THE IMPACT OF PRIOR STOCK MARKET REACTIONS ON RISK TAKING IN ACQUISITIONS

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We study the relationship between the stock market’s reaction to a prior acquisition and the risk associated with a subsequent acquisition. Using a sample of 823 acquisitions over the period 1990–2006 we find that acquirers buy increasingly volatile targets both as the abnormal dollar gains from the previous acquisition announcement increase, and as the abnormal dollar losses increase (i.e. a V shaped relationship). Our findings are consistent with psychological theories of decision making and risk seeking, including prospect theory and the house money effect. In addition, they highlight that the stock market reaction to the prior acquisition announcement acts as an important reference point in acquisition decisions. Copyright © 2014 John Wiley & Sons, Ltd.

INTRODUCTION

What factors affect managerial risk taking behavior in acquisitions? Economic approaches have traditionally emphasized the role of synergies. In these views, risk neutral managers acting in the interests of shareholders choose targets primarily based on the economies of scale and scope they generate in combination with the acquirer’s resources. Behavioral and psychological approaches challenge this line of thinking. In these latter perspectives, targets are chosen not just based on the risk adjusted returns and the final asset positions they create, as prescribed by subjective utility theory, but also on the basis of cognitive perceptions and attitudes towards risk of the acquiring firm’s managers. In this vein, one behavioral factor whose effect on risk taking in acquisitions has been extensively studied is hubris (Roll, 1986). Prior research has found factors such as CEO overconfidence significantly impact various aspects of acquisition decisions, including premiums paid (Hayward and Hambrick, 1997; Malmendier and Tate, 2008).

In this paper our purpose is to extend the latter stream of work and provide additional evidence that is suggestive of the role of cognitive and psychological factors in acquisition decision making. In particular, we document that the risk associated with an acquisition decision is significantly related to the market reaction to the prior acquisition. We find that acquirers buy targets that are increasingly risky and volatile in terms of their stock returns both as the abnormal dollar gains associated with the prior acquisition announcement increase, and as the abnormal dollar losses increase (i.e. there is a V shaped relationship between prior market reactions and target stock volatility in the next deal).

The relationships we observe between prior market reactions and the risk associated with the subsequent acquisition (as reflected in target stock volatility) accord well with the predictions of prospect theory and the house money effect (Kahneman and Tversky, 1979; Thaler and Johnson, 1990; Tversky and Kahneman, 1992). Prospect theory suggests “a person who has not made peace

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with his losses is likely to accept gambles that would be unacceptable to him otherwise” (Kahneman and Tversky, 1979: 287). The house money effect posits that risk neutral decision makers are likely to become risk seeking in a subsequent decision when they experience a prior gain in a related decision “since losses are less painful after gains” (Barberis and Thaler, 2003). In these views, decisions are no longer made based on final asset positions, but rather on the basis of a reference point against which subsequent stimuli are evaluated. While these theories pertain to the individual level, to the extent that risk preferences of managers within firms are likely to be systematically influenced by similar considerations (Wiseman and Gomez-Mejia, 1998), we propose that they offer valuable insight into why acquiring firms appear to be choosing riskier targets in response to prior stock market gains and losses. Thus, while rational choice models have provided comprehensive explanations of various aspects of decision making in acquisitions, we posit that prospect theory/house money effect provide a complementary explanation that accords well with our observed findings of a V shaped relationship between prior market reactions and the risk associated with acquisition decisions.

Our paper contributes to the literature in the following ways. First, while so far previous research has focused on the impact of behavioral influences on specific aspects of acquisition decisions, such as premiums paid, our study adds to the growing literature (e.g. Matta and Beamish, 2008) that highlights that these factors also affect other dimensions of acquisitions, such as the characteristics of targets acquired. Second, our study adds to the incipient literature on reference points and their impact on acquisitions. In a recent paper Baker, Pan, and Wurgler (2012) show that price peaks in a target’s price (e.g. 13, 26 or 52 week high) disproportionately account for the observed bid prices in successful acquisitions. They argue this effect occurs because the three price peaks not only serve as convenient anchors during negotiations between acquirers and targets, but these price levels can also be easily justified to investors and boards of directors when seeking their approval of the merger. While Baker et al. (2012) focus on reference points that are likely to be salient during the bidding and deal making process, our focus is on reference points that are likely to impact the decisions of managers as they choose which targets to acquire. Third, our study also highlights additional types of agency behavior in acquisitions. Consistent with prospect theory, our results suggest that when decision makers within firms experience negative market reactions to their acquisition decisions, they do not readily come to terms with these losses and integrate them objectively with existing wealth positions. This leads to (risk neutral) managers becoming risk seeking in the subsequent decision in an attempt to restore their wealth and reputation, a behavior which may or may not be in the best interests of shareholders. Conversely, our results indicate that decision makers within firms may be taking a more benign attitude toward potential losses when they experience prior positive market reactions (Barberis and Thaler, 2003). The benign attitude may once again be stimulating (risk neutral) managers to take added risks in subsequent decisions, a behavior which may not necessarily maximize the value of the firm.

THEORY AND HYPOTHESES

As strategic decisions, acquisitions are associated with significant risks that can undermine value creation. These risks range from valuation (i.e. deciding how much to pay), to post acquisition integration (e.g. retaining key target personnel after the deal), to simply managing the target and its operations after the acquisition has occurred to maximize synergies. While these risks are primarily economic in nature, acquisitions tend to be decisions that are also particularly prone to behavioral biases (Jemison and Sitkin, 1986a, 1986b). The high-profile nature of these deals often creates a feeling of stimulation and excitement among managers, sometimes making the thrill of the chase more important than the actual realization of synergies. These behavioral aspects also make acquisitions a particularly fertile ground for studying the cognitive and psychological effects on risk taking posited by prospect theory and the house money effect.

Prospect theory divides decision making into two phases—framing and valuation. In the framing phase decision makers simplify the decision and encode it either as a probable gain or loss using a reference point. In the valuation phase, values are assigned to various outcomes based on the encoding. In standard formulations of prospect theory the reference point is assumed to be current wealth. This reference point implies that decisions are encoded as losses or gains in isolation, with
Impact of Prior Market Reaction on Risk Taking in Acquisitions

prior outcomes playing a minimal role (Bromiley, 2010). In contrast with classical formulations of prospect theory, Thaler and Johnson (1990) specifically focus on complex decision scenarios where there is a sequence of related decisions, rather than a decision in isolation. They argue that when there is a sequence of related decisions over time, decision makers build a more inclusive mental account rather than a minimal account of the decision. In these mental accounts, gains and losses from prior related acts are carried forward and are integrated with outcomes of current decisions based on various cognitive reference points and editing rules.

In their laboratory experiments, Thaler and Johnson (1990) propose and test a variety of editing rules in complex decision scenarios. Two editing rules in particular find support in their study. Consistent with the notion of “hedonic editing”, they find decision makers tend to become risk seeking when they experience prior gains in a related decision. They ascribe the tendency to the house money effect—an editing rule wherein decision makers code potential losses as a reduction in gains rather than as losses in and of themselves. Conversely, they also find decision makers become risk seeking in subsequent decisions when they incur prior losses in a related decision. In particular, decision makers tend to accept higher levels of risk than they would otherwise accept when a gamble offers the possibility of breaking even and restoring neutral wealth positions. They argue that the latter behavior is consistent with the editing rules of prospect theory where outcomes that facilitate cancellation (Kahneman and Tversky, 1979) are given preference over other outcomes.

Thaler and Johnson’s (1990) experimental results offer important insights that can also be extended to examine risk taking behavior in a sequence of decisions such as acquisitions. For our purposes, building on their insights entails identifying first potential reference points that managers are likely to use in their editing rules when encoding prior acquisition outcomes as losses/gains, and second how their risk taking preferences are likely to change based on these loss/gain frames in the subsequent acquisition.

Our contention is that one candidate reference point that is likely to be particularly salient in decision makers’ minds as they undertake a sequence of acquisitions is the stock market reaction to the prior acquisition. There are various reasons why this may be the case. First, stock market reactions are particularly powerful stimuli that garner a disproportionate amount of attention from managers, especially when acquisitions are involved. In support of this point, Luo (2005) shows that there is a greater probability of a firm calling off merger negotiations and canceling its acquisition when it experiences a negative market reaction to the initial acquisition announcement, as opposed to a positive reaction. Luo’s (2005) finding, while pertaining to the current deal, suggests that managers pay enough attention to market reactions so much so that they may even reverse their acquisition decisions depending upon how the market reacts.

Second, prior research applying prospect theory to organizational settings has typically examined the risk taking behavior of individuals such as CEOs. In these studies, the focus is on reference points that are relevant to the wealth of these particular individuals, such as the exercise price of their stock options. But apart from these individuals, market reactions to events such as acquisitions may also affect the wealth positions of multiple decision makers spread throughout the firm (e.g. through current stock holdings, future employment prospects etc.). These decision makers may include various senior level managers, such as the board of directors and the top management team. To the extent that these senior managers are actively involved in acquisition decision making, it may further reinforce the effects of prior market reactions in creating reference points when making subsequent decisions.

Apart from these factors, it is also worth noting that market reactions can take both positive as well as negative values. In the case of acquisitions, it is particularly difficult to predict ex-ante the directionality of the market’s reaction, given that acquirers on average have been found to break even when acquisitions are announced. The likelihood of both negative and positive values suggests that these reactions may create both loss frames as well as gain frames with equal probability, making them akin to mixed gambles (Devers, Wiseman, and Holmes, 2007) which are the focus of the experimental settings of Kahneman and Tversky (1979) and Thaler and Johnson (1990).

Given that market reactions can act as reference points through these various mechanisms, we may now draw on insights from prospect theory/house money effect to link these reactions to risk taking behavior in future acquisitions. Prospect theory’s
prediction is that decision makers become risk seeking when they are unable to adapt completely to their prior losses and integrate them objectively with their current wealth positions. There are various reasons why prior negative market reactions may not be integrated objectively with the wealth positions of decision makers in the case of acquisitions. As already noted, market reactions to acquisitions are highly visible outcomes. To the extent that they garner the attention of various stakeholders such as institutional investors, negative reactions are likely to substantively affect the wealth positions of managers both through direct reductions in the value of stock holdings, as well as through other mechanisms such as compensation adjustments. In support of this point, Lehn and Zhao (2006) demonstrate that firms that experience negative returns around their acquisition announcement are more likely to dismiss their CEOs in the five-year after period. Moreover, negative market reactions may also result in managers earning the reputation of being poor deal makers. Acquisitions are often pursued for reasons such as prestige (Avery, Chevalier, and Schaefer, 1998). While the high-profile nature of these deals can bring managers social recognition among peer groups and the business community, it can also make them particularly sensitive to losses. As a consequence when the market reacts negatively to a prior deal, it could result in managers diverting further energies to future acquisitions in a bid to save reputation. These negative reputation effects are once again likely to be felt not just by CEOs but also by other decision makers as well, such as top managers and members of the board of directors. Prospect theory predicts that the outcome of these factors is likely to be enhanced risk taking as managers search for targets that potentially cancel prior market losses while restoring reputations and break even positions. Hence:

**Hypothesis 1:** Among firms that have experienced a negative market reaction to the prior acquisition announcement, there will be an increasing relationship between prior abnormal market losses and the risk associated with the current acquisition.

Hypothesis 1 assumes that managers will be uniformly risk seeking over the amount of prior losses. The intuition is that when prior losses are large, they are unlikely to be offset by acquiring targets that involve low risk and variability, especially if break even positions are to be restored, leading to a monotonic relationship.

In contrast with prospect theory, the house money effect outlines why decision makers may become risk seeking as opposed to staying risk neutral when they experience prior gains in related decisions. As noted earlier, the central mechanism proposed by Thaler and Johnson (1990) is that risk seeking occurs in these instances due to a hedonic editing process whereby losses are encoded as a reduction in gains, rather than as losses in and of themselves. When there is a prior positive market reaction to an acquisition announcement, managers may become risk seeking because there is greater slack and cushion created to absorb subsequent losses. The same quantum of losses may appear less intimidating (e.g., in terms of damage to future employment prospects and reputations) after a positive prior reaction than if it were incurred after a neutral position. On their part, shareholders may also take a more lenient view of managerial mistakes and are less likely to take punitive actions, such as compensation adjustments after prior positive reactions. Strengthening these effects, March and Shapira (1987) report that while overwhelmingly managers feel that risk taking is an integral part of organizational life, more often than not they are constrained from such risk taking in their day to day decisions for fear of retribution by stakeholders. When prior acquisitions exceed investor expectations, managers may see a brief window of opportunity to take higher risks while experiencing feelings of excitement and stimulation. Hence we predict:

**Hypothesis 2:** Among firms that have experienced a positive market reaction to the prior acquisition announcement, there will be an increasing relationship between prior abnormal market gains and the risk associated with the current acquisition.

### DATA AND METHODOLOGY

#### Sample

We utilize mergers and acquisitions data obtained from Thomson’s SDC database. We first extracted all deals over the 1990–2006 period. The year 2006 was used as a cut off to avoid any effects
of the financial crisis. We then retained all completed deals in the sample where the acquirer and target were US based public firms. Because we used abnormal losses and gains from the previous acquisition announcement as independent variables, we eliminated deals where the acquirer had only one acquisition and had no prior deal listed in SDC during 1990–2006. We also excluded all acquirers that belonged to utilities or financial services industries. After applying these criteria, and after obtaining data for the independent variables, we were left with a sample of 823 observations. We obtained stock price data from CRSP. We use the COMPUS-TAT database for constructing all other firm-specific accounting variables.

**Dependent variable**

We measure the risk using target stock volatility (Target Risk in tables). We calculated volatility as the standard deviation of the daily returns of the target from 275 to 30 days prior to the earliest acquisition announcement date. Various researchers have used stock volatility as a measure of firm-specific uncertainty (e.g. Beckman, Haunschild, and Phillips, 2004). The higher the stock volatility of the target, the more idiosyncratic its resources. These idiosyncratic resources enhance both ex-ante risks such as valuation, and ex-post risks such as post merger integration. Furthermore, prior evidence suggests volatile stocks also tend to be very sensitive to market sentiment while attracting a disproportionate amount of attention from investors and speculators (Baker and Wurgler, 2007). Thus, they tend to be relatively high-profile stocks when compared to their industry peers. Given these features, Doukas and Zhang (2013) note that acquisitions involving targets with high volatility are “lottery-like” in nature in the sense that acquiring such targets is more akin to gambling behavior rather than decision making driven by fundamentals. We posit that these very features also make volatile targets attractive for managers driven by behavioral considerations in their acquisition decisions. Thus, from a behavioral standpoint, targets with volatile returns are likely to appear attractive to managers attempting to reinstate their reputations while attempting to cancel prior losses. Conversely, acquiring these targets may also provide stimulation through risk taking opportunities for managers seeking risk in the face of prior market gains.

It is important at this juncture to distinguish our approach from Performance Feed Back Theory (PFT)/Behavioral Theory of the Firm (BTOF) (Cyert and March, 1963; Greve, 1998). While these perspectives suggest firms may conduct slack search/problemistic search for better solutions in response to performance feedback (including from the stock market; Haleblian, Kim, and Rajagopalan, 2006), they do not suggest a link between these feedback mechanisms and purely financial measures of risk, such as target stock volatility, which is the focus of our study. Arguably these perspectives suggest an association between prior market reactions and various learning based measures such as the R&D intensity of the target acquired as firms search the landscape and attempt to find better solutions. While we do not investigate these issues in depth here, as noted in the discussion, we see them as fruitful avenues for further research.

**Independent variable**

The primary independent variable in our regressions is the prior abnormal market gains/losses experienced by the acquirer at the time of the previous acquisition announcement. We use the dollar value of abnormal returns (Absolute Prior DV in the tables), obtained by multiplying the market capitalization with the percentage abnormal returns surrounding the prior acquisition announcement. The event window for the calculation of abnormal returns was chosen to be (−5, +5) days with t = 0 representing the announcement date of the previous acquisition (Haleblian and Finkelstein, 1999). The abnormal dollar returns were calculated by first regressing acquirer daily returns (Rit) on market returns (Rmt) over the period t = −250 to −50 and then obtaining the cumulative residuals over the period (−5, +5). After the abnormal returns were cumulated for the period (−5, +5), we then multiplied the returns by market value of the acquirer to obtain the dollar value of abnormal return from the prior acquisition announcement.

We use dollar values rather than percentage abnormal returns because prior research suggests there are important size effects in market reactions to acquisition announcements (Moeller, Schlingeman, and Stulz, 2004). In particular, after controlling for a variety of explanations, Moeller et al. (2004) find larger acquirers experience higher wealth destruction in dollar terms when compared to smaller firms, indicating that these differences...
in wealth effects are not attributable to mechanical factors alone. Hence we use abnormal dollar value to more accurately capture variations in the value created across acquirers of different size. In addition to dollar values, we also present robustness checks with percentage abnormal returns (Absolute Prior AR in the tables) over (−5, +5) as the independent variable.

Consistent with prior research, in our sample, acquirers experienced a percentage abnormal return that was marginally positive at 0.68 percent in their previous acquisition. The average dollar value of wealth created in the previous acquisition was -$24 million. These figures are similar to those reported in previous research (e.g., Andrade, Mitchell, and Stafford, 2001).

Controls

We control for accounting performance of the acquirer using return on assets (Acquirer ROA in the tables), calculated as operating income divided by total assets. ROA controls for the impact of any changes in risk taking behavior due to firm performance, rather than due to stock market reactions (Cyert and March, 1963). We control for acquirer size (Acquirer Size in the tables) calculated as the logarithm of total sales. Larger acquirers have a greater ability to absorb risky targets when compared to smaller acquirers (Audia and Greve, 2006), or alternatively larger acquirers could also be more risk averse (e.g. Haleblian et al., 2012). We control for the market-to-book of acquirer (Acquirer MB in the tables) as a proxy for acquirer Tobin’s Q. The measure was calculated as the log of the ratio of market value of equity (product of common shares outstanding and yearly closing price) divided by book value of assets. Finally, at the firm level, we also control for the acquisition experience (Acquisition Experience in the tables) of the acquirer by counting the total number of acquisitions completed between 1990 and the focal acquisition. Since this variable was skewed, we took logs.

At the acquisition transaction level, we control for the method of payment (Cash, Stock, Cash and Stock, Other) in the current acquisition since acquirers with unobserved overvalued stock may use their stock to pursue more risky targets. Because risk preferences are likely to be affected by capital structure considerations, we control for acquirer leverage, calculated as the ratio of debt to equity of the acquirer (Acquirer Debt/Equity in the tables). In addition, we control for time between acquisitions (Time Since Prior Acquisition in the tables), measured as log of the days since the last acquisition (Hayward, 2002), as greater time between acquisitions might weaken the influences of stock market reactions as reference points in managers’ mental accounts. Next, we also control for target-acquirer relatedness (Relatedness in the tables) since all else equal, it is less risky to acquire a target with volatile returns if the target is in the same industry (Capron and Shen, 2007). We control for acquirer-target relatedness by constructing a continuous measure similar to Haleblian and Finkelstein (1999) and Laamanen and Keil (2008). Because merger and acquisition activity is influenced by business cycles, we include dummy variables for year effects. In addition, we control for acquirer industry and target industries by creating dummy variables at the one digit sic level.

Empirical model and hypotheses tests

We specify the following regression model to test our hypotheses:

\[
\text{Target Risk}_{N+1} = a_0 + a_1 \times D_1 \\
\times \text{Absolute Prior Dollar} \\
\text{Abnormal Return}_N + a_2 \times D_2 \\
\times \text{Absolute Prior Dollar} \\
\text{Prior Dollar Abnormal Return} \\
n_N + \text{Controls} + \epsilon
\]

The dependent variable is the stock volatility of the target in the N + 1th acquisition. On the right-hand side, we enter the absolute dollar value of the abnormal returns surrounding the prior acquisition announcement. In the above specification the indicator variable \(D_1\) takes on a value of 1 when the prior abnormal dollar returns are negative and 0 otherwise. Analogous to \(D_1\), \(D_2\) is an indicator variable that takes on a value of 1 when there is a prior abnormal gain and 0 otherwise. The specification explicitly incorporates changes in risk taking behavior around the zero abnormal reaction point (i.e. it tests a V shaped relationship as opposed to a monotonically increasing/decreasing relationship between market reactions and risk). Hypothesis 1 suggests \(a_1 > 0\) and Hypothesis 2 suggests \(a_2 > 0\). The model was estimated using clustered standard errors.
RESULTS

Table 1 presents the summary statistics and the correlations. The average standard deviation of stock returns of targets (winsorized at the 5% level) in our sample was 4.5 percent. Amihud (2002) reports a standard deviation of 2.1 percent for stocks listed on the NYSE during 1963–1996. Our sample of targets is thus comprised of firms that were on average riskier than the average firm listed on the NYSE (Fama and French, 2004). The summary statistics also revealed that the average dollar gain in the current acquisition was $-58 million (not reported) compared to the prior deal gain of $-24 million (not reported). In terms of percentage abnormal returns, acquirers on average experienced a negative abnormal return of -1.28 percent compared to the previous gain of 0.68 percent. These figures are consistent with prior studies which document declining abnormal returns from one deal to another in acquisition programs (Ahern, 2008; Aktas, De Bodt, and Roll, 2011). All correlations between variables were within the acceptable range, indicating no serious problems of multicollinearity.

As a first step in our analysis, we conducted a regression between target risk and the dollar value abnormal returns from the previous acquisition to test for a monotonic relationship between the two variables. The results (not reported) showed that there was an insignificant relationship. Table 2, column I presents the regression with control variables alone. Column II presents the regression results using the specification described in equation (1). As shown in column II in Table 2, the two interaction variables were significant and positive. These results support Hypotheses 1 and 2. Column III presents results when we use percentage abnormal returns as the independent variables. The impact of positive percentage abnormal returns is insignificant and weaker in this regression, while the impact of negative percentage abnormal returns continued to be significant. In terms of effect sizes, column II indicates that a prior negative reaction of 190 Mn (the mean value) increased target volatility by 0.001 (5.47 × 190.9/10^6, since the dollar values were scaled by Billion in Table 2). A prior positive reaction of 165.9 Mn (the mean value), increased target volatility by 0.0011 (6.82 × 166.6/10^6). As a point of comparison, a one standard deviation increase in acquirer Q increased target stock volatility by 0.003 (natural logarithm of 2.19 × 0.0038).

Column V and VII use two additional measures of target risk as robustness checks: Tobin’s Q and stock beta. High Q firms are likely to be risky targets because intangible assets are often difficult to value and integrate. We calculated Tobin’s Q of the target similar to acquirer Q as the market value of equity to book value of assets. Column V shows that our hypotheses were supported with Q as the measure of risk, although once again the effect of positive abnormal dollar values was weaker. Column VII shows the regression results with stock beta. Beta of the target was obtained by estimating the market model for each target over −275 to −30 days prior to the acquisition. While beta is an accepted measure of systematic risk, it does not reflect firm-specific idiosyncratic risk which is captured in stock volatility. The results in column VII are once again supportive of our hypotheses.

As a final step we also examined the value implications of the risk seeking behavior in response to prior abnormal dollar gains/losses by looking at the market reaction to the current acquisition (results not reported). We find some evidence that risk seeking in response to prior losses does destroy value in the current acquisition, although the effects were weak. Risk seeking in response to prior gains neither created nor destroyed value, indicating that some of these risky bets may have been viewed favorably by the market.

DISCUSSION AND CONCLUSION

We tested the relationship between prior stock market reactions to acquisition announcements and the risk associated with the subsequent acquisition. Economic models suggest there should be no relationship between these variables since risk neutral managers would primarily be influenced by synergies in their acquisition choices. Cognitive and behavioral perspectives, on the other hand, suggest a relationship is plausible because prior market reactions can cause systematic shifts in risk preferences among decision makers while creating loss/gain frames. In this regard prospect theory and the house money effect highlight specific mechanisms that can provide insight into the risk seeking behaviors that potentially underlie the V shaped pattern that we observed in our data. In the context of acquisitions, consistent with prospect theory, we argued managers may be “unable to
Table 1. Summary statistics

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<tr>
<td>8. Time since prior acq</td>
<td>2.16</td>
<td>0.67</td>
<td>0.02</td>
<td>−0.06</td>
<td>−0.04</td>
<td>−0.14</td>
<td>−0.17</td>
<td>0.04</td>
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<tr>
<td>9. Acquirer MB</td>
<td>2.19</td>
<td>2.12</td>
<td>0.2*</td>
<td>0.44*</td>
<td>0.22*</td>
<td>0.19*</td>
<td>0.22*</td>
<td>0.04</td>
<td>0.04</td>
<td>−0.13*</td>
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<td>10. Acq. experience</td>
<td>10.7</td>
<td>12.47</td>
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<td>0.05</td>
<td>0.11*</td>
<td>0.2*</td>
<td>0.33*</td>
<td>−0.12*</td>
<td>−0.004*</td>
<td>−0.34*</td>
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<tr>
<td>11. Cash only</td>
<td>0.36</td>
<td>0.48</td>
<td>−0.05</td>
<td>−0.09*</td>
<td>−0.1*</td>
<td>0.07*</td>
<td>0.03</td>
<td>−0.09*</td>
<td>−0.07*</td>
<td>0.02</td>
<td>−0.12*</td>
<td>0.09*</td>
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<tr>
<td>12. Stock &amp; cash</td>
<td>0.17</td>
<td>0.38</td>
<td>−0.13*</td>
<td>−0.14*</td>
<td>−0.05</td>
<td>−0.05</td>
<td>−0.08*</td>
<td>0.05</td>
<td>−0.03</td>
<td>0.03</td>
<td>−0.14*</td>
<td>−0.07*</td>
<td>−0.34*</td>
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<tr>
<td>13. Stocks only</td>
<td>0.35</td>
<td>0.48</td>
<td>0.09*</td>
<td>0.18*</td>
<td>0.07</td>
<td>−0.07</td>
<td>0.03</td>
<td>0.11*</td>
<td>0.1*</td>
<td>−0.05</td>
<td>0.19*</td>
<td>−0.07*</td>
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<td>14. Acq. debt/equity</td>
<td>0.25</td>
<td>0.40</td>
<td>−0.09*</td>
<td>−0.26*</td>
<td>−0.12*</td>
<td>−0.14*</td>
<td>−0.12*</td>
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<td>−0.02</td>
<td>−0.01</td>
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<td>15. Acq. size</td>
<td>7.18</td>
<td>2.07</td>
<td>−0.29*</td>
<td>0.05</td>
<td>0.09*</td>
<td>0.39*</td>
<td>0.34*</td>
<td>−0.19*</td>
<td>−0.12*</td>
<td>−0.16*</td>
<td>−0.01</td>
<td>0.43*</td>
<td>0.21*</td>
<td>−0.05</td>
<td>−0.21*</td>
<td>−0.02</td>
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<tr>
<td>16. Acq. ROA</td>
<td>0.14</td>
<td>0.15</td>
<td>−0.28*</td>
<td>0.09*</td>
<td>−0.002</td>
<td>0.14*</td>
<td>0.08*</td>
<td>−0.13*</td>
<td>−0.16*</td>
<td>−0.013</td>
<td>0.24*</td>
<td>0.14*</td>
<td>0.1*</td>
<td>−0.07</td>
<td>−0.1*</td>
<td>−0.16*</td>
<td>0.43*</td>
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<tr>
<td>17. Relatedness</td>
<td>2.96</td>
<td>2.61</td>
<td>−0.01</td>
<td>0.03</td>
<td>0.07</td>
<td>−0.08*</td>
<td>−0.06</td>
<td>0.03</td>
<td>−0.01</td>
<td>0.07*</td>
<td>0.02</td>
<td>−0.08*</td>
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<td>0.12*</td>
<td>0.03</td>
<td>0.01</td>
<td>−0.17*</td>
<td>−0.03</td>
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</table>

$^a$ DV refers to dollar value acquisition return which is equal to the product of market cap and abnormal returns at acquisition announcement.

$^b$ D2 is 1 if prior acquisition abnormal returns are positive and 0 otherwise.

$^c$ D1 is 1 if prior acquisition abnormal returns are negative and 0 otherwise.

$^d$ AR refers to abnormal returns firms obtain at the acquisition announcement.

$^p < 0.05$ N = 823, N for target beta is 779.
Impact of Prior Market Reaction on Risk Taking in Acquisitions

Table 2. Impact of prior market reaction on target risk

<table>
<thead>
<tr>
<th>Variables</th>
<th>(I) Target risk</th>
<th>(II) Target risk</th>
<th>(III) Target risk</th>
<th>(IV) Target Q</th>
<th>(V) Target Q</th>
<th>(VI) Target beta</th>
<th>(VII) Target beta</th>
</tr>
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<tr>
<td>Absolute prior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>DV × D1a</td>
<td>5.4770**</td>
<td></td>
<td></td>
<td>347.6009*</td>
<td></td>
<td>264.4888**</td>
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</tr>
<tr>
<td>Absolute prior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>DV × D2b</td>
<td>(1.7678)</td>
<td></td>
<td></td>
<td>(145.5540)</td>
<td>(76.7841)</td>
<td></td>
<td></td>
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<tr>
<td>Absolute prior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AR × D1</td>
<td>(2.1601)</td>
<td>0.0185*</td>
<td></td>
<td>(206.9821)</td>
<td>(101.6094)</td>
<td></td>
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</tr>
<tr>
<td>Absolute prior</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>AR × D2</td>
<td></td>
<td>0.0103</td>
<td></td>
<td></td>
<td>(0.0093)</td>
<td></td>
<td></td>
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<tr>
<td>Time since prior acquisition</td>
<td>0.0008</td>
<td>0.0011</td>
<td>0.0008</td>
<td>-0.0675</td>
<td>-0.0498</td>
<td>0.0013</td>
<td>0.0180</td>
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<td>Acquirer MB</td>
<td>0.0050***</td>
<td>0.0038***</td>
<td>0.0050***</td>
<td>0.9732***</td>
<td>0.9043***</td>
<td>0.2358***</td>
<td>0.1773***</td>
</tr>
<tr>
<td>Acquisition experience</td>
<td>-0.0010</td>
<td>-0.0012</td>
<td>-0.0009</td>
<td>-0.1758*</td>
<td>-0.1879*</td>
<td>-0.0064</td>
<td>-0.0140</td>
</tr>
<tr>
<td>Cash only</td>
<td>-0.0063*</td>
<td>-0.0062*</td>
<td>-0.0063*</td>
<td>-0.1306</td>
<td>-0.1224</td>
<td>-0.2776***</td>
<td>-0.2666***</td>
</tr>
<tr>
<td>Stock &amp; cash</td>
<td>-0.0135***</td>
<td>-0.0130***</td>
<td>-0.0136***</td>
<td>-0.3052</td>
<td>-0.2761</td>
<td>-0.2117*</td>
<td>-0.1849*</td>
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<tr>
<td>Stocks only</td>
<td>-0.0096***</td>
<td>-0.0096***</td>
<td>-0.0098***</td>
<td>0.2789</td>
<td>0.2790</td>
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<td>-0.1328</td>
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<td>Acquirer debt/equity</td>
<td>0.0014</td>
<td>0.0013</td>
<td>0.0014</td>
<td>0.4684**</td>
<td>0.4583**</td>
<td>0.1493*</td>
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<tr>
<td>Acquirer size</td>
<td>-0.0018***</td>
<td>-0.0027***</td>
<td>-0.0017***</td>
<td>0.0957**</td>
<td>0.0442</td>
<td>0.0588***</td>
<td>0.0145</td>
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<tr>
<td>Acquirer ROA</td>
<td>-0.0333***</td>
<td>-0.0305***</td>
<td>-0.0322***</td>
<td>-0.6318</td>
<td>-0.4615</td>
<td>-0.5955*</td>
<td>-0.4382</td>
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<tr>
<td>Relatedness</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>-0.0001</td>
<td>0.0206</td>
<td>0.0224</td>
<td>0.0130</td>
<td>0.0144</td>
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<tr>
<td>Target &amp; acquirer Ind. FE</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Year FE</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Constant</td>
<td>0.0558***</td>
<td>0.0634***</td>
<td>0.0548***</td>
<td>-0.2669</td>
<td>0.1896</td>
<td>-0.0735</td>
<td>0.2834</td>
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<td>Observations</td>
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<td>823</td>
<td>823</td>
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<td>779</td>
<td>779</td>
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<td>R-squared</td>
<td>0.390</td>
<td>0.399</td>
<td>0.393</td>
<td>0.304</td>
<td>0.310</td>
<td>0.237</td>
<td>0.259</td>
</tr>
<tr>
<td>Adj. R-squared</td>
<td>0.359</td>
<td>0.367</td>
<td>0.360</td>
<td>0.268</td>
<td>0.272</td>
<td>0.195</td>
<td>0.217</td>
</tr>
</tbody>
</table>

a D1 is 1 if prior acquisition abnormal returns are negative and 0 otherwise.
b D2 is 1 if prior acquisition abnormal returns are positive and 0 otherwise.
Robust standard errors in parentheses.
*** p < 0.001; ** p < 0.01; * p < 0.05; p < 0.1

make peace with their losses” since prior negative market reactions may not only reduce the value of stock holdings, but also harm future employment prospects and reputations. Conversely, consistent with the house money effect, we proposed that managers may view potential losses as less painful after prior market gains due to the financial slack and cushion created. On their part, investors too may take a more lenient view of managerial mistakes and losses after prior gains, which may create a window of opportunity for managers to engage in enhanced risk taking. Our study is the first to document a relationship between prior stock market reactions and the risk associated with acquisitions. A key implication of our study is that prior market reactions act as an important reference point for managers in their acquisition decisions.

Future research could extend our study in various ways. First, we have used aggregate firm level measures to demonstrate the impact of prior market reactions on risk. More detailed, micro analytic studies can be conducted where managers are
directly questioned as to what extent their behavior is modified by prior market reactions, and the underlying reasons for it. Second and relatedly, our study also tests prospect theory/house money effect very broadly. While we build on ideas that are core to these perspectives, we do not consider more refined relationships such as the ways the shape of the value function and the decision weights assigned can vary across firms. Third, our study does not examine the conditions under which the risk seeking behaviors we posit in response to market reactions are enhanced or are weakened. In this regard, future studies could study the impact of factors such as institutional ownership in acquiring firms, the time between acquisitions, and the effects of organizational age (Desai, 2008). Fourth, our study and its results are also open to alternative interpretations. When developing the hypothesis regarding the impact of positive market reactions on further risk taking, we argued that the primary cognitive mechanism underlying the relationship was the encoding of losses as reduction in gains. However, other related factors may also be at work simultaneously such as hubris and overconfidence. Fifth, in our study we mainly considered one measure of risk, target stock volatility. We took this approach because a relationship between prior market reactions and this particular measure of target risk implicates cognitive/behavioral considerations, and is perhaps the most difficult to justify on synergy/learning grounds. Future research could consider additional measures to tease out various dimensions of risk in acquisitions, such as size of targets subsequently acquired and target relatedness. Finally, we also see rich opportunities for integrating our work with insights from Performance Feedback Theory/Behavioral Theory of the Firm. As such, the effects of markets in providing performance feedback has remained underexplored in the strategy area. While the effect of market reactions as sources of long term learning needs to be interpreted with adequate caution (Zollo and Meier, 2008), we believe PFT/BTOF can provide complementary propositions to cognitive and psychological approaches to tease out the interplay between stock markets and firm strategy.

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REFERENCES

Impact of Prior Market Reaction on Risk Taking in Acquisitions


