (4), the coefficient on positive experiences (1.7395) is significantly different from that on negative experiences (7.2040) at the 1% level (p-value 0.000). This is consistent with *pessimism bias* that investors experiencing losses form overly pessimistic beliefs about investment options due to an overreaction to low outcomes in the negative domain relative to positive domain (Kuhnen, 2015). Hence, our finding provides real-world evidence on pessimism bias that is consistent with Kuhnen (2015)'s experimental findings.

Second, given that a firm announces a merger, we examine cumulative abnormal returns of the acquiring firm's stock around the announcement date:

$$\begin{aligned} CAR[-1,+1]_{i,j,t} = \beta_i + \beta_t + \beta_1 Positive\ Past\ Acquisition\ Experiences_{i,t} \\ + \beta_2 Negative\ Past\ Acquisition\ Experiences_{i,t} + X_{i,t}^{'} B + Y_{i,j}^{'} C + \epsilon_{i,j,t} \end{aligned} \tag{9}$$

where $CAR[-1,+1]_{i,j,t}$ is a cumulative abnormal return on the bidder i's stock over a three-day window around the announcement date of merger bid j in fiscal year t, *Positive* (*Negative*) $Past\ Acquisition\ Experiences_{i,t}$ is based on a transaction value weighted average of announcement returns over the past 3, 5, and 10 year windows, $X_{i,t}$ is a set of firm characteristics of firm i at year t, and $Y_{i,j}$ is a set of deal characteristics of deal j by firm i.

Closely following Harford, Humphery-Jenner, and Powell (2012), we include an extensive list of explanatory variables that are known to determine acquirer returns in the literature. We use size, Q, leverage, and cash flow for firm characteristics. Deal characteristics are relative size, industry relatedness of the target, friendly dummy, a set of target listing status dummies, and a method of payment. We also include firm and year fixed effects to control both for time trends in market reactions to merger bids and for the potential persistence of market reactions within a firm. We cluster standard errors by firm because firms may have unobservable acquisition skill, thus announcement returns may be autocorrelated within the firm. We predict β_1 to be negative whereas β_2 to be positive.

Panel B of Table 6 shows the result of estimating Equation (9). The market reaction is significantly negatively associated with *Positive Past Acquisition Experiences* and positively related to *Negative Past Acquisition Experiences*. The effect of acquisition experiences on the future announcement returns is economically significant as well. One standard deviation increase in positive acquisition experiences leads to 1.10%, 1.28%, or 1.59% decrease in three-day abnormal returns to a subsequent deal announcement, whereas one standard deviation increase in negative acquisition experiences leads to an increase of 1.85%, 1.27%, or 1.50% three-day abnormal returns to a subsequent merger announcement when acquisition experiences are measured as transaction value weighted average of announcement returns over the past 3, 5, 10 year windows respectively.

These results can be viewed as the market discounts the bids that might be sub-optimally induced from good acquisition experiences by knowing that the heightened acquisitiveness leads to an increased propensity to take negative NPV mergers. Similarly, the market appreciates the merger bids that are subsequent to poor acquisition experiences.

These results in Table 6 also help us to rule out the alternative explanation that firms may learn about their M&A skills through successful experiences. It is reasonable that firms with high past announcement returns may learn about their superior skills at acquiring firms, hence engage in more takeover activities afterward. If this were true, we should observe both positive association between positive acquisition experiences and value-enhancing merger frequencies and persistence in announcement returns over time. However, the result in this table is inconsistent with firms learning about their acquisition skills.

4.2 Operating Performance

While announcement returns reflect market's expectations of the merger, operating performance can measure the merger's performance ex-post. We examine the post-merger operating performance of positive and negative return experience groups in a univariate setting and in a multivariate framework. We use return on assets (ROA) to measure operating performance.

As discussed by Healy, Palepu, and Ruback (1992), accounting earnings and book value of assets can be largely affected by the choice of payment and the accounting method for the transaction. If an acquisition is financed by debt or cash, the acquirer's post-merger earnings will be lower than if the same transaction is exchanged by stock, because net income is calculated after deducting interest expense, but before dividends. If the acquirer chooses purchase accounting method, it recognizes the target's identifiable assets and liabilities at their fair market value and then recognizes the excess payment over the fair market value as goodwill. In contrast, under the pooling-of-interest method, the book values of the target's assets and liabilities are simply added to the acquirer's balance sheet, thus no goodwill is recorded[10]. Since the fair value of assets plus goodwill typically exceeds the book value of assets, purchase method results in lower earnings in subsequent years due to higher amortization and depreciation expenses[11]. Finally, the purchase method consolidates financial statements of the acquirer and the target from the date of the transaction whereas the pooling method consolidates the results of two firms from the beginning of the year of merger. Hence, higher earnings are reported for the first year of the merger under pooling than under purchase method.

To deal with the concerns about the effects of financing and accounting method on *reported earnings*, we use operating income before interest, taxes, depreciation, and amortization as the numerator of our operating performance measure. In addition, to mitigate the effects of financing and accounting method on *asset base*, we use the average of goodwill-adjusted total assets as the denominator of our measure. While ROA with goodwill measures the acquirer's ability to create value over the premium paid for acquisitions, ROA without goodwill is a more proper measure of the acquirer's performance compared with that of its peers[12]. Custódio (2014) finds that ad-

[10]SFAS 141(Business Combination) rules out the use of pooling-of-interest method for acquisitions undertaken after June 30, 2001. Prior to SFAS 141, acquirers were allowed to use pooling method in "mergers of equals" where the transaction satisfies 12 requirements mostly related to deal structure and firm characteristics.

[11]SFAS 142 (Goodwill and Other Intangible Assets) removes goodwill amortization and requires firms to perform a two-step impairment test at least annually, effective with fiscal years beginning after December 15,2001. Prior to SFAS 142, goodwill was amortized over its useful life no longer than 40 years.

[12]Our results remain unchanged when we do not subtract goodwill from total assets.

justing goodwill from book assets significantly decrease q-based measures of the diversification discount, suggesting the importance of considering the difference between the acquirer's and its industry peers' book assets due to goodwill recognition from merger transactions. Therefore, we define ROA as operating income before interest, taxes, depreciation, and amortization (EBITA) scaled by the average of goodwill-adjusted total assets (AT - GDWL).

In the univariate test, we follow the extant literature and use industry-adjusted changes in ROA around mergers to examine the effect of acquisition experiences on post-merger performance. We divide each acquisition into either Positive or Negative Return Experience group based on the acquirer's experiences over the past 10 years. We examine time-series of operating performance of acquirer from fiscal years t-3 to t+3 where t indicates merger completion year. Since operating performance may be affected by industry-wide factors, we subtract the median value of ROA in the same Fama-French 48 industry from the acquirer's ROA. Due to the possibility of preexisting differences in operating performance between Positive and Negative Return Experience groups, we compute changes in three-year average ROA from pre(t-3 to t-1) to post(t+1 to t+3) merger period and compare these changes between two groups.

Next, to investigate the performance changes around mergers in a multivariate setting, we regress ROA of each year from t-3 to t+3 excluding merger completion year t on the acquisition experiences controlling for the same set of firm and deal characteristics as used in the previous analysis. As discussed in Gormley and Matsa (2014), using industry-adjusted dependent variable to control for unobserved heterogeneity across industries produces inconsistent estimate. In contrast, including industry fixed effects generates consistent estimates. Hence we include industry fixed effects with dependent variable being ROA of acquirer (*not* industry-adjusted ROA).

Specifically, we estimate following OLS regression:

$$\begin{aligned} ROA_{i,j,t} = {} & \beta_{ind} + \beta_t + \beta_1 Positive\ Return\ Experiences\ Group_{i,t} \\ & + \beta_2 POST_{i,j,t} + \beta_3 Positive\ Return\ Experiences\ Group_{i,t} \times POST_{i,j,t} \\ & + X'_{i,t} B + Y'_{i,j} C + \epsilon_{i,j,t} \end{aligned} \tag{10}$$

where $ROA_{i,j,t}$ is acquirer i's ROA for corresponding deal j in one of the years from t-3 to t+3 excluding the merger year, $Positive\ Return\ Experiences\ Group_{i,t}$ is a binary variable where 1 indicates positive transaction value weighted average of abnormal returns over the past 10 years, and 0 otherwise. POST is a binary variable where 1 indicates post-merger period for deal j, and 0 otherwise. $X_{i,t}$ is the same set of firm characteristics of firm i at year t, and $Y_{i,j}$ is the same set of deal characteristics of deal j by firm i as in Equation (9). We include year fixed effects to control for the time trends in operating performance and cluster standard errors by firm. We predict β_3 to be negative. Note that there are six observations for each deal and that multiple mergers of a firm in a given year have different values of deal characteristic control variables, but share the same value of firm-year level variables including dependent variable.

Table 7 shows the results. In Panel A, we report time-series of the industry-adjusted operating performance of acquirer from fiscal years t-3 to t+3 for positive and negative return experience groups. The results show that operating performance deteriorates after acquisitions for both positive and negative return experience groups, but the drop is significantly larger for positive return experience group. The mean decline in three-year average industry-adjusted ROA is 1.56% for positive return experience group and 0.74% for negative return experience group. The panel also reveals better operating performance of the positive return experience group prior to the mergers but indifferent performance between positive and negative return experience group after the mergers, indicating that firms with positive return experiences suffer severer decline in operating performance.

Panel B of Table 7 presents the results of estimating Equation (10). Consistent with the univariate results, we find significantly negative coefficients on *Positive Return Experience Group X POST*, indicating that decline in performance is more pronounced if the deal is announced by positive return experience firms. After controlling for firm and deal characteristics, we still find that changes in operating performance after mergers are lower for positive return experience group than negative group by 0.65%.

4.3 The Role of Corporate Governance

In this section, we examine whether serial acquirers exhibit different behavior depending on the financial expertise on the acquirers' boards and institutional ownership of the acquirers. We add a dummy variable indicating well governed acquirers as well as the interaction terms between this dummy variable and past acquisition experiences in (8):

$$\begin{aligned} &Pr\{Y_{i,t}^{VD(VE)} = 1 | Past\ Acquisition\ Experiences_{i,t}, High_{i,t}, X_{i,t}\} \\ &= F(\beta_i + \beta_t + \beta_1 PPAE_{i,t} + \beta_2 NPAE_{i,t} + \beta_3 High_{i,t} \\ &\quad + \beta_4 PPAE_{i,t} \times High_{i,t} + \beta_5 NPAE_{i,t} \times High_{i,t} + X_{i,t}^{'} B) \end{aligned} \tag{11}$$

where $P(N)PAE_{i,j}$ refers to $Positive(Negative)\ Past\ Acquisition\ Experiences_{i,j}$, respectively, and $High_{i,t}$ is a dummy variable set to 1 if firm-year observations are in the highest tercile of institutional ownership (or financial expertise on corporate boards) for each year.

Table 8 presents evidence that firms with higher institutional ownership are less likely to engage in value-destroying deals after positive return experiences whereas firms with a higher fraction of financial experts on boards are more likely to initiate value enhancing acquisitions after negative return experiences. Hence, institutional ownership mitigates serial acquirers' excessive acquisitiveness following good experiences while financial expertise on boards helps identify value-enhancing deals after bad outcomes.

5 Direct and Indirect Channels for Acquisition Experiences: CEO Overconfidence

5.1 The Effect of Past Experiences on CEO Overconfidence

To tease out a direct effect of past acquisition experiences and an indirect effect of past acquisition experiences, possibly through CEO overconfidence, on acquisitiveness, we first test whether CEOs' overconfidence is formed by their past acquisition experiences using the CEO overconfidence measure used in Campbell et al. (2011) and Hirshleifer, Low, and Teoh (2012). Since we do not have detailed information on a CEO's stock option holdings, especially on remaining option duration, we have to rely only on option moneyness to determine CEO beliefs. As pointed out in Malmendier, Tate, and Yan (2011) and Hirshleifer, Low, and Teoh (2012), the options-based overconfidence measure relying only on the moneyness of options could proxy for the past stock return performance rather than for CEO overconfidence. Therefore, we control for buy-and-hold stock returns over the past fiscal year(s) as suggested in Malmendier, Tate, and Yan (2011) and Hirshleifer, Low, and Teoh (2012). Including the stock returns also controls for stock market driven takeovers (Shleifer and Vishny, 2003; Dong et al., 2006).

$$
\begin{aligned}
&Pr\{Overconfidence_{i,t} = 1 | Past\ Acquisition\ Experiences_{i,t}, Runup_{i,t}\} \qquad (12)\\
&= F(\beta_{ind} + \beta_t + \beta_1 Positive\ Past\ Acquisition\ Experiences_{i,t}\\
&\quad + \beta_2 Negative\ Past\ Acquisition\ Experiences_{i,t} + \beta_3 Runup_{i,t})
\end{aligned}
$$

where $O_{i,t}$ is a binary variable where 1 signifies overconfident CEO at firm i in year t, $Positive/Negative$ *Past Acquisition Experiences* are based on a transaction value weighted average of cumulative abnormal returns around the announcement date over the past 3, 5, and 10 years *within CEOs' tenure*, and $Runup_{i,t}$ is buy-and-hold stock returns over the lesser of the CEO's tenure or one year (or seven years). We use the Fama-French 48 industry classification for industry fixed effects, β_{ind}.

As shown in Panel A of Table 9, acquisition experiences within CEO's tenure make the CEO

become more overconfident. The results are robust to controlling for buy-and-hold stock returns over the past fiscal years as suggested in Malmendier, Tate, and Yan (2011) and Hirshleifer, Low, and Teoh (2012).

Interestingly, CEO overconfidence is only responsive to the *positive* return experiences in all specifications (Panel B of Table 9). This result is consistent with a self-serving bias of CEOs. That is, individuals tend to attribute their success to their own abilities and efforts, but ascribe their failure to external factors, not under their controls.

5.2 Horse Race: Past Experiences vs. CEO Overconfidence

Next we examine a direct effect of past acquisition experiences and an indirect effect of past acquisition experiences through CEO overconfidence on acquisition decisions using the following fixed effects logit regression:

$$
\begin{aligned}
&Pr\{Y_{i,t} = 1 | Past\ Acquisition\ Experiences_{i,t}, Overconfidence_{i,t}, Runup_{i,t}, X_{i,t}\} \qquad (13)\\
&= F(\beta_{ind} + \beta_t + \beta_1 Positive\ Past\ Acquisition\ Experiences_{i,t}\\
&\quad + \beta_2 Negative\ Past\ Acquisition\ Experiences_{i,t} + \beta_3 Overconfidence_{i,t} + \beta_4 Runup_{i,t} + X_{i,t}^{'} B)
\end{aligned}
$$

where $Y_{i,t}$ is a binary variable having the value 1 if the firm i announced at least one merger bid in year t that was eventually completed, $X_{i,t}$ is the same set of firm level controls, and all other variables are same as in (12).

Table 10 along with the results in Table 9 presents both direct and indirect effects of acquisition experiences on merger decision. Negative return experiences discourage firms from engaging in acquisitions in the following year whereas positive return experiences do not provoke more mergers in the subsequent year *in the presence of* CEO overconfidence. Consistent with Malmendier and Tate (2008), overconfidence significantly predicts firm's acquisitiveness. As shown in Table 9,

we can conclude that one of the mechanisms through which positive return experiences affect corporate merger decision is through CEO overconfidence whereas negative return experiences directly reduce acquisitiveness of firms.

5.3 Fairlie-Blinder-Oaxaca Decomposition

To compare the economic significance, we calculate the marginal effects of one standard deviation increase in negative acquisition experiences and overconfidence at their means[13]. One standard deviation increase in negative acquisition experiences reduces merger frequency by 2.64% whereas the same increase in overconfidence measure increases acquisitiveness by 2.05% in the specification (4). These marginal effects are economically meaningful in a sense that they are 8.83% and 6.56% of the average fitted probabilities at the means (29.91% and 31.25%) respectively. More importantly, the economic significance of negative return experiences is comparable to that of CEO overconfidence in Malmendier and Tate (2008).

Past acquisition experiences could drive not only CEO overconfidence measure but also other variables that affect corporate acquisition decisions such as cash flow, Q, size, and leverage. Therefore, there would be secondary channels through which past acquisition experiences affect merger decisions. To formally assess past acquisition experiences' influence on merger frequencies via secondary channels, we adopt the Fairlie-Blinder-Oaxaca decomposition method developed in Blinder (1973), Oaxaca (1973), and Fairlie (2005).

This method measures how much of the difference in High and Low Return Experience Groups' merger frequencies can be explained by differences in control variables such as cash flow, Q, size, and leverage, and most importantly CEO Overconfidence measure. We first run a logit regression of acquisition dummy on all control variables, omitting past acquisition experiences regressor. Us-

[13]Note that the average fitted probabilities and marginal effects are calculated from the *standard* logit regressions with year and industry dummy variables *only for* this purpose. We acknowledge possible incidental parameter problems in these specifications, but we confirm that the estimates from these specifications are very close to those from conditional logit regressions.

ing the decomposition technique, we then compute the marginal effect of group mean differences for seven collections of the control variables including year and industry dummies. For a given pairing across groups[14], marginal effects are the sequence of changes in predicted frequencies, obtained by sequentially changing each control variable′s value from its group mean at the Low- to its mean at the High- Return Experience Group. Sequencing of the changes in the control variables are randomized, repeated (1,000 times), and averaged to obtain marginal changes in merger frequencies and test statistics[15].

We obtain decomposition estimates for High Positive and Low Positive Return Experience Groups as well as for High Negative and Low Negative Return Experience Groups to gauge the magnitude of the secondary channel via CEO overconfidence across positive and negative return experiences.

Table 11 shows results from the Fairlie-Blinder-Oaxaca decomposition. Panel A presents decomposition estimates of High Positive and Low Positive Return Experience Groups. Total difference in merger frequencies between two groups is 2.07% of which only 0.88% can be explained by all variables. Note that significant portion, 20.15% (47.44%) of total difference (explained difference), is solely explained by overconfidence. This is consistent with our results in Table 10 that positive return experiences affect corporate acquisitiveness mostly through CEO overconfidence.

On the other hand, in the negative domain of return experiences, overconfidence does not contribute at all (-22.1% of contributions in Panel B of Table 11) to the total difference in merger frequencies between High Negative and Low Negative Return Experience Groups. In fact, the negative contribution of overconfidence implies that group difference in overconfidence goes in the opposite direction to the total difference in merger frequencies. This is again consistent with our previous results in Table 10 that negative return experiences directly curb firms' tendency to

[14]One-to-one matching of observations from the two groups is essential to calculate marginal effects. If the sample sizes of the two groups are different, we draw a random subsample of the large group equal in size to the small group to make one-to-one matching. See Fairlie, 2005 for detail.

[15]Marginal changes can be sensitive to the ordering of variables in the case of non-linear regression models such as logit or probit. See Fairlie, 2005 for detail.

involve acquisitions, but not through CEO overconfidence.

6 Conclusion

We show that serial acquirers over-extrapolate from their own past experiences while making future acquisition decisions: firms likely repeat (avoid) choices that have led to good (bad) outcomes from the past, even after controlling for aggregate time-series shocks, economic factors, rational learning about acquisition skill, and firm fixed effects. We also find that a firm experiencing high announcement returns in early acquisitions has a higher chance of becoming a serial acquirer. Moreover, serial acquirers with greater positive (negative) return experiences are more likely to initiate value-destroying (value-enhancing) mergers in terms of both market reaction and operating performance. This behavior is consistent with a reinforcement learning heuristic. We also discover that higher institutional ownership mitigates serial acquirers' excessive acquisitiveness following good experiences, whereas financial expertise on corporate boards helps identify value-enhancing deals after bad outcomes. Finally, CEO overconfidence increases after past firm successes, but remains immune to failures. Hence, past successes provoke future mergers by making managers more overconfident whereas negative experiences directly curb serial acquirers' acquisitiveness.

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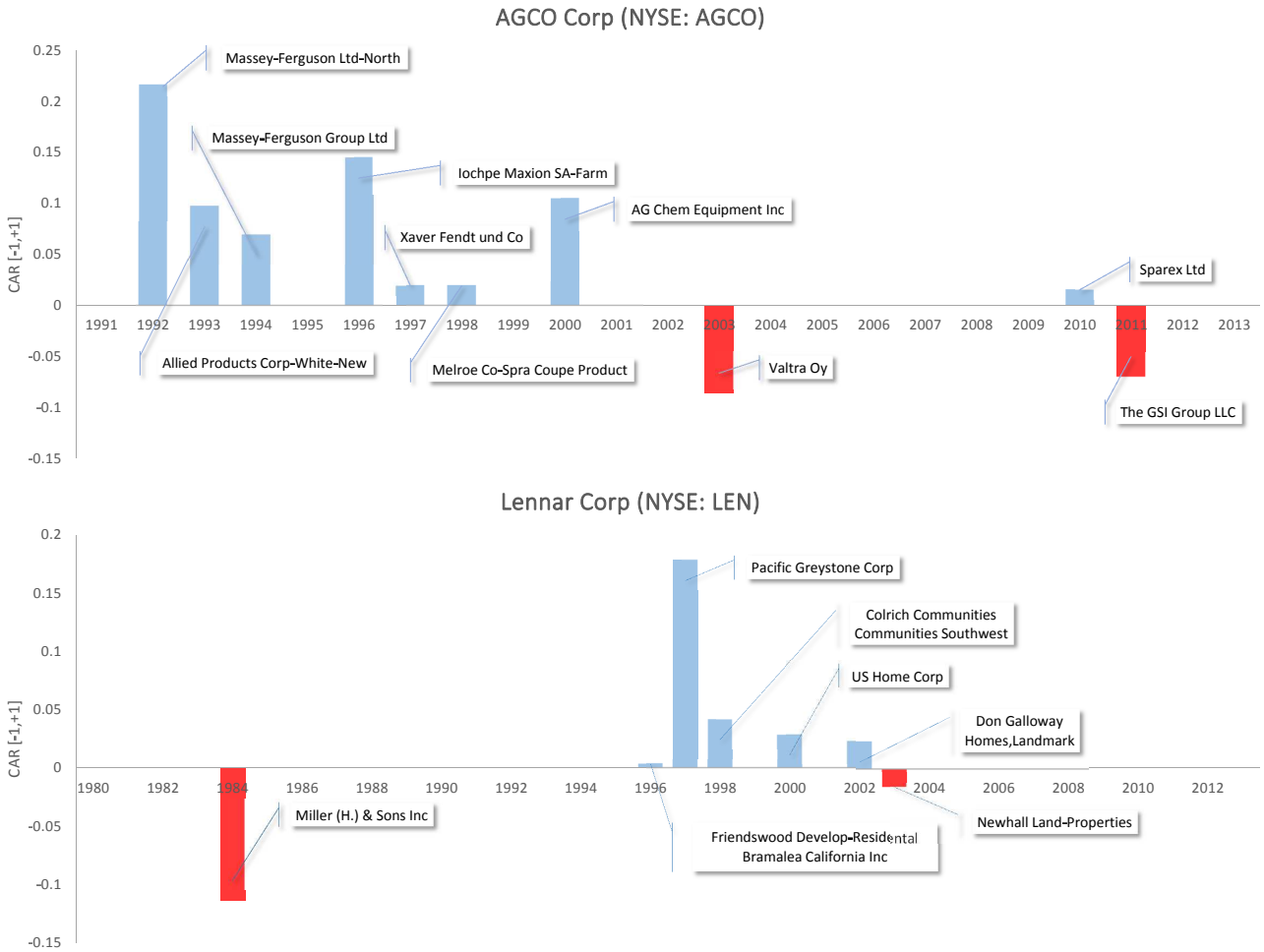
Figure 1. Anecdotes of Reinforcement Learning Behavior in Acquisition Decisions: AGCO Corp & Lennar Corp



The figures depict histories of merger announcements of two example firms in the Fortune 500 companies: AGCO Corp and Lennar Corp. *CAR[-1,+1]* is the equally weighted average of announcement returns given a fiscal year. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. Each text box linked to bars indicates the names of target firms. AGCO Corporation manufactures and distributes agricultural equipment, like grain storage and tractors, and replacement parts. Lennar Corporation is a national homebuilder with operations in 40 markets in 17 states in the United States.

Table 1. Descriptive Statistics

Panel A presents descriptive statistics of *Past Acquisition Experiences*. We define it as transaction value weighted average of announcement returns during the past 10 years. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We separately display distributions of *Past Acquisition Experiences* by positive and negative ones. Panel B shows mean differences of firm-level variables across positive and negative return experience groups. Positive (Negative) Return Experience group has positive (negative) *Past Acquisition Experiences* over the past 10 years. *Freq of Acquisitions* represents the frequency of participating in acquisitions that are eventually completed, *Cashflow* is earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* is the ratio of market value of assets to book value of assets at the beginning of the year, *ln (Total Assets [$m])* is the log of total assets at the beginning of the year, *Leverage* is total debt over total assets at the beginning of the year, and *CEO Overconfidence* is a binary variable where 1 signifies overconfident CEO following Campbell et al., 2011. Panel C presents mean differences of deal-level variables across positive and negative return experience groups. *RAW[-1,+1]* is the cumulative raw return of the acquirer's stock over a three-day window starting one day before the announcement, and *CAR[-1,+1]* is the cumulative abnormal return of the acquiring firm's stock over the same window using the difference between raw returns and value-weighted market index returns. *Relative Size* is the deal value divided by the market value of the bidding firm's equity 11 days prior to the announcement date, *Relatedness* indicator variable set to one if the acquirer and target are operating in the same industries with a common two-digit Standard Industrial Classification code and zero otherwise, *Friendly* a binary variable with a value of 1 if the bid is reported as friendly, *Public, Private, Subsidiary* a indicator variable having 1 if the bid is for a public, private, and subsidiary target, and *Cash (Stock)* a binary variable where 1 indicates that the acquisition was financed by 100% of cash (stock). ***, **, * indicate a difference that is significant at the 1%, 5%, and 10% levels, respectively. The sample period runs from 1983 to 2013.

Panel A: Distributions of *Past Acquisition Experiences*

Variables	Mean	10th pct	25th pct	Median	75th pct	90th pct	Std.Dev.	Num.Obs.
Past 10yr Acquisition Exp	0.011	-0.055	-0.020	0.006	0.036	0.083	0.064	39,862
Positive Exp	0.049	0.005	0.013	0.031	0.064	0.115	0.053	22,541
Negative Exp	-0.038	-0.089	-0.052	-0.025	-0.011	-0.004	0.040	17,321

Panel B: Firm-Year Level Variables by Positive and Negative Return Experiences

Variables	Mean		Mean Differences	Num.Obs.	
	Positive Return Exp	Negative Return Exp	Positive - Negative	Positive Return Exp	Negative Return Exp
Freq of Acquisitions	0.204	0.192	0.012***	22,541	17,321
Cash Flow	0.412	0.330	0.082**	22,330	17,178
Q	1.740	1.790	-0.050***	21,368	15,820
ln (Total Assets [$m])	6.560	6.940	-0.380***	22,484	17,283
Leverage	0.249	0.227	0.022***	22,397	17,211
CEO Overconfidence	0.370	0.329	0.041***	5,342	4,372

Panel C: Deal Level Variables by Positive and Negative Return Experiences

Variables	Mean		Mean Differences
	Positive Return Exp	Negative Return Exp	Positive - Negative
RAW $[-1,+1]$	0.014	0.007	0.007***
CAR $[-1,+1]$	0.012	0.006	0.006***
Relativesize	0.192	0.166	0.026***
Relatedness	0.638	0.639	-0.001
Friendly	0.994	0.995	-0.001
Public	0.142	0.218	-0.076***
Private	0.496	0.475	0.021**
Subsidiary	0.362	0.307	0.055***
Cash	0.295	0.266	0.029***
Stock	0.152	0.219	-0.067***
Num.Obs.	6,460	4,524	

Table 2. Reinforcement Learning Behavior: Do Past Acquisition Return Experiences Provoke More Mergers?

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (4). The dependent variable is a binary variable where 1 indicates that the firm made at least one merger bid in a given year. Our main variable is *Past Acquisition Experiences* over the past 3, 5, and 10 year windows. In Panel A (B), we define *Past Acquisition Experiences* as transaction value weighted (equally weighted) average of announcement returns during the corresponding experience windows. Announcement returns are raw (or abnormal) returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. In panel C, we use *Success Ratio*, a ratio of number of successful deals to total number of deals during the corresponding experience windows where we define successful deals as ones with positive raw (or abnormal) returns. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. Note that the marginal effects shown in Panel A are calculated from the linear probability models with year and firm dummy variables *only for* this purpose. *Unconditional mean of dependent variable* is also based on the sample used in the linear probability models. The sample period runs from 1983 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by firm. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Transaction Value Weighted Return

	Predicting Acquirer (Acquirer = 1)					
	Value Weighted Raw Return			Value Weighted Abnormal Return		
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Past Acquisition Experiences	.9149**	.8654**	.9818**	.9966**	1.0355**	1.1216**
	(.3822)	(.4089)	(.4495)	(.3965)	(.4245)	(.4626)
CashFlow	.0173**	.0219***	.0233***	.0173**	.0219***	.0233***
	(.0085)	(.0077)	(.0074)	(.0085)	(.0077)	(.0074)
Q	.1035***	.0949***	.0872***	.1030***	.0943***	.0867***
	(.0236)	(.0215)	(.0196)	(.0235)	(.0215)	(.0196)
Size	-.3014***	-.2397***	-.1764***	-.3021***	-.2408***	-.1774***
	(.0485)	(.0440)	(.0410)	(.0484)	(.0440)	(.0410)
Leverage	-2.6054***	-2.5664***	-2.5715***	-2.6060***	-2.5683***	-2.5735***
	(.2180)	(.1939)	(.1806)	(.2178)	(.1937)	(.1806)
Marginal effects(%) due to 1σ increase of						
Past Acquisition Experiences	1.18%	1.08%	1.13%	1.23%	1.24%	1.25%
CashFlow	0.95%	1.07%	0.83%	0.95%	1.07%	0.83%
Q	2.83%	2.45%	2.20%	2.82%	2.43%	2.19%
Unconditional mean of dependent variable	23.92%	21.68%	19.62%	23.92%	21.68%	19.62%
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	15,822	20,918	26,349	15,822	20,918	26,349
Pseudo R^2	.0455	.0416	.0378	.0456	.0417	.0379

Panel B: Equally Weighted Return

	Predicting Acquirer (Acquirer = 1)					
	Equally Weighted Raw Return			Equally Weighted Abnormal Return		
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Past Acquisition Experiences	.9653**	1.1420**	1.3818**	1.0653**	1.3100***	1.5433***
	(.4220)	(.4643)	(.5585)	(.4386)	(.4820)	(.5739)
CashFlow	.0176**	.0220***	.0233***	.0176**	.0219***	.0233***
	(.0085)	(.0077)	(.0073)	(.0085)	(.0077)	(.0073)
Q	.1035***	.0948***	.0869***	.1030***	.0941***	.0864***
	(.0235)	(.0214)	(.0196)	(.0235)	(.0214)	(.0196)
Size	-.3016***	-.2394***	-.1766***	-.3022***	-.2404***	-.1777***
	(.0484)	(.0440)	(.0410)	(.0484)	(.0440)	(.0410)
Leverage	-2.6029***	-2.5689***	-2.5737***	-2.6039***	-2.5708***	-2.5754***
	(.2181)	(.1941)	(.1808)	(.2179)	(.1940)	(.1808)
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	15,822	20,918	26,349	15,822	20,918	26,349
Pseudo R^2	.0455	.0417	.0379	.0456	.0418	.0380

Panel C: Success Ratio

	Predicting Acquirer (Acquirer = 1)					
	Success Ratio based on Raw Return			Success Ratio based on Abnormal Return		
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Past Acquisition Experiences	.1181**	.1535**	.2107***	.1280**	.1659***	.2023***
	(.0600)	(.0646)	(.0810)	(.0574)	(.0625)	(.0784)
CashFlow	.0175**	.0219***	.0231***	.0176**	.0220***	.0233***
	(.0085)	(.0077)	(.0074)	(.0085)	(.0077)	(.0074)
Q	.1052***	.0958***	.0876***	.1046***	.0952***	.0873***
	(.0236)	(.0214)	(.0195)	(.0236)	(.0214)	(.0195)
Size	-.3014***	-.2388***	-.1762***	-.3023***	-.2401***	-.1772***
	(.0484)	(.0439)	(.0409)	(.0484)	(.0439)	(.0410)
Leverage	-2.5835***	-2.5531***	-2.5658***	-2.5830***	-2.5553***	-2.5679***
	(.2179)	(.1935)	(.1800)	(.2179)	(.1935)	(.1801)
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	15,822	20,918	26,349	15,822	20,918	26,349
Pseudo R^2	.0454	.0416	.0380	.0455	.0417	.0380

Table 3. Reinforcement Learning Behavior: Specific Deal Strategy Level

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (5). The dependent variable is a binary variable where 1 indicates that the firm made at least one merger bid of which target is type θ in a given year, where $\theta \in \{public,\ private\}$ or $\{within\ industry,\ across\ industry\}$. We define *Past Acquisition Experiences in Type* γ *Target* as transaction value weighted average of announcement returns of merger bids for type γ target during the past 10 years where $\gamma \in \{public,\ private\}$ or $\{within\ industry, across\ industry\}$. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We include the following control variables: *Cashflow*, *Q*, *Leverage*, *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. We use the Standard Industrial Classification (SIC) for industry fixed effects. The sample period runs from 1983 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by industry. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Public vs. Private Targets

	Predicting Acquirer (Acquirer of Type θ Target = 1)			
	θ = Public		θ = Private	
	γ = Public	γ = Private	γ = Private	γ = Public
	(1)	(2)	(3)	(4)
Past Acquisition Experiences in Type γ *Target*	1.3697**	.8581	1.1161***	-.1684
	(.6376)	(.8875)	(.4009)	(.5895)
Controls	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes
Industry-Fixed Effects	Yes	Yes	Yes	Yes
# Obs.	7,095	18,247	22,604	7,983
Pseudo R^2	.0518	.0781	.0298	.0209

Panel B: Within vs. Across Industry Targets

	Predicting Acquirer (Acquirer of Type θ Target = 1)			
	θ = Within		θ = Across	
	γ = Within	γ = Across	γ = Across	γ = Within
	(1)	(2)	(3)	(4)
Past Acquisition Experiences in Type γ *Target*	1.5252***	.8610*	.6167	.1358
	(.3122)	(.4926)	(.4473)	(.3916)
Controls	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes
Industry-Fixed Effects	Yes	Yes	Yes	Yes
# Obs.	25,715	18,517	18,866	24,986
Pseudo R^2	.0256	.0268	.0279	.0279

Table 4. Do Past Acquisition Return Experiences Provoke More Mergers? - Differential Effects of Positive and Negative Experiences

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (6). The dependent variable is a binary variable where 1 indicates that the firm made at least one merger bid in a given year. Our main variable is *Positive* (*Negative*) *Past Acquisition Experiences* over the past 3, 5, and 10 year windows. We define *Past Acquisition Experiences* as transaction value weighted average of announcement returns during the corresponding experience windows. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We separate *Past Acquisition Experiences* into two parts: *Positive Past Acquisition Experiences* = *Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences \geq 0\}}$ and *Negative Past Acquisition Experiences* = $-$*Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences < 0\}}$. We include the following control variables: *Cashflow*, *Q*, *Leverage*, *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. The sample period runs from 1983 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by firm. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Predicting Acquirer (Acquirer = 1)		
	Past Acquisition Experience Windows		
	3yr	5yr	10yr
	(1)	(2)	(3)
Positive Past Acquisition Experiences	.4147	1.1072*	1.7655***
	(.5656)	(.6072)	(.6723)
Negative Past Acquisition Experiences	-1.9919**	-.9126	-.0130
	(.8428)	(.8392)	(.9099)
Controls	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes
# Obs.	15,822	20,918	26,349
Pseudo R^2	.0458	.0417	.0380

Table 5. Becoming Serial Acquirer and Past Acquisition Return Experiences

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (7). The dependent variable is a binary variable where 1 indicates that the firm is a serial acquirer. We define serial acquirers as those with more than one *year* of merger activity over the sample period. Our main variable is $Value\ Weighted\ CARs$, transaction value weighted announcement returns during the first fiscal year when the firm announces at least one acquisition. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We include the following firm level control variables corresponding to the same first year: *Cashflow*, *Q*, *Leverage*, *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. In Column (2), we use alternative definition of serial acquirers: firms acquired more than five targets over the sample period. Correspondingly, we calculate $Value\ Weighted\ CARs$ using up to *first* five merger announcements over the sample period and we use control variables corresponding to the most recent merger announcement which is used in calculating $Value\ Weighted\ CARs$. We use the Standard Industrial Classification (SIC) for industry fixed effects. Note that the marginal effects shown in this table are calculated from the *standard* logit regressions with year and industry dummy variables *only for* this purpose. The sample period runs from 1983 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by industries. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Predicting Serial Acquirer (Serial Acquirer = 1)	
		Alternative Definition of Serial Acquirer
	(1)	(2)
$Value\ Weithged\ CARs$	.7246*	1.1004*
	(.4168)	(.5629)
$CashFlow$	.0422***	.0887***
	(.0081)	(.0129)
Q	.0357**	.0080
	(.0154)	(.0246)
$Size$	.2801***	.5021***
	(.0336)	(.0556)
$Leverage$	-.0777	.4008
	(.2230)	(.3925)
Marginal effects(%) of 1σ increase from the mean of $Value\ Weithged\ CARs$	1.23%	0.95%
Unconditional mean of dependent variable	54.00%	16.67%
Year-Fixed Effects	Yes	Yes
Industry-Fixed Effects	Yes	Yes
# Obs.	4,101	3,893
Pseudo R^2	.0867	.1687

Table 6. Do Past Acquisition Return Experiences Provoke More Value Destroying or Enhancing Mergers?

Panel A presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (8). The dependent variable is a binary variable where 1 indicates that the firm engages in *Value Destroying(VD)* (or *Value Enhancing(VE)*) mergers in a given year. We use a sign of transaction value weighted average of abnormal returns in a given year to define *Value Destroying* and *Value Enhancing* mergers. If the sign is negative (positive), a firm is classified as engaging in *Value Destroying* (*Value Enhancing*) mergers. Our main variable is *Positive* (*Negative*) *Past Acquisition Experiences* over the past 3, 5, and 10 year windows. We define *Past Acquisition Experiences* as transaction value weighted average of announcement returns during the corresponding experience windows. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We separate *Past Acquisition Experiences* into two parts: *Positive Past Acquisition Experiences* = *Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences \geq 0\}}$ and *Negative Past Acquisition Experiences* = $-$*Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences < 0\}}$. We include the following control variables: *Cashflow*, *Q*, *Leverage*, *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. Panel B reports results from fixed effects OLS regression in Equation (9). Dependent variable is a cumulative abnormal return on the bidder's stock over a three-day window starting one day before the announcement date. We use the same set of firm level control variables as in Panel A. We also include the following deal level control variables: *Relative Size* is the deal value divided by the market value of the bidding firm's equity 11 days prior to the announcement date, *Relatedness* indicator variable set to one if the acquirer and target are operating in the same industries with a common two-digit Standard Industrial Classification (SIC) code and zero otherwise, *Friendly* a binary variable with a value of 1 if the bid is reported as friendly, *Public (omitted), Private, Subsidiary* a indicator variable having 1 if the bid is for a public, private, and subsidiary target, and *Cash (Stock)* a binary variable where 1 indicates that the acquisition was financed by 100% of cash (stock). The sample period runs from 1983 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by firm. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Predicting Value Destroying or Value Enhancing Acquirer

	Predicting Value Destroying [Value Enhancing] Acquirer (VD [VE] Acquirer = 1)					
	Past Acquisition Experience Windows					
	3yr		5yr		10yr	
	VD	VE	VD	VE	VD	VE
	(1)	(2)	(3)	(4)	(5)	(6)
Positive Past Acquisition Experiences	4.1711***	-2.4318***	4.9158***	-1.7395**	7.7343***	-2.3440***
	(.8075)	(.7331)	(.9010)	(.7521)	(1.1594)	(.7832)
Negative Past Acquisition Experiences	-8.0297***	4.7756***	-8.8492***	7.2040***	-10.0798***	10.4000***
	(1.2485)	(1.0488)	(1.2087)	(1.1201)	(1.3475)	(1.3221)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm-Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	11,773	12,604	15,687	16,804	19,566	21,668
Pseudo R^2	.0411	.0458	.0403	.0421	.0422	.0407

Panel B: Market Response

	CAR [-1,+1]		
	Past Acquisition Experience Windows		
	3yr	5yr	10yr
	(1)	(2)	(3)
Positive Past Acquisition Experiences	-.2161***	-.2512***	-.3118***
	(.0354)	(.0360)	(.0365)
Negative Past Acquisition Experiences	.3620***	.4285***	.5027***
	(.0601)	(.0513)	(.0583)
CashFlow	.0016**	.0016***	.0015***
	(.0007)	(.0006)	(.0005)
Q	-.0009	-.0007	-.0006
	(.0007)	(.0006)	(.0006)
Size	-.0102***	-.0086***	-.0085***
	(.0025)	(.0023)	(.0022)
Leverage	.0070	.0032	.0090
	(.0136)	(.0118)	(.0107)
Relative Size	.0095*	.0096**	.0084**
	(.0050)	(.0045)	(.0035)
Relatedness	-.0005	-.0008	-.0010
	(.0022)	(.0020)	(.0019)
Friendly	-.0152	-.0058	.0042
	(.0141)	(.0110)	(.0096)
Private	.0105***	.0109***	.0094***
	(.0038)	(.0035)	(.0032)
Subsidiary	.0147***	.0147***	.0139***
	(.0040)	(.0036)	(.0032)
Cash	.0057***	.0051***	.0048***
	(.0021)	(.0019)	(.0018)
Stock	-.0080	-.0075*	-.0064
	(.0049)	(.0045)	(.0041)
Private × *Stock*	.0229***	.0228***	.0217***
	(.0062)	(.0058)	(.0053)
Marginal effects(%) due to 1σ increase of			
Positive Past Acquisition Experiences	-1.10%***	-1.28%***	-1.59%***
	(.0018)	(.0018)	(.0019)
Negative Past Acquisition Experiences	1.27%***	1.50%***	1.85%***
	(.0021)	(.0018)	(.0021)
Year- and Firm-Fixed Effects	Yes	Yes	Yes
# Obs.	7,910	8,921	9,765
Adjusted R^2	.0610	.0720	.0804

Table 7. Operating Performance

Panel A reports the time-series of industry adjusted operating performance of acquirer from fiscal years t-3 to t+3 where t indicates merger completion year. Operating performance is calculated as return on assets (ROA), defined as EBITDA normalized by average total assets with goodwill adjustment. Positive (Negative) Return Experience group has positive (negative) transaction value weighted average of abnormal returns over the past 10 years. Panel B presents results from fixed effects OLS regression in Equation (10). As suggested in Gormley and Matsa, 2014, we use industry fixed effects with dependent variable being ROA of acquirer from fiscal years t-3 to t+3 excluding t. Our variable of interest is *Positive Return Experience Group* × *POST*, an interaction term of *Positive Return Experience Group* and *POST*. *Positive Return Experience Group* is a binary variable where 1 indicates *High Return Experience* group and 0 otherwise. *POST* is a binary variable where 1 indicates post merger periods and 0 otherwise. Firm level control variables include *Cashflow*, *Q*, *Leverage*, and *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. Deal characteristic variables are *Relative Size*, *Relatedness*, *Friendly*, *Public (omitted), Private, Subsidiary*, *Cash (Stock)*, and *Private* × *Stock*. *Relative Size* is the deal value divided by the market value of the bidding firm's equity 11 days prior to the announcement date, *Relatedness* indicator variable set to one if the acquirer and target are operating in the same industries with a common two-digit Standard Industrial Classification (SIC) code and zero otherwise, *Friendly* a binary variable with a value of 1 if the bid is reported as friendly, *Public (omitted), Private, Subsidiary* a indicator variable having 1 if the bid is for a public, private, and subsidiary target, and *Cash (Stock)* a binary variable where 1 indicates that the acquisition was financed by 100% of cash (stock). The sample period runs from 1983 to 2013. We use the Fama-French 48 industry classification both for industry adjusted operating performance and industry fixed effects. Standard errors in parentheses are robust to heteroskedasticity and clustered by firm. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Industry Adjusted Operating Performance of Mergers

	Positive Return Experience (1)	Negative Return Experience (2)	Positive - Negative (3)
t-3	7.91%	6.95%	0.97%***
t-2	8.22%	7.30%	0.92%***
t-1	8.74%	7.62%	1.13%***
Pre-merger mean performance [A]	8.28%	7.28%	1.01%***
t (merger completion year)	8.31%	7.27%	1.04%***
t+1	7.39%	6.81%	0.58%*
t+2	6.55%	6.46%	0.09%
t+3	6.19%	6.29%	-0.10%
Post-merger mean performance [B]	6.72%	6.54%	0.19%
Post - Pre [B - A]	-1.56%***	-0.74%***	-0.82%***

Panel B: Operating Performance Regressions

	Return on Assets		
	(1)	(2)	(3)
Positive Return Experience Group	.0110*** (.0034)	.0107*** (.0034)	.0112*** (.0029)
POST	-.0035 (.0023)	-.0028 (.0023)	-.0033 (.0021)
Positive Return Experience Group × *POST*	-.0082*** (.0030)	-.0073** (.0030)	-.0065** (.0026)
Controls	No	No	Yes
Year-Fixed Effects	No	Yes	Yes
Industry-Fixed Effects	Yes	Yes	Yes
# Obs.	57,366	57,366	49,630
Adjusted R^2	.1516	.1617	.3413

Table 8. Past Acquisition Return Experiences and Value Destroying or Enhancing Mergers - Corporate Governance

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (11) to examine differential effects of past acquisition return experiences on merger frequencies across corporate governance proxies. We use institutional ownership and financial expertise on corporate boards of *acquirers* as proxies for corporate governance. Institutional ownership data comes from the Thomson Reuters Institutional (13F) Holdings database, which contains ownership information by institutional managers as reported on the Form 13F filed with the SEC. We measure institutional ownership as the number of shares held by institutional investors divided by total number of shares outstanding at the end of fiscal year t-1. Financial expertise on corporate boards data is from the RiskMetrics. We measure financial expertise on corporate boards as the number of financial experts (as indicated by RiskMetrics) designated on the board of directors divided by total number of board members in fiscal year t-1. For each year, firm-year observations in the highest tercile of institutional ownership (financial expertise) are classified as high institutional ownership (financial expertise): *High*=1. The dependent variable is a binary variable where 1 indicates that the firm engages in *Value Destroying(VD)* (or *Value Enhancing(VE)*) mergers in a given year. We use a sign of transaction value weighted average of abnormal returns in a given year to define *Value Destroying* and *Value Enhancing* mergers. If the sign is negative (positive), a firm is classified as engaging in *Value Destroying* (*Value Enhancing*) mergers. We define *Past Acquisition Experiences* as transaction value weighted average of announcement returns over the past 10 years. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns. We separate *Past Acquisition Experiences* into two parts: *Positive Past Acquisition Experiences* $=$ *Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences \geq 0\}}$ and *Negative Past Acquisition Experiences* $= -$*Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences < 0\}}$. We include the following control variables: *Cashflow*, *Q*, *Leverage*, *Size*. We measure *Cashflow* as earnings before extraordinary items plus depreciation normalized by the beginning-of-the-year capital (property, plants, and equipment), *Q* as the ratio of market value of assets to book value of assets at the beginning of the year, *Leverage* as total debt over total assets at the beginning of the year, and *Size* as the log of total assets at the beginning of the year. The sample period runs from 1983 to 2013 for column (1)-(2) and from 2008 to 2013 for column (3)-(4). Standard errors in parentheses are robust to heteroskedasticity and clustered by firm. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Value Destroying [Value Enhancing] Acquirer = 1			
	Institutional Ownership		Financial Expertise	
	VD	VE	VD	VE
	(1)	(2)	(3)	(4)
Positive Past Acquisition Experiences [*PPAE*]	8.8184***	-2.4337***	14.8153**	-6.4598
	(1.3953)	(.9015)	(6.5839)	(5.9390)
Negative Past Acquisition Experiences [*NPAE*]	-9.7794***	11.6190***	-14.3734**	11.4813**
	(1.7836)	(1.4985)	(6.2306)	(5.4227)
High	.3127***	.2364***	-.2275	.2689
	(.0937)	(.0831)	(.2910)	(.2813)
PPAE $\times$ *High*	-3.1406**	.5193	-.1826	-4.3472
	(1.5244)	(1.2117)	(4.6944)	(6.8579)
NPAE $\times$ *High*	-.5291	-2.5242	1.9171	14.3706*
	(2.1378)	(1.7469)	(7.7226)	(7.8923)
Controls/Year and Firm-Fixed Effects	Yes	Yes	Yes	Yes
# Obs.	18,769	20,900	1,356	1,742
Pseudo R^2	.0427	.0398	.0487	.0679

Table 9. The Effect of Past Acquisition Experiences on CEO Overconfidence

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (4). The dependent variable is a binary variable where 1 signifies overconfident CEO following Campbell et al., 2011. Our main variables are *Past Acquisition Experiences*, *Positive Past Acquisition Experiences*, and *Negative Past Acquisition Experiences* over the past 3, 5, and 10 year windows *within CEOs' tenure*. We define *Past Acquisition Experiences* as transaction value weighted average of announcement returns during the corresponding experience windows. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns for the same period. We control for buy-and-hold stock returns over the past fiscal year as suggested in Malmendier, Tate, and Yan, 2011 and Hirshleifer, Low, and Teoh, 2012. *Runup* $1(7)yr$ is buy-and-hold stock returns over the lesser of the CEO's tenure or one year (seven years). We use the Fama-French 48 industry classification for industry fixed effects. The sample period runs from 1992 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by industry. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Past Abnormal Returns

	Predicting Overconfidence (Overconfident CEO = 1)					
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Past Acquisition Experiences	1.9220***	1.9792***	1.9637***	1.3255**	1.1556**	1.1470*
	(.5306)	(.5251)	(.6278)	(.5364)	(.5145)	(.6277)
Runup $1yr$	.6976***	.6768***	.6607***			
	(.0701)	(.0689)	(.0625)			
Runup $7yr$				.8565***	.8708***	.8566***
				(.0609)	(.0609)	(.0621)
Year- and Industry- Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	5,131	6,075	6,821	5,131	6,075	6,821
Pseudo R^2	.0597	.0581	.0519	.0965	.096	.0893

Panel B: Positive vs. Negative Past Abnormal Returns

	Predicting Overconfidence (Overconfident CEO = 1)					
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Positive Past Acquisition Experiences	3.4148***	3.6702***	3.0399***	2.4547**	2.4645***	1.8982*
	(.9632)	(.8623)	(.9659)	(1.0587)	(.9175)	(1.0680)
Negative Past Acquisition Experiences	.0878	.2856	-.4835	.2012	.5977	-.1189
	(1.0261)	(1.0293)	(1.1775)	(1.1124)	(1.0851)	(1.2514)
Runup $1yr$	.6985***	.6790***	.6609***			
	(.0696)	(.0680)	(.0622)			
Runup $7yr$				.8540***	.8681***	.8551***
				(.0612)	(.0617)	(.0624)
Year- and Industry- Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	5,131	6,075	6,821	5,131	6,075	6,821
Pseudo R^2	.0605	.0591	.0523	.0969	.0966	.0895

Table 10. CEO Overconfidence vs. Past Acquisition Experiences in Predicting Acquirer

This table presents results from the fixed effects logit regressions that are estimated using a conditional logit specification in Equation (4). The dependent variable is a binary variable where 1 indicates that the firm made at least one merger bid in a given year. Our main variable is *Positive* (*Negative*) *Past Acquisition Experiences* over the past 3, 5, and 10 year windows and $Overconfidence$. We define *Past Acquisition Experiences* as transaction value weighted average of announcement returns during the corresponding experience windows. Announcement returns are abnormal returns over a three-day window starting one day before the announcement date where abnormal returns are the difference between raw returns and value-weighted market index returns for the same period. We separate *Past Acquisition Experiences* into two parts: *Positive Past Acquisition Experiences* = *Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences \geq 0\}}$ and *Negative Past Acquisition Experiences* = $-$*Past Acquisition Experiences* $\times \mathbb{1}_{\{Past\ Acquisition\ Experiences < 0\}}$. $Overconfidence$ is a binary variable where 1 signifies overconfident CEO following Campbell et al., 2011. We use the Fama-French 48 industry classification for industry fixed effects. The sample period runs from 1992 to 2013. Standard errors in parentheses are robust to heteroskedasticity and clustered by industry. Note that the average fitted probabilities and marginal effects shown in this table are calculated from the *standard* logit regressions with year and industry dummy variables *only for* this purpose. We acknowledge possible incidental parameter problems in these specifications, but we confirm that the estimates from these specifications are very close to those from conditional logit regressions. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

	Predicting Acquirer (Acquirer = 1)					
	Experience Windows			Experience Windows		
	3yr	5yr	10yr	3yr	5yr	10yr
	(1)	(2)	(3)	(4)	(5)	(6)
Positive Past Acquisition Experiences	-1.1193	.0450	-.1394	-1.2978	-.1555	-.3613
	(.7963)	(.9291)	(.9178)	(.8037)	(.9665)	(.9534)
Negative Past Acquisition Experiences	-3.2655***	-2.4318**	-2.4661**	-3.2491***	-2.4206**	-2.4514**
	(1.0783)	(.9657)	(.9737)	(1.0742)	(.9791)	(.9920)
$Overconfidence$	.2441***	.2506***	.2279***	.2005***	.2107***	.1882***
	(.0701)	(.0632)	(.0594)	(.0673)	(.0623)	(.0597)
Runup 1yr	.2407***	.1916***	.1706***			
	(.0636)	(.0547)	(.0475)			
Runup 7yr				.2229***	.2009***	.1936***
				(.0453)	(.0462)	(.0449)
Avg. fitted prob.(%) at the mean of						
Negative Past Acquisition Experiences	29.90%	27.77%	25.07%	29.91%	27.78%	25.08%
$Overconfidence$	31.23%	28.68%	25.92%	31.25%	28.69%	25.94%
Marginal effects(%) of 1σ increase from the mean of						
Negative Past Acquisition Experiences	-2.66%***	-1.87%***	-1.77%***	-2.64%***	-1.86%***	-1.76%***
	(.0083)	(.0071)	(.0066)	(.0082)	(.0072)	(.0068)
$Overconfidence$	2.51%***	2.46%***	2.08%***	2.05%***	2.05%***	1.71%***
	(.0073)	(.0063)	(.0055)	(.0070)	(.0062)	(.0055)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year- and Industry- Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
# Obs.	5,318	6,742	8,422	5,318	6,742	8,422
Pseudo R^2	.0168	.0150	.0129	.0186	.0166	.0145

Table 11. Fairlie-Blinder-Oaxaca Decomposition of the Secondary Effects of Past Acquisition Experiences on Merger Decision

This table presents results from the Fairlie-Blinder-Oaxaca decomposition. This method measures how much of the difference in High and Low Return Experience Groups' merger frequencies can be explained by differences in control variables such as *Cashflow*, *Q*, *Leverage*, *Size*, and most importantly *CEO Overconfidence*. We first run a logit regression of *Acquirer* dummy on all control variables, omitting *Past Acquisition Experiences* regressor. The decomposition technique computes the marginal effect of group mean differences for seven natural collections of the control variables including year and industry dummies. For a given pairing across groups, marginal effects are the sequence of changes in predicted frequencies obtained by sequentially changing each control variable′s value from its group mean at the Low- to its mean at the High- Return Experience Group. Sequencing of the changes in the control variables are randomized, repeated (1,000 times), and averaged to obtain marginal changes in merger frequencies and test statistics. Panel A reports decomposition estimates for High Positive vs. Low Positive Return Experience Groups where as Panel B reports those for High Negative vs. Low Negative Return Experience Groups. ***, **, * indicate significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Decomposition Estimates of High Positive vs Low Positive Return Experience Groups

Variables	Decomposition(%) [A]	z-value	Contributions [A / B]
CEO Overconfidence	0.417%***	3.200	20.15%
Cash Flow	0.115%	1.230	5.53%
Q	-0.070%	-0.590	-3.39%
Size	0.660%*	1.900	31.83%
Leverage	0.052%	1.040	2.49%
Year Dummies	0.003%	0.030	0.16%
Industry Dummies	-0.298%	-0.780	-14.36%
High Positive Return Exp Group M&A Frequencies	30.537%		
Low Positive Return Exp Group M&A Frequencies	28.465%		
Total Difference in M&A Frequencies [B]	2.072%		
Explained Difference in M&A Frequencies	0.879%		
Unexplained Difference in M&A Frequencies	1.194%		

Panel B: Decomposition Estimates of High Negative vs Low Negative Return Experience Groups

Variables	Decomposition(%) [A]	z-value	Contributions [A / B]
CEO Overconfidence	0.294%***	2.760	-22.12%
Cash Flow	-0.018%	-0.240	1.33%
Q	0.054%	0.340	-4.06%
Size	0.089%	0.750	-6.70%
Leverage	0.058%	0.460	-4.35%
Year Dummies	-0.008%	-0.060	0.61%
Industry Dummies	0.275%	0.600	-20.70%
High Negative Return Exp Group M&A Frequencies	26.166%		
Low Negative Return Exp Group M&A Frequencies	27.494%		
Total Difference in M&A Frequencies [B]	-1.328%		
Explained Difference in M&A Frequencies	0.744%		
Unexplained Difference in M&A Frequencies	-2.072%		