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journal homepage: www.elsevier.com/locate/jfecThe effect of reference point prices on mergers and acquisitions[☆]Malcolm Baker^a, Xin Pan^b, Jeffrey Wurgler^{c,*}^a Harvard Business School and NBER, United States^b Harvard University, United States^c NYU Stern School of Business and NBER, United States

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ABSTRACT

Prior stock price peaks of targets affect several aspects of merger and acquisition activity. Offer prices are biased toward recent peak prices although they are economically unremarkable. An offer's probability of acceptance jumps discontinuously when it exceeds a peak price. Conversely, bidder shareholders react more negatively as the offer price is influenced upward toward a peak. Merger waves occur when high returns on the market and likely targets make it easier for bidders to offer a peak price. Parties thus appear to use recent peaks as reference points or anchors to simplify the complex tasks of valuation and negotiation.

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1. Introduction

The price that a bidding firm offers for a target is generally the outcome of a negotiation with the target's board. The standard textbook story emphasizes synergies.

The offer price starts with an estimate of the increased value of the combined entity under the new corporate structure, deriving from cost reductions in labor or capital equipment, supply chain reliability, debt tax shields, market power, market access and expertise, improved management, internal finance, and other economic factors (e.g., Lang, Stulz, and Walkling, 1989; or Jovanovic and Rousseau, 2002). This value gain is then divided between the two entities' shareholders according to their relative bargaining power. In theory, the textbooks suggest, all of this leads to an objective and specific price for the target's shares.

In practice, valuing a company is subjective. A large number of assumptions are needed to justify any particular valuation of the combination. In addition, relative bargaining power cannot be fully established. Boards can bluff in the negotiation. Other bidders could emerge. These real-life considerations mean the appropriate target price cannot be set with precision, but established only within a broad range. We hypothesize that this indeterminacy, in

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turn, creates space for the price offered and its reception to reflect other influences, in particular the psychological influences on the board of the target and the bidder and target shareholders, who ultimately must approve the price.

In particular, we propose that salient but largely irrelevant reference point stock prices of the target play roles in merger and acquisition activity through both the prices and the types and quantities of firms traded. This psychological motivation has well-established roots in the anchoring-and-conservative-adjustment estimation method (Tversky and Kahneman, 1974), the salience of initial anchor positions in negotiations, and the prospect theory tenet that the utility of an outcome is a function of the outcome's distance from a reference point.

The reference point stock prices that we focus on are the peak prices that the target has achieved over various horizons, such as the 13-week high, 26-week high, and so on. The 52-week high price, for example, is routinely reported and discussed in the financial press and is salient to executives, boards, and investors. Importantly, and in contrast to target shareholders' individual cost bases, which represent other natural reference point prices for individuals, these peak prices are reference prices that are common across stakeholders. We start with some anecdotes that suggest that practitioners do indeed give special weight to recent peak prices in target valuations: Target firm boards that are discouraging the deal often point out that the bid is below the recent high, while those that are encouraging the deal often note when the bid compares favorably with that price.

We start by considering the relationship between recent peak prices and the offer price. Our results show a visually and statistically obvious effect of recent peak prices. Histograms of offer prices show spikes at the 13-week high, 26-week high, 39-week high, 52-week high, and 104-week high. In other words, a peak price often serves not merely as a subtle psychological anchor but as one sufficiently heavy that there is no "adjustment" from it at all.

These peak prices are of incremental importance to the offer price decision. Controlling for the 13-week high, the 26-week high price has a statistically and economically significant effect on offer prices, and the 39-, 52-, and 65-week high prices also have independent explanatory power. (The 65-week high price effect could arise because some deals take several months to complete to the point that a formal public offer is announced, even if they begin with the prevailing 52-week high as an anchor. Separate from that effect, it seems unlikely that the private negotiation would in every case be so knife-edged, ignoring anything that fell, say, 53 weeks prior to announcement.) Having documented that multiple reference points matter, we focus on the 52-week high for simplicity. For 52-week highs of a typical size, a 10% increase in the 52-week high is associated with a 3.3% increase in the offer premium, controlling for a variety of bidder, target, and deal characteristics.

The effect of peak prices on offer prices survives a variety of control variables, robustness tests, and falsification tests. We examine the 52-week high's effect on offer

prices in various subsamples and consider non-psychological alternative explanations. Most notably, the 52-week high could be proxying for the objective, but unobserved value gain from combination. That is, it is the value to which the target assets could return if only they were managed as well by the bidder in the future as they were by the target in the past. This agency- or information-based hypothesis should perhaps be regarded as the null hypothesis. However, we find that the 52-week high of the market index also has a strong effect on offer prices. Because the market component of the target's 52-week high cannot be recovered merely by changing management, this hypothesis cannot, at least not fully, explain the 52-week high effect on offer prices.

The second dimension of merger activity we consider is deal success—what distinguishes bids that succeed from those that fail, and in particular whether the offer price's relationship to peak prices plays a role. Not surprisingly, higher offer prices are associated with higher probabilities of deal success; we control for this effect with a fourth-order polynomial of offer prices. The interesting finding is that an additional dummy variable indicates that the probability of deal success increases discontinuously by 4.4–6.4% when the bidder makes an offer price even slightly above the target's 52-week high.

Bidder announcement effects have been extensively studied. One hypothesis is that they include the market's estimate of overpayment. The offer premium itself is not a clean measure of overpayment, however, as better combinations may attract higher offer premiums. The 52-week high is an ideal instrument for the effects of overpayment in mergers and acquisitions, separate from synergies or misvaluation in the bidder. We find that the bidder's announcement effect becomes more negative with the target's distance from its 52-week high. The bidder announcement effect is 2.45% worse for each 10% increase in the component of offer premium that is explained by the 52-week high; this is quite large relative to the unconditional bidder announcement effects. Given the strong connection between 52-week highs and offer prices, an interpretation is that shareholders of the bidder may view the bidder as more likely to be overpaying when the target has fallen far below this reference price.

Apart from its impact on deal success and the value transfer in successful deals, high peak prices may deter bidders from appearing in the first place. The fourth and last aspect of merger activity that we examine is merger waves. It is well known that merger waves coincide with higher recent returns and stock market valuations. The potential link to reference price peaks is that higher market valuations mean that more targets are trading closer to their peak prices. Therefore, these reference points may become easier to satisfy (from the perspective of targets) and to justify (from the perspective of bidders) when valuations are high than when they have fallen. In this section, we use time-series data and so our tests are less refined. Not surprisingly, we find that the market's 52-week high relative to its current value is inversely related to the level of merger activity. More interesting is that the 52-week high matters controlling for the past 12 individual monthly returns. The effects are somewhat

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