On the Use of Failed Bids in Estimating the Treatment Effects of Mergers and Acquisitions*

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ABSTRACT

This paper evaluates the random assignment assumption underlying the quasi-experimental design that uses exogenously failed mergers. No merger failure is endogeneity-free, however, since withdrawal ultimately reflects a decision made by the firm. Moreover, potential heterogeneity in researchers' judgments when classifying failed bids undermines the reproducibility of research. Many deals classified as exogenously failed, such as those interrupted by competing bids, can alternatively be classified as endogenously failed, depending on the researcher's discretion. More importantly, I find evidence suggesting similarities between exogenously and endogenously failed acquirers. In tests of the market-timing theory of acquisitions, they exhibit similar stock performance, corroborating concerns about endogeneity in conventional exogenous failures. These findings indicate that empirical results in the literature depend critically on how and by whom firms are selected to serve as counterfactuals.

JEL Classification: C18, G14, G34

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1. Introduction

Estimating the treatment effects of mergers and acquisitions (M&As) on firm outcomes is challenging because of endogeneity inherent in merger decisions. For example, estimating the impact of technological synergy on post-merger innovation is confounded by selection bias because firms with more technological overlap are more likely to pursue mergers (Bena and Li, 2014). A commonly used approach to address self-selection and estimate the causal effects of acquisitions is to compare completed mergers with those that failed for exogenous reasons. This approach was first introduced by Savor and Lu (2009), and many studies (e.g., Seru, 2014; Ma, Ouimet, and Simintzi, 2025) later adopted the same approach by employing merger failures deemed exogenous to outcomes of interest.

The market-timing theory of acquisitions predicts that stock mergers create value by converting overvalued equity into tangible assets (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004). However, because more overvalued firms have stronger incentives to engage in stock acquisitions, negative post-merger returns are often observed among stock-financed acquirers even if such deals benefit their shareholders. Savor and Lu (2009) address this endogeneity problem by comparing successful stock bidders with unsuccessful ones whose bids failed for exogenous reasons unrelated to acquirer valuation. They find that successful stock bidders outperform unsuccessful ones and conclude that stock-financed acquirers create value for shareholders. This study is the first quasi-experimental test of the market-timing theory of acquisitions and makes a significant contribution to the literature.

Using the same identification strategy, Bena and Li (2014) report a positive impact of technological synergy on post-merger innovation output, and Seru (2014) reports a negative impact of internal capital markets on innovation after conglomerating mergers. Similarly, in a recent study, Li and Wang (2023) disentangle the treatment effects of mergers on collaboration between former acquirer and target inventors and on path-breaking innovation. These studies also make important contributions by addressing key questions in the literature on merger synergies.

The quasi-experimental approach helps estimate the treatment effects of acquisitions on firm outcomes. However, classifying failed merger bids involves considerable judgment (Malmendier, Opp, and Saidi, 2016). Researchers must ultimately decide whether a merger failure is endogenous or exogenous after reviewing news articles. Based on an extensive media search, I conduct an in-depth examination of failed mergers between 1978 and 2020 and find that withdrawn bids can be easily misclassified as exogenously failed. I find that many deals that seemingly failed for exogenous reasons were, in fact, scrapped for endogenous reasons. The most likely misclassification of failed mergers occurs with subsequent competing offers due to the complexity of such events involving multiple firms. By definition, these are bids by other firms for the same target made after the original bidder's first offer (Savor and Lu, 2009). However, bids are prone to misclassification as exogenously failed due to subsequent offers, even when this is not the case. Some bids were, in fact, rejected by targets before subsequent bidders appeared. Others were not original offers but rather late bids that failed to outbid the original bidders.

I document discrepancies, including potential misclassifications, by comparing my classification with that of Savor and Lu (2009). I then attempt to reproduce their main results to examine how differences in data affect empirical results. The outperformance of successful stock-financed acquirers relative to failed ones is substantially weaker in my results. To investigate the source of the weak results, I further examine the performance of each acquirer group that failed for similar reasons. Surprisingly, acquirers that failed for reasons regarded as exogenous, such as subsequent competing offers, perform similarly to those that failed for common endogenous reasons, including target refusal. This suggests that merger failures conventionally treated as exogenous may be unsuitable counterfactuals when their exogeneity is unclear and their outcomes resemble those of endogenous failures. In such cases, pooling all exogenous failures into a single broad category can complicate the estimation of treatment effects.

I argue that exogenously failed deals should be clearly disclosed so that readers can identify which ones are used as control firms. This is essential for reproducing the original results and can be accomplished with minimal effort. More importantly, such disclosure enables open discussions about which withdrawn bids are appropriate for specific research questions and allows cross-validation across researchers, whose judgments may differ. A study would be more convincing if the authors demonstrated how their results change when switching from all failed mergers to exogenously failed mergers as the counterfactual and discussed the extent to which selection bias is mitigated. Nevertheless, no merger failure can be established as exogenous to the same degree as in a randomized experiment. Therefore, even if all failed merger bids are classified as intended in the literature, withdrawn bids deemed exogenous should not be uncritically treated as exogenous to the outcome of interest without clear justification.

2. Data

2.1. Sample Construction

I construct the sample following Savor and Lu (2009). I follow all their criteria to consider only valid acquisitions. I focus on non-hostile bids (Deal Attitude: F, N, X, U) on SDC Platinum because hostile bids are more likely to fail. Each acquirer is a U.S. public firm (Acquirer Nation: US). An acquirer's market capitalization, measured at the end of the month preceding the merger announcement (or two months prior if unavailable), exceeds that of firms in the bottom decile based on NYSE size breakpoints. The market value of the target's equity, measured two trading days before the merger announcement (three or four trading days if unavailable), is at least 5% of the market value of the acquirer's equity.

A counterfactual is constructed from failed mergers that were abandoned for reasons deemed exogenous to the outcome of interest. I first consider all valid bids announced and subsequently withdrawn (Deal Status: IW, W) between 1978 and 2020, with payment structures recorded as stock only (Final Consideration Structure: SHARES), cash only (CASHO), or mixed (HYBRID). I then investigate 625 unsuccessful deals and their reasons for failure through a media search using Nexis Uni and Factiva. Unless the media search identifies noticeably different dates, I treat the dates recorded in SDC Platinum as the default.

2.2. Reasons for Failed Mergers

I collect all possible reasons for merger failure documented in the literature and classify the 625 failed mergers into 25 distinct reasons:

i. Regulatory disapproval (mostly due to antitrust concerns),

ii. Subsequent competing offers,

iii. Unexpected/adverse macroeconomic/market conditions,

iv. Unexpected legal actions,

v. Target's refusal,

vi. Disagreement over valuation,

vii. Difference in opinion over growth strategy,

viii. Disagreement over restructuring including top personnel matters (e.g., board composition),

ix. Inability to conclude negotiations,

x. Fall in acquirer's stock price,

xi. Increase in acquirer's stock price,

xii. Problems in acquirer's operations revealed over the course of negotiations,

xiii. Bad market reception / Acquirer-side skepticism,

xiv. Acquisition of the bidder,

xv. Acquirer's inability to obtain financing,

xvi. Fall in target's stock price,

xvii. Worsening conditions in target's operations,

xviii. Rating agency downgrade of target,

xix. Negative earnings surprise at target,

xx. Due diligence revelation about target,

xxi. Restatement of target's results,

xxii. Increase in target's valuation,

xxiii. Development in target's industry,

xxiv. Non-subsequent competing offers,

xxv. Not enough information / negotiations not completed.

I find that 10 withdrawn bids were later completed through acquisitions of the targets or purchases of their business units or assets. Table 1 presents the reasons for the withdrawal of the remaining 615 bids, along with their modes of payment. Notably, a target's refusal is the most common reason, regardless of the mode of payment. 144 bids were rejected by the targets. This reason is relatively more common in unsuccessful cash-financed acquisitions. One-third of the 193 cash-financed deals failed for this reason. The next most common reason for the failure of cash-financed deals is non-subsequent competing offers, which resulted in the collapse of 35 deals. Bids submitted by late bidders that failed to outbid the original bidders are classified as merger failures due to non-subsequent competing offers. In other words, these bids failed because the original bidders ultimately prevailed. By contrast, 24 cash-financed deals were original bids that failed due to subsequent competing offers. This evidence indicates that nearly two-thirds of the cash-financed acquisitions fell through due to target refusal or competing offers.

[Table 1 here]

Besides target refusal, which accounts for 18% of the failed stock acquisitions, most failures were caused by either a disagreement over valuation or an inability to conclude negotiations. Of the 265 stock-financed deals, one-fourth failed for these reasons. Specifically, 67 stock-financed deals could not be concluded because the two parties could not agree on issues such as valuation. This finding aligns with the characteristics of stock mergers, which typically involve extensive discussions and negotiations related to firm valuation.

I take particular care when assigning failed mergers to the category of subsequent competing offers. I ensure that only original bids withdrawn after subsequent bids appeared are included in this category. If a bid was withdrawn after a bidding war in which competing bids occurred around the same time, or if the withdrawn bid was not the original offer, it is assigned to the category of non-subsequent competing offers. If an offer was initially declined and the target subsequently accepted another offer, the original bid is assigned to the category of target's refusal, presumably because the offer was unsatisfactory. Also, if a subsequent competing offer was made by a white knight, the original offer was effectively rejected by the target. For example:

Crouse-Hinds officials have been fending off the advances of InterNorth for the last three months and turned to Cooper Industries as a "white knight" to save the company from a takeover bid by InterNorth which Crouse-Hinds officials termed inadequate. (Associated Press, December 10, 1980)

InterNorth lost a battle with Cooper Industries Inc. of Houston to take over the New York electrical equipment manufacturer. InterNorth started bidding for Crouse-Hinds stock in September. Cooper, a conglomerate equipment maker, entered the bidding in November. In Houston, Cooper's President Robert Cizik told the Omaha World-Herald that he "was pleased with InterNorth's decision" to withdraw. (Associated Press, December 10, 1980)

In this case, InterNorth seems to fail to acquire Crouse-Hinds because of the subsequent bidder, Cooper Industries. InterNorth initiated a bid for Crouse-Hinds in September 1980 (Deal Number: 692470020) but later lost to Cooper Industries, which entered the bidding in November. However, Crouse-Hinds certainly did not want to be acquired by InterNorth. Therefore, InterNorth's bid was effectively rejected by Crouse-Hinds.

As this case illustrates, categorizing failed mergers involves a substantial degree of judgment. As a result, different researchers may arrive at different classifications of the same failed mergers. In the next section, I discuss several cases of potential misclassification, emphasizing that the assignment of failed mergers relies on researchers' judgment and their capacity to identify the underlying reasons for failure.

3. Alternative Assignments of Failed Bids

Table 2 presents the exogenous reasons for merger failure adopted in five well-known studies published in leading journals. The two most common exogenous reasons are regulatory disapproval (mostly due to antitrust concerns) and the emergence of subsequent competing offers (Reasons i and ii). Other reasons can also be considered exogenous, depending on the outcome variable being investigated. For example, Ma et al. (2025) consider the collapse of a deal due to the acquisition of a bidder (Reason xiv) exogenous to their outcome variable, which is a target's labor demand. Seru (2014) considers unexpected legal action (Reason iv) exogenous to innovation, while Bena and Li (2014) do not. Li and Wang (2023) consider that facing difficulties in securing financing (Reason xv) is also unrelated to innovation. Because the emergence of subsequent competing bids may depend on target characteristics, I conjecture that Li and Wang (2023) and Ma et al. (2025) exclude bids that failed due to such offers from their control groups, since they investigate target-side outcomes. These different choices indicate that determining a counterfactual is nontrivial. Even if the set of exogenous reasons for failure is universally agreed upon for each post-merger firm outcome being examined, classifying failed mergers still depends heavily on qualitative judgment. Different researchers may interpret the same failed mergers differently.

[Table 2 here]

Savor and Lu (2009) find that unsuccessful stock bidders significantly underperform successful ones. They are the first to use exogenously failed merger bids as an identification strategy to address the endogeneity problem, namely that the most overvalued firms have the greatest incentive to engage in stock-financed acquisitions. Their classification of failed mergers has three broad categories: endogenously failed bids, restricted exogenously failed bids, and deals that failed due to unexpected target developments. In their paper, acquisitions that failed due to regulatory disapproval or subsequent competing offers are assigned to the Restricted Exogenous Failed Sample. The Exogenous Failed Sample further includes deals that failed due to unexpected target developments. Unexpected target developments correspond to Reasons xvi–xxiii, encompassing eight other reasons potentially unrelated to the valuation of an unsuccessful acquirer. I classify bids withdrawn for the remaining 15 reasons, including unanticipated macroeconomic conditions and unexpected legal actions, into the Endogenous Failed Sample.

A discrepancy arises when a withdrawn bid is classified as exogenously failed by one researcher but as endogenously failed by another, implying misclassification by at least one of them. I compare my classification of failed bids with that of Savor and Lu (2009) (henceforth, SL).[1] Among the 615 withdrawn bids in my data, 189 also appear in the provided data. Among the 189 matched deals, 141 are assigned to the same broad categories, indicating overall consistency between the two classifications. The remaining 48 deals serve as examples of discrepancies and are reported in Table 3. This is a sufficient number of deals to detect patterns of potential misclassification that may arise in studies using failed mergers.

[Table 3 here]

[1] I reiterate my gratitude to Pavel Savor for sharing his data on failed merger bids.

3.1. *Regulatory Disapproval*

I find that three deals assigned to the category of regulatory disapproval in the shared data failed for endogenous reasons according to my media search. These deals are between Florida Federal Savings & Loan Association and First Mutual Savings Association (Deal Number: 153475043), Integrated Health Services Inc. and Coram Healthcare Corp. (Deal Number: 598009020), and Guilford Pharmaceuticals Inc. and Gliatech Inc. (Deal Number: 1010766020).

In fact, the deal between Florida Federal and First Mutual was first blocked by the Federal Home Loan Bank Board (FHLBB) on October 27, 1983. Since First Mutual had converted from a mutual to a stock form, it had to wait a year before entering into a merger agreement according to the FHLBB policy.[2] Soon after, First Mutual signed an agreement to be acquired by Florida Federal in April 1984, and the agreement was approved by the FHLBB in October 1984.[3] However, the agreement was canceled on November 20, 1984 due to an inability to close the transaction.[4] Considering the entire bidding cycle of the deal, I assign it to Reason ix. Inability to conclude negotiations.

The deal between Integrated and Coram collapsed on April 7, 1997 because Integrated wanted to reduce its offer.[5] I find no clear evidence of a regulatory objection to this deal. Instead, the target, Coram, was involved in a lawsuit with another company, Caremark, at the time. I classify this deal into Reason vi. Disagreement over valuation. Even if this is assigned to Reason iv. Unexpected legal actions, it still falls within the Endogenous Failed Sample in my data.

Guilford decided not to acquire Gliatech in August 2000 because the FDA issued a report

[2] PR Newswire, October 28, 1983.

[3] American Banker, April 24, 1984; "First Mutual Savings Association of Florida to be acquired by Florida Federal Savings and Loan Association," Business Wire, October 15, 1984.

[4] PR Newswire, November 21, 1984.

[5] "INTEGRATED HEALTH SERVICES DROPS BID FOR DENVER'S CORAM HEALTHCARE CORP.," The Denver Post, April 8, 1997.

containing inspectional observations about ADCON(R)-L to Gliatech.[6] Although Gliatech could continue to market ADCON(R)-L, which was its only product, Guilford did not want any uncertainty regarding the outcome of the FDA's inspection. In this case, there was no regulatory body disapproving the acquisition. The acquirer backed off from the acquisition because the target was involved with the FDA. Therefore, I classify this case into Reason iv. Unexpected legal actions.

On the other hand, three deals that I classify into Reason i. Regulatory disapproval are assigned to different categories under the SL classification. I find that the deal between Affiliated Bankshares and IntraWest Financial Corp. (Deal Number: 95325020) was announced in April 1984 and collapsed in October 1985 because Affiliated could not obtain regulatory approval in a timely manner, and IntraWest did not extend the termination date of the merger agreement.[7] In the SL classification, this deal is attributed to a negative earnings surprise at the target. However, I find no evidence in the media search to support this.

I also find that Sierra Health Services Inc. killed the merger with Physician Corp. of America (Deal Number: 602312020) in March 1997, citing regulatory objections and the target's losses due to workers' compensation.[8] In the shared classification, this deal is classified as a failed merger due to a restatement of the target's results, whereas I consider it to have collapsed due to regulatory objections. In this case, both judgments are valid. This serves as a strong example of how discrepancies arise depending on who assigns withdrawn bids.

The merger agreement between PBOC Holdings and BYL Bancorp (Deal Number: 1043771020) was terminated because the Office of Thrift Supervision did not approve the deal by May 1, 2001. PBOC was acquired by FBOP Corp. in the meantime, effective April 30.[9] Although this merger is classified as a failed deal due to the acquisition of the bidder in the provided classification, I argue that the lack of regulatory approval was the primary cause of the col-

[6] "Gliatech Announces Termination of Guilford Merger Agreement," PR Newswire, August 28, 2000.
[7] "Affiliated - IntraWest merger is unlikely," Business Wire, October 24, 1985.
[8] "Sierra Ends Planned Purchase of Physician Corp.," The New York Times, March 19, 1997.
[9] "BYL Merger Terminated by PBOC," National Mortgage News, May 7, 2001.

lapse. Again, both judgments are defensible. This case provides another strong example of discrepancies in deal classification.

3.2. Subsequent Competing Offers

Withdrawn bids that competed with other offers are particularly prone to misclassification due to the complex dynamics involving multiple firms. Under the SL classification, 23 deals are categorized as withdrawn due to subsequent competing offers. However, I find that seven bids were rejected by targets, and fifteen were scrapped due to non-subsequent competing offers.

For example, on October 29, 1997, Tel-Save Holdings proposed a merger transaction to ACC Corp. (Dean Number: 706474020). However, ACC turned down the offer and agreed to be acquired by Teleport Communications on November 26, 1997.[10] Tel-Save then dropped its offer. Since Tel-Save and ACC had never entered into a merger agreement, Tel-Save's offer was effectively rejected by ACC, rather than being superseded by a subsequent offer from Teleport Communications. Another example is Cape Cod Bank & Trust's offer to Sandwich Bancorp (Deal Number: 733735020) on February 17, 1998. On December 4, 1998, Sandwich Bancorp was merged with CompassBank, which was the original suitor.[11] Sandwich Bancorp and CompassBank entered into a merger agreement on February 2, 1998.[12] In this case, the offer from Cape Cod was neither declined by the target nor defeated by a subsequent offer. The deal did not go through because of the original bidder, CompassBank. I thus assign this deal to Reason xxiv. Non-subsequent competing offers.

On the other hand, two deals that I classify as failed bids due to subsequent competing offers are considered rejected by targets in the SL classification. The first deal is between Dynamics Corp. of America and Lionel Corp. (Deal Number: 95161020). Lionel agreed

[10] "Teleport in $1 Billion Deal for ACC of Rochester," The New York Times, November 27, 1997.
[11] "Sandwich Bancorp and Seacoast Financial Complete Merger," Business Wire, December 3, 1998.
[12] "Sandwich Bancorp Receives Competing Merger Proposal From Cape Cod Bank and Trust Company," Business Wire, February 17, 1998.

to sell its 82 percent interest in Dale Electronics to Dynamics Corp. on February 27, 1984. Lionel terminated the agreement after Square D suggested a better offer on July 5, 1984.[13] Lionel and Dynamics Corp. entered into an amended agreement on December 10, 1984, saying that it is subject to the receipt of higher bids by September 18, 1985.[14] Dale Holdings, a joint venture between Mezzanine Capital and Vishay Intertechnology, completed the acquisition of all outstanding shares of Dale Electronics on November 2, 1985, following the announcement on September 19, 1985.[15] I therefore treat the offer from Dynamics Corp. as withdrawn and replaced by a subsequent competing offer.

The second deal is between Sovereign Bancorp and Flagship Financial Corp. (Deal Number: 239981020). The discussion regarding a possible business combination between the two parties was terminated on August 20, 1991, citing an inability to make significant progress in a timely manner.[16] Soon after, in December 1991, Sovereign announced that it had commenced merger discussions with Flagship. However, on January 17, 1992, Sovereign announced that Flagship had received a proposal from another bidder, and it could not significantly improve its offer and thus terminated discussions with Flagship.[17] Considering the entire bidding cycle, I classify the deal into Reason ii. Subsequent competing offers.

There is one case that I classify into a category seemingly unrelated to competing bids. Zions Bancorp and First Security Corp. announced a merger (Deal Number: 889315020) on June 6, 1999. However, Zion's investment advisor, Goldman Sachs, withdrew its support of the merger on March 13, 2000. On March 31, Zions' shareholders voted against the deal, and it fell apart the following day.[18] Because the media search reveals no evidence of a subsequent competing offer, I classify the deal as withdrawn due to acquirer-side skepticism.

[13] "LIONEL TERMINATES AGREEMENT TO SELL DALE ELECTRONICS STAKE," Dow Jones Newswires, July 5, 1984.

[14] "Dynamics Corp. signs agreement concerning Lionel's Dale Electronics stock," Business Wire, December 10, 1984; "Reorganization Plan by Lionel," The New York Times, September 13, 1985.

[15] United Press International, September 20, 1985; "Dale Electronics By Reuters," The New York Times, November 2, 1985.

[16] "Sovereign confirms termination of discussions with Flagship," Business Wire, August 20, 1991.

[17] "Sovereign focusing on other growth opportunities," Business Wire, January 17, 1992.

[18] "Zions, First Security Deal Dies," The Daily Deal, April 2, 2000.

3.3. Unexpected Target Developments

Unexpected target-driven merger failures can serve as plausibly exogenous events in studies of post-merger acquirer outcomes. In addition to regulatory disapproval and subsequent competing offers, Savor and Lu (2009) consider unexpected target developments to be orthogonal to acquirer valuation. However, this category is also subject to multiple interpretations, leading to discrepancies and potential misclassifications. For example, Salant Corp. abandoned its proposed acquisition of Farah Inc. (Deal Number: 103193020) in May 1989. Before Salant decided not to proceed with its $11-a-share offer, it threatened to reduce the offer if Farah sold its Generra division.[19] Another example is the planned merger between Medco Research Inc. and Repligen Corp. (Deal Number: 469611020), which fell apart in July 1995. The two companies could not agree on a new valuation of Repligen.[20] I view these deals as failed mergers due to disagreement over valuation, whereas under the SL classification, they are attributed to information revealed during due diligence about the targets.

In the provided classification, three deals are considered mergers that collapsed after negative earnings surprises at the targets. However, I find that they failed because of endogenous reasons, such as disagreement over valuation and a fall in the acquirer's stock price. For example, IDB Communications Group lowered its original offer (Deal Number: 401100020) because Peoples Telephone Company's first-quarter earnings were lower than expected. Peoples Telephone responded that the revised offer was unacceptable, and the two companies terminated the letter of intent in May 1994.[21] I see that this deal failed because of disagreement over the valuation of the target. By contrast, Savor and Lu (2009) attribute the collapse of the deal to a negative earnings surprise at the target, which is also a valid interpretation. Another example is the deal between Covance Inc. and Parexel International Corp. (Deal Number: 876822020). They agreed to end their planned merger on June 25,

[19] "Farah says Salant drops its $64.8M buyout offer," Women's Wear Daily, May 8, 1989.
[20] "Repligen/Medco merger called off," Biotechnology Business News, July 21, 1995.
[21] "Peoples calls off IDB deal," United Press International, May 10, 1994; "IDB Communications acknowledges acquisition of Peoples Telephone Company is terminated," Business Wire, May 10, 1994.

1999, because Covance, the acquirer, had seen its stock price fall by 13 percent since the deal was announced on April 29, 1999. Parexel's stock had also been under pressure, which the SL classification attributes to a negative earnings surprise at the target. However, I find no evidence supporting this.[22] I therefore assign this deal to Reason x. Fall in acquirer's stock price instead of Reason xix. Negative earnings surprise at target. These cases once again underscore the nontrivial nature of classifying failed mergers, including those driven by unexpected target developments.

Six deals are assigned to the category of unexpected target developments under my classification, whereas Savor and Lu (2009) classify them as endogenously failed mergers. For example, Flexi-Van Corp. abandoned its plan to acquire Seaboard World Airlines (Deal Number: 689942020) on July 3, 1979, citing the receipt of a new study about the future of the air cargo business over the North Atlantic and the rapid deterioration in world oil supplies.[23] Another example is the merger agreement between Parker & Parsley Petroleum Company and Tide West Oil Company (Deal Number: 427284020), which was terminated on January 17, 1995, due to a recent decline in natural gas prices.[24] I assign these deals to Reason xxiii. Development in target's industry. By contrast, the SL classification attributes them to macroeconomic conditions. Both classifications can be defensible, depending on where one draws the boundary between industry-specific and macro-level developments.

4. Estimating the Treatment Effects of Acquisitions

My findings so far show that because classifying failed mergers relies on subjective judgment, discrepancies across researchers are unavoidable. Classification also depends on researchers' ability to locate and retrieve relevant news articles. I acknowledge that some of

[22] "COVANCE AND PAREXEL CANCEL THEIR MERGER," The New York Times, June 26, 1999.

[23] "Flexi-Van ends plan to acquire Seaboard lines," The Globe and Mail, July 4, 1979.; The Wall Street Journal, July 5, 1979.

[24] "Parker & Parsley and Tide West Oil Co. terminate merger agreement," Business Wire, January 17, 1995.

the observed discrepancies may be attributable to misclassifications in my data, if any exist. Later in this section, I measure the performance of stock-financed acquirers using my data as a sample test to examine how the results vary depending on the chosen counterfactual. Here, I clarify that my primary goal is not to support or refute the market-timing theory of acquisitions (Shleifer and Vishny, 2003; Rhodes-Kropf and Viswanathan, 2004), but rather to discuss potential bias introduced by using failed merger bids.

4.1. Average Treatment Effect and Causal Inference

The purpose of the quasi-experimental design discussed thus far is to isolate the treatment effects of mergers and acquisitions. Therefore, I begin by discussing the average treatment effect (ATE) and the selection bias that complicates its estimation from the acquirer's perspective. The algebraic representation of it is:

$$ATE_i = E[y_i(C = 1) - y_i(C = 0)], \tag{1}$$

where $y_i(C = j)$ is the outcome of firm i. $j = 1$ ($j = 0$) indicates that firm i does (does not) acquire a target. However, we can only observe the difference in the average outcome between successful and unsuccessful acquirers (or stand-alone firms), $E[y_i(1)|C = 1] - E[y_i(0)|C = 0]$, which can be rewritten as:

$$\begin{aligned} E[y_i(1)|C = 1] - E[y_i(0)|C = 0] = {} & E[y_i(1)|C = 1] - E[y_i(0)|C = 1] \\ & + \underbrace{E[y_i(0)|C = 1] - E[y_i(0)|C = 0]}_{\text{selection bias}}. \end{aligned} \tag{2}$$

$E[y_i(0)|C = 1]$ on the right-hand side of Equation (2) represents the average outcome of successful acquirers had they not acquired their targets, which is not observable. $E[y_i(0)|C = 1] - E[y_i(0)|C = 0]$ thus represents selection bias because there may be systematic differences in both observable and unobservable characteristics between firms that choose to pursue acquisitions and those that do not. This introduces bias in the estimated average treatment effect when simply comparing successful and unsuccessful acquirers, as in Equation (2). For example, firms with strong incentives to fully utilize their technologies may generate more innovations even without technological synergies from mergers, relative to firms that lack such incentives and thus do not pursue or complete mergers. In this case, selection bias in the estimated effect of mergers on innovation is positive, i.e., $E[y_i(0)|C = 1] - E[y_i(0)|C = 0] > 0$, leading to an upward bias in the left-hand side of Equation (2).

Selection bias can be mitigated by leveraging quasi-random assignment of firms to mergers and non-merger counterparts, leading to $E[y_i(0)|C = 1] \approx E[y_i(0)|C = 0]$. To this end, Savor and Lu (2009) and many other studies use the average outcomes of bidders (or their targets) that failed for exogenous reasons as counterfactuals, $E[y_i(0)|C = 0]$, to infer how successful acquirers (or their targets) would have performed if the acquisitions had failed. If quasi-random assignment between successful and exogenously failed mergers holds, then $E[y_i(0)|C = 1] - E[y_i(0)|C = 0] \approx 0$. As a result, the right-hand side of Equation (2) simplifies to $E[y_i(1)|C = 1] - E[y_i(0)|C = 1]$, representing the average treatment effect of M&As on successful acquirers (or their targets).

In line with efforts to mitigate selection bias through random assignment, a regression discontinuity design based on close-call votes is another good example. This identification strategy estimates the treatment effects of shareholder proposals or corporate governance changes passed by a narrow margin, typically just above 50%. In this setting, the average outcome of firms that adopt marginally passed proposals corresponds to $E[y_i(1)|C = 1]$, and that of firms that reject marginally defeated proposals corresponds to $E[y_i(0)|C = 0]$. Due to quasi-random assignment of "pass" and "fail" around the 50% threshold, $E[y_i(0)|C = 1] - E[y_i(0)|C = 0] \approx 0$. However, the assumption of randomness in close-call vote outcomes is questioned by Bach and Metzger (2018), who point to potential managerial influence on the results.

4.2. Value Creation from Stock-Financed Acquisitions

To assess how different data and counterfactuals affect the estimated treatment effects of acquisitions, I measure the performance of successful stock-financed acquirers relative to unsuccessful ones, following Savor and Lu (2009), as an illustrative exercise. The sample covers announcement dates from 1978 to 2020. I examine the three years following each firm's merger announcement and restrict the sample to stock-financed bids. Acquirers that engaged in another bid during the previous three years are excluded from the sample.

Table 4 reports the summary statistics. *ME* denotes firm size, calculated as the market value of equity two trading days before the merger announcement (three or four trading days if unavailable). The book value of equity is computed as in Savor and Lu (2009), following Cohen, Polk, and Vuolteenaho (2003). The market is assumed to get access to financial statement information 4 months after a fiscal year ends, and I ensure that book values reflect the latest data available to the public. B/M denotes the book-to-market ratio, computed as the book value of equity divided by market capitalization at the end of the month preceding the merger announcement (or two months prior if unavailable). $BHAR_{-\mathrm{m},+\mathrm{n}}$ is the buy-and-hold abnormal return, computed relative to a benchmark portfolio matched on size, book-to-market, and two-digit SIC industry, over the (–m, +n) event window around the merger announcement date. *MOM* denotes momentum, measured as the buy-and-hold return for the 12 months prior to the merger announcement. Ratio denotes the ratio of the target's market capitalization, measured at the end of the month preceding the merger announcement (or two months prior if unavailable), to that of the acquirer.

[Table 4 here]

My data resemble the SL data (Table IV of Savor and Lu (2009)) in many respects. Acquirers have lower book-to-market ratios than targets. Acquirers experience higher returns than targets in the year preceding mergers, as reflected in higher momentum. Announcement returns for acquirers are negative, whereas targets experience positive returns. Book-to-market ratios are lower for successful acquirers than for unsuccessful ones. Failed acquirers attempt to acquire relatively larger targets, as evidenced by higher ratios.

Table 5 reports buy-and-hold abnormal returns for stock-financed acquirers following the merger announcement. Columns (1) and (2) report results from Table IV of Savor and Lu (2009), with differences and t-statistics multiplied by –1 to express successful acquirers' performance relative to unsuccessful acquirers. Columns (3) and (4) report results based on my data. Successful acquirers experience significantly negative returns over the next 750 trading days after the announcement. The mean abnormal return declines from –2.8% to –22.6% in Columns (3) and (4) of Panel A. Failed acquirers perform worse. Their mean abnormal return declines from –2.4% to –35.4% in Columns (3) and (4) of Panel B. As a result, successful stock bidders outperform unsuccessful ones by 12.8% over the three years following the announcement. I find similar results for endogenously failed stock bidders in Columns (3) and (4) of Panel C. Although the performance difference between successful and unsuccessful stock bidders is smaller than in the SL results, stock-financed deals still appear to create value for long-term shareholders. Failed acquirers exhibit similar long-run performance in both results. The weaker long-run performance of successful acquirers in my results explains their smaller outperformance relative to unsuccessful bidders.

[Table 5 here]

Panels B and C include deals that failed for reasons related to acquirer valuation. Therefore, the observed difference in average performance between successful and unsuccessful stock-financed acquirers is, to some extent, biased due to endogeneity in managerial decisions regarding whether to proceed with mergers. In other words, $E[y_i(0)|C=1]-E[y_i(0)|C=0]$ is nonzero in Equation (2) and is predicted to be positive if the mispricing of stock bidders that failed for valuation-related reasons is revealed earlier. To estimate the treatment effects of M&As on shareholder value, I need a control group whose performance can proxy for how acquirers would have performed without mergers. To this end, Panel D includes only failed mergers resulting from regulatory disapproval, subsequent competing offers, or unexpected target developments, all of which are considered orthogonal to acquirer valuation. I find that exogenously failed acquirers also experience significantly negative returns, declining from –1.8% to –34.9% over the three-year horizon. Although they do not significantly underperform successful acquirers, the relative outperformance of successful acquirers remains similar in magnitude, because exogenously failed acquirers in Panel D perform similarly to those in Panels B and C. On the other hand, in the SL results, exogenously failed acquirers experience substantially more negative returns, declining from –4.5% to –44.2%. This widens the long-run performance gap between Panels A and D to 31.2%.

Panel E further restricts the counterfactual by excluding deals that failed due to unexpected target developments. I find that stock bidders whose bids failed due to regulatory disapproval or subsequent competing offers do not experience significantly negative long-run returns after negative announcement returns. Moreover, their performance is comparable in magnitude to that of successful stock bidders. This suggests that, in my data, stock bidders with and without the M&A treatment exhibit similar performance when withdrawals are driven by exogenous factors, in contrast to the findings in Savor and Lu (2009). In the SL results, restricted exogenously failed acquirers continue to perform significantly worse than successful acquirers, by 27% in the long run. This provides evidence that empirical results are sensitive to the data employed in the quasi-experimental approach using classified failed bids. As mentioned in the previous section, only 189 of the 615 withdrawn bids in my data appear in the shared data.

As mentioned in the previous section, only 189 of the 615 withdrawn bids in my data appear in the shared dataset, despite following all the procedures described in Savor and Lu (2009).[25] Moreover, among these, I identify 48 discrepancies that are concentrated in

[25]This underscores the importance of disclosing not only data but also code for research reproducibility, which was not required at the time and has become mandatory only recently in leading journals.

cases involving competing bids, as reported in Table 3. However, rather than attributing the different results solely to differences in data and, to a lesser extent, code, I explore whether more substantive insights can be drawn from them.

4.3. Subsample Analysis of Value Creation from Stock-Financed Acquisitions

To explore the source of the weaker results, particularly when focusing on exogenous failures, Table 6 reports buy-and-hold abnormal returns for bidders that failed for similar reasons (Panels B–J, ordered from worst to best) and for successful acquirers (Panel A). Acquirers that failed for acquirer-side reasons (Panel B), unexpected market conditions or legal actions (Panel C), or disagreement between the parties (Panel D) perform the worst. Their average three-year abnormal returns lie between –57.2% and –55.6%. Most of these acquirers failed for reasons directly related to acquirer valuation, such as disagreement over valuation and a fall in the acquirer's stock price. Failed acquirers due to unexpected target developments (Panel E) follow, with a mean three-year abnormal return of –48.1%.

[Table 6 here]

The remaining failed acquirers exhibit substantially less negative abnormal returns. Acquirers that failed due to either subsequent (Panel H) or non-subsequent competing offers (Panel J) exhibit statistically insignificant abnormal returns. Bidders rejected by targets show a three-year abnormal return of –17.6% in Panel I. Failed acquirers facing regulatory disapproval or an inability to conclude negotiations show similar three-year abnormal returns of –29.9% and –26.1% in Panels F and G, respectively. These results suggest that, in terms of stock performance, failed deals driven by conventional exogenous reasons are similar to those driven by common endogenous reasons (Panels F–J). Figure 1 depicts the similarity between these groups. Endogenous Subsample 1 includes withdrawn bids in Panels G, I, and J. Exogenous Subsample 1 includes withdrawn bids in Panels F and H. Endogenous Subsample 1, along with its confidence intervals, exhibits stock performance similar to that of both the successful sample and Exogenous Subsample 1 over time. This helps explain why the estimated relative performance between successful and exogenously failed acquirers is modest and becomes even weaker when the counterfactual is restricted to regulatory disapproval or subsequent competing offers in Panel E of Table 5.

[Figure 1 here]

Endogenous Subsample 2 consists of failed bids driven by acquirer-side reasons (Panel B), unexpected market conditions or legal actions (Panel C), or disagreement between the parties (Panel D of Table 6). Exogenous Subsample 2 consists of failed bids driven by unexpected target developments (Panel E of Table 6). These samples show significantly different performance from Endogenous Subsample 1 after two years. Note that Endogenous Subsample 2, which includes acquirers that failed for valuation-related reasons or for reasons that seemingly affected their valuation, exhibits the most negative performance. These results indicate that exogenously failed bidders assigned to the same broad category can still differ significantly from one another. A group of exogenously failed mergers can instead be similar to a group of endogenously failed mergers, as shown in Figure 1, raising concerns about their use as control firms. I thus examine how the relative performance between treated and control groups varies with the choice of a counterfactual by comparing different subsamples with the successful sample in Table 7.

[Table 7 here]

Panel A restates Columns (3) and (4) in Panel A of Table 5, serving as the treated group. In Panel B, Subsample 1 (2) corresponds to Endogenous Subsample 1 (2) combined with Exogenous Subsample 1 (2) in Figure 1. Subsample 1 in Panels B, C, and D perform similarly to the successful sample in Panel A, resulting in little difference between them, regardless of whether the failure reasons are endogenous or exogenous. By contrast, Subsample 2 in Panels B, C, and D perform significantly worse than the successful sample in Panel A. The successful sample outperforms Subsample 2 in Panels B and C by 31.6–34%. The relative outperformance declines to 25.5% when the counterfactual is restricted to failed acquirers attributable to target-side reasons in Panel D, suggesting that $E[y_i(0)|C = 1] - E[y_i(0)|C = 0] > 0$ in this subsample.

In summary, successful stock bidders outperform unsuccessful ones by 12.8% over the three years following the merger announcement (Column (4) in Panel B of Table 5). The outperformance declines to 12.3% and becomes statistically insignificant when the counterfactual consists only of mergers that failed for conventional exogenous reasons (Column (4) in Panel D of Table 5). The outperformance increases to 25.5% when failed mergers driven by regulatory disapproval or subsequent competing offers are excluded (Column (4) of Panel D in Table 7), as these cases complicate estimation by performing similarly to common endogenous failures such as target refusal. My findings show that successful stock-financed acquirers do not create value for shareholders relative to bidders that failed due to regulatory disapproval or difficulties in bidding or negotiations (Subsample 1). However, focusing on failed mergers driven by explicitly acquirer- or target-related reasons leads to the conclusion that successful stock bidders still create value relative to these firms (subsample 2). In other words, successful stock-financed acquisitions create value for long-term shareholders relative to acquisitions that failed exogenously due to unexpected target developments.

5. Discussion

The evidence so far suggests that the effects of M&As documented in the literature may vary depending on who constructs the counterfactual. I find no statistically significant performance difference between successful and failed stock bidders when failure is attributable to exogenous reasons, particularly regulatory disapproval and subsequent competing offers.

In Section 3, discrepancies between the SL classification and mine are concentrated in deals involving competing bids, which may contribute to the different results. However, I also find that those different classifications (e.g., subsequent competing offers versus target refusal) exhibit similar stock performance, raising endogeneity concerns. This implies that even if all exogenous merger failures are correctly classified in line with the literature, some may still be inappropriate as control firms, depending on the research question. Therefore, rather than attributing the different findings to nonidentical data and code, as I also find similar results, these findings highlight the need to reconsider the practice of passively accepting conventional exogenous reasons for failure as a control group when estimating the treatment effects of acquisitions.

5.1. Nonrandom Assignment to Exogenous Merger Failure

I find similar post-announcement performance between unsuccessful acquirers that failed for representative exogenous reasons, regulatory disapproval or subsequent competing offers (Exogenous Subsample 1), and those that failed for common endogenous reasons, such as target refusal and non-subsequent competing offers (Endogenous Subsample 1). Regulatory disapproval and subsequent competing offers are widely regarded in the literature as exogenous reasons for failure. However, the observed similarity between Exogenous Subsample 1 and Endogenous Subsample 1 raises questions about their suitability as control firms, at least in estimating value creation from stock-financed acquisitions. Moreover, there is limited justification for treating these failures as exogenous, especially in the case of subsequent competing offers, as opposed to non-competing offers, for example. Firms usually have the option to proceed or withdraw when other companies intervene in bidding. For example, Sovereign Bancorp decided not to improve its original $11.50-a-share offer in response to the higher bid from PNC Financial Corp. (Deal Number: 239981020).[26] Since Sovereign already suggested its fair offer, it did not proceed with a higher offer, indicating that there was

[26] "PNC to Pay $45 Million For Flagship Financial," American Banker, January 22, 1992.

endogenous consideration leading to the withdrawal. This consideration is common among firms facing competing offers, irrespective of whether they are original or late bidders. Note that subsequent competing offers are not treated as an exogenous factor in the recent studies reported in Table 2.

When firms face regulatory hurdles, they still have the option to continue with the merger, as regulators sometimes grant conditional approval if the firms agree to divest certain businesses or assets. For example, Affiliated Bankshares was first asked by the Federal Reserve Board to sell two banks to complete the deal with IntraWest Financial Corp. (Deal Number: 95325020).[27] In this situation, the firm chooses its best response. If the best response is withdrawal, the decision cannot be considered exogenous, even if it is influenced by regulatory intervention. Li and Wang (2023) also note that withdrawn bids due to antitrust reasons are not appropriate control firms in their setting. Acquirers and their potential targets may discourage their inventors from working together to avoid additional scrutiny following regulatory disapproval, which can affect the outcome of interest, namely the productivity of acquirer and target inventors.

No merger failure can be regarded as exogenous to the same degree as in a randomized experiment. Therefore, within the quasi-experimental approach, the best we can do is to construct a counterfactual consisting of firms that are assumed to be less affected by endogenous selection into merger failure. To this end, I restrict the counterfactual to failed acquirers driven by unexpected target-side reasons, which are largely unrelated to acquirer valuation under correct classification. Although narrowing the counterfactual may lead to a Type II error (i.e., falsely rejecting an exogenously failed merger), it helps prevent a Type I error (i.e., falsely classifying an endogenously failed merger as exogenous), which directly contaminates the control group and biases the treatment effects of M&As.

[27] "Affiliated Bankshares, Intrawest Financial Kill Merger Plans," American Banker, October 28, 1985.

5.2. *Potential Applications of Large Language Models*

Some may question a media search involving human readers and instead suggest using large language models (LLMs) to classify failed deals. Because human classification is time-consuming and involves subjective judgment, researchers may consider using an LLM to categorize withdrawn bids in a more cost-effective and potentially less biased manner.

Using LLMs for this type of task is undoubtedly more efficient and time-saving, and it represents an important direction for future research and practice. However, the essence of the classification lies in achieving the precision intended by the classification scheme, rather than efficiency, because the goal is to construct a counterfactual less exposed to endogeneity concerns. Moreover, because LLMs are non-deterministic and continually updated, the same prompt run on the same model may yield different outputs each time. Even if an LLM is eventually designed to produce consistent outputs, human intervention is still necessary to evaluate them. At a minimum, benchmark data collected by researchers are required to validate LLM-based classifications (Ludwig, Mullainathan, and Rambachan, 2025).

Taken together, although imperfect, direct human reading supported by appropriate domain expertise remains perhaps the most precise method of classifying texts (Ash and Hansen, 2023; Hansen, Lambert, Bloom, Davis, Sadun, and Taska, 2023). Even when using an LLM, some researcher-verified data are still required for validation. Labeling all documents becomes too costly in terms of time and money when the dataset is large. Following the criteria in the literature, however, I examine 625 valid but failed deals through 2020, and the total is still under 800 to date. Since the sample is not exceptionally large, media searches for withdrawn bids are manageable, allowing researchers to conduct cross-validation using their own classifications.

6. Concluding Remarks

The assumption of random assignment between merger completion and exogenous merger failure underlying the quasi-experimental design has been widely accepted in the literature, despite little explicit scrutiny. However, all merger failures reflect some degree of self-selection, as they result from firms' decision-making. Therefore, the use of failed acquirers (or their targets) as control firms inherently compromises causal inference. Moreover, the assignment of failed mergers to endogenous or exogenous categories involves substantial judgment. As a result, empirical findings can be heavily influenced by how researchers construct counterfactuals. While undoubtedly novel, the quasi-experimental approach thus has limitations. Unfortunately, researchers must rely on this approach unless a valid instrumental variable or exogenous shock is available, both of which are rare in M&As.[28] Hence, I conclude by offering several suggestions that can help readers better assess estimates of merger effects based on failed bids.

First, carefully select failure categories that are less subject to endogeneity concerns and provide a clear justification for their use. For example, when treating merger failures attributable to subsequent competing offers as exogenous, it is crucial to justify why these failures are more plausibly exogenous than those due to non-subsequent competing offers. Nevertheless, it is important to note that even narrowly defined exogenous failure remains, to some extent, susceptible to endogeneity. Second, demonstrate how restricting the control group to exogenously failed acquirers or targets affects the results. This practice can provide evidence that selection bias is mitigated. A similar practice exists in regression discontinuity design studies based on close-call votes, where researchers test robustness by varying the bandwidth around the cutoff.[29] Third, exogenously failed deals should be disclosed as a low-

[28]In a recent study, Farre-Mensa, Liu, and Nickerson (2022) use a novel instrument to estimate the impact of startup acquisitions on startup inventors' productivity. However, their identification strategy is only applicable to relatively small firms.

[29]For example, Flammer (2015) shows how the abnormal return on the day of the vote for corporate social responsibility proposals changes when further restricting vote shares around the majority threshold.

cost policy that enables the reproducibility of research (Whited, 2023). More importantly, such disclosure enables open discussion of which withdrawn bids are appropriate as counterfactuals and facilitates cross-validation among researchers, regardless of the classification methods–manual or LLM-based–thereby guiding future research.

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Figure 1. Acquirer Buy-and-Hold Abnormal Returns by Subsample

This figure presents buy-and-hold abnormal returns for acquirers following merger announcements. “Successful Sample” corresponds to Panel A of Table 7. “Endogenous Subsample 1” (with 95% confidence intervals) and “Endogenous Subsample 2” correspond to Subsample 1 and Subsample 2 in Panel C of Table 7, respectively. “Exogenous Subsample 1” and “Exogenous Subsample 2” correspond to Subsample 1 and Subsample 2 in Panel D of Table 7, respectively. “Endogenous Subsample 1” includes withdrawn bids that failed due to an inability of conclude negotiations, target refusal, or non-subsequent competing offers. “Endogenous Subsample 2” includes withdrawn bids that failed due to acquirer-side reasons, unexpected market conditions or legal actions, or disagreement between the parties. “Exogenous Subsample 1” includes withdrawn bids that failed due to regulatory disapproval or subsequent competing offers. “Exogenous Subsample 2” includes withdrawn bids that failed due to unexpected target developments.

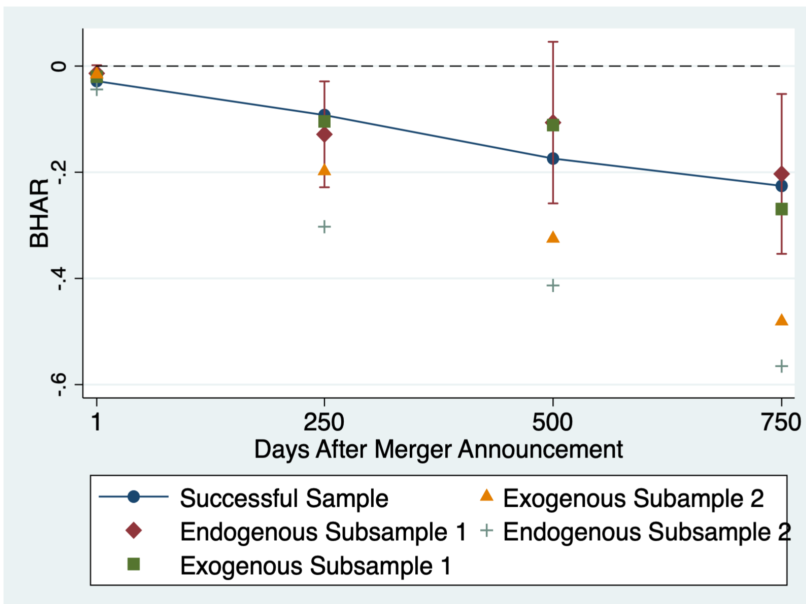

Table 1. Reasons for Failed Mergers, 1978–2020

This table presents the reasons for withdrawal for 615 failed mergers between 1978 and 2020, along with their modes of payment. Further details are provided in Section 2.

Reason	Mode of Payment		
	Stock Only	Mixed	Cash Only
i. Regulatory disapproval (mostly due to antitrust concerns)	19	25	16
ii. Subsequent competing offers	25	22	24
iii. Unexpected/adverse macroeconomic/market conditions	9	10	3
iv. Unexpected legal actions	3	3	3
v. Target's refusal	47	33	64
vi. Disagreement over valuation	25	5	6
vii. Difference in opinion over growth strategy	3	2	2
viii. Disagreement over restructuring, including top personnel matters (e.g., board composition)	7	0	2
ix. Inability to conclude negotiations	42	14	14
x. Fall in acquirer's stock price	10	5	0
xi. Increase in acquirer's stock price	1	0	0
xii. Problems in acquirer's operations revealed over the course of negotiations	3	3	0
xiii. Bad market reception / Acquirer-side skepticism	19	10	8
xiv. Acquisition of the bidder	7	5	1
xv. Acquirer's inability to obtain financing	1	3	3
xvi. Fall in target's stock price	2	0	0
xvii. Worsening conditions in target's operations	5	0	2
xviii. Rating agency downgrade of target	1	0	0
xix. Negative earnings surprise at target	7	1	1
xx. Due diligence revelation about target	6	1	5
xxi. Restatement of target's results	3	1	0
xxii. Increase in target's valuation	0	0	1
xxiii. Development in target's industry	3	0	3
xxiv. Non-subsequent competing offers	17	12	35
xxv. Not enough information / negotiations not completed	0	2	0
Total	265	157	193

Table 2. Exogenous Reasons for Merger Failure in the Literature

This table provides examples of exogenous reasons for merger failure used in the literature and the post-merger firm outcomes that are investigated. Reason i is regulatory disapproval. Reason ii is subsequent competing offers. Reason iii is unexpected/adverse macroeconomic/market conditions. Reason iv is unexpected legal actions. Reason xiv is an acquisition of the bidder. Reason xv is the acquirer's inability to obtain financing. Reasons xvi–xxiii are unexpected target developments. Further details are provided in Section 2.

Paper	Savor and Lu (2009)	Bena and Li (2014)	Seru (2014)	Li and Wang (2023)	Ma, Ouimet, and Simintzi (2025)
Firm Outcome	Acquirer's Abnormal Return	Innovation Output			Target's Labor Demand
Reason					
i	√	√	√	√	√
ii	√	√	√		
iii		√	√	√	
iv			√		
xiv					√
xv				√	
xvi–xxiii	√				

Table 3. Examples of Discrepancies

This table reports 48 failed mergers for which Savor and Lu's (2009) classification (SL Classification) and my classification assign different reasons for failure. Further details on these deals are provided in Section 3.

Deal	Date	Date		Reason for Failure	
Number	Announced	Withdrawn	Mode	SL Classification	My Classification
153475043	9/27/83	11/20/84	Mixed	Regulatory disapproval	Inability to conclude negotiations
598009020	10/21/96	4/7/97	Mixed	Regulatory disapproval	Disagreement over valuation
1010766020	5/30/00	8/28/00	Stock	Regulatory disapproval	Unexpected legal actions
95325020	4/5/84	10/24/85	Stock	Negative earnings surprise at target	Regulatory disapproval
602312020	11/4/96	3/18/97	Stock	Restatement of target's results	Regulatory disapproval
1043771020	11/2/00	5/2/01	Cash	Acquisition of the bidder	Regulatory disapproval
692470020	9/12/80	1/11/81	Cash	Subsequent competing offers	Target's refusal
150514043	7/30/81	8/1/81	Stock	Subsequent competing offers	Non-subsequent competing offers
150539043	8/6/81	8/31/81	Stock	Subsequent competing offers	Non-subsequent competing offers
152989043	6/27/83	7/21/83	Mixed	Subsequent competing offers	Non-subsequent competing offers
95207020	8/16/85	8/16/85	Stock	Subsequent competing offers	Target's refusal
115306020	11/21/85	12/30/85	Cash	Subsequent competing offers	Non-subsequent competing offers
101237020	4/8/86	4/29/86	Cash	Subsequent competing offers	Non-subsequent competing offers
26065020	5/27/86	10/1/86	Stock	Subsequent competing offers	Target's refusal
22726020	9/22/86	9/29/86	Cash	Subsequent competing offers	Non-subsequent competing offers
15084020	10/8/86	11/4/86	Stock	Subsequent competing offers	Target's refusal
22707020	12/29/86	1/5/87	Cash	Subsequent competing offers	Non-subsequent competing offers
24485020	3/11/87	3/30/87	Cash	Subsequent competing offers	Non-subsequent competing offers
106771020	11/17/88	6/23/89	Stock	Subsequent competing offers	Non-subsequent competing offers
125629020	8/14/89	9/21/89	Stock	Subsequent competing offers	Non-subsequent competing offers
126126020	8/25/89	9/18/89	Stock	Subsequent competing offers	Target's refusal
207620020	5/20/91	9/13/91	Stock	Subsequent competing offers	Non-subsequent competing offers
526139020	1/22/96	9/18/96	Mixed	Subsequent competing offers	Target's refusal
614658020	12/9/96	3/10/97	Stock	Subsequent competing offers	Non-subsequent competing offers

Continued

Table 3 — *Continued*

643892020	2/21/97	4/21/97	Mixed	Subsequent competing offers	Non-subsequent competing offers
703125020	10/15/97	11/10/97	Cash	Subsequent competing offers	Non-subsequent competing offers
706474020	10/30/97	11/26/97	Stock	Subsequent competing offers	Target's refusal
733735020	2/17/98	3/23/98	Stock	Subsequent competing offers	Non-subsequent competing offers
889315020	6/6/99	4/2/00	Stock	Subsequent competing offers	Bad market reception / Acquirer-side skepticism
95161020	2/27/84	9/19/85	Cash	Target's refusal	Subsequent competing offers
239981020	3/1/91	1/17/92	Mixed	Target's refusal	Subsequent competing offers
103193020	3/14/89	5/4/89	Cash	Due diligence revelation about target	Disagreement over valuation
305982020	10/28/92	12/10/92	Stock	Due diligence revelation about target	Unexpected legal actions
401100020	4/21/94	5/10/94	Stock	Negative earnings surprise at target	Disagreement over valuation
423157020	9/2/94	10/4/94	Cash	Restatement of target's results	Target's refusal
469611020	5/23/95	7/11/95	Stock	Due diligence revelation about target	Disagreement over valuation
605314020	11/11/96	3/20/97	Stock	Fall in target's stock price	Inability to conclude negotiations
876822020	4/29/99	6/25/99	Stock	Negative earnings surprise at target	Fall in acquirer's stock price
898815020	6/28/99	9/7/99	Cash	Due diligence revelation about target	Inability to conclude negotiations
962638020	1/18/00	2/8/00	Stock	Negative earnings surprise at target	Inability to conclude negotiations
1031116020	7/31/00	3/30/01	Mixed	Due diligence revelation about target	Inability to conclude negotiations
1038199020	8/17/00	9/26/00	Stock	Due diligence revelation about target	Increase in acquirer's stock
689942020	5/21/79	7/3/79	Cash	Unexpected/adverse macroeconomic/market conditions	Development in target's industry
150187043	3/9/81	5/27/81	Stock	Not enough information / negotiations not completed	Negative earnings surprise at target
150481043	7/28/81	11/24/81	Mixed	Target's refusal	Negative earnings surprise at target
97865020	11/12/84	1/15/85	Stock	Inability to conclude negotiations	Restatement of target's results
385209020	1/13/94	4/21/94	Cash	Acquirer's inability to obtain financing	Due diligence revelation about target
427284020	9/20/94	1/17/95	Stock	Unexpected/adverse macroeconomic/market conditions	Development in target's industry

Table 4. Summary Statistics

This table provides summary statistics for acquirers and targets involved in stock-financed bids. Panel A includes all stock-financed bids that were completed. Panel B includes all stock-financed bids that were withdrawn. Panel C contains withdrawn stock-financed bids that failed for endogenous reasons. Panel D contains withdrawn stock-financed bids that failed for exogenous reasons including unexpected target developments. Panel E contains withdrawn stock-financed bids that failed for restricted exogenous reasons, which are regulatory disapproval and subsequent competing offers. *ME* denotes firm size. B/M denotes book-to-market. $BHAR_{-1,+1}$ is an abnormal return over an (–1, +1) event window around a merger announcement date. *MOM* denotes momentum. Ratio indicates the ratio of the target's market capitalization to that of the acquirer. Further details of the variables are provided in Section 4.2.

	Acquirers				Targets				
	ME	B/M	$BHAR_{-1,+1}$	*MOM*	*ME*	B/M	$BHAR_{-1,+1}$	*MOM*	Ratio
Panel A: Successful Sample									
Mean	5298.9	0.494	–0.028	0.418	1585.5	0.644	0.135	0.217	0.384
Median	941.1	0.409	–0.026	0.242	245.3	0.510	0.106	0.143	0.254
N	1,176	1,120	1,092	1,176	1,176	1,044	1,024	1,176	1,176
Panel B: All Failed Sample									
Mean	3511.8	0.516	–0.024	0.370	1332.0	0.717	0.111	0.151	0.547
Median	714.6	0.476	–0.023	0.207	218.5	0.553	0.079	0.031	0.378
N	220	206	201	220	220	194	187	220	220
Panel C: Endogenous Failed Sample									
Mean	2122.4	0.525	–0.027	0.386	1119.1	0.706	0.108	0.167	0.577
Median	690.9	0.488	–0.018	0.233	194.8	0.531	0.067	0.017	0.380
N	158	145	140	158	158	137	135	158	158
Panel D: Exogenous Failed Sample									
Mean	7052.5	0.493	–0.018	0.330	1874.4	0.745	0.119	0.110	0.473
Median	757.9	0.437	–0.030	0.189	299.7	0.583	0.080	0.072	0.357
N	62	61	61	62	62	57	52	62	62
Panel E: Restricted Exogenous Failed Sample									
Mean	10306.1	0.516	–0.020	0.348	2493.2	0.676	0.105	0.218	0.523
Median	740.3	0.441	–0.030	0.209	370.7	0.606	0.089	0.108	0.481
N	38	38	38	38	38	34	30	38	38

Table 5. Acquirer Buy-and-Hold Abnormal Returns

This table reports announcement and long-term buy-and-hold abnormal returns for stock-financed acquirers. Panel A includes all completed bids. Panel B includes all withdrawn bids. Panel C contains withdrawn bids that failed for endogenous reasons. Panel D contains withdrawn bids that failed for exogenous reasons including unexpected target developments. Panel E contains withdrawn bids that failed for restricted exogenous reasons, which are regulatory disapproval and subsequent competing offers. $BHAR_{-\mathrm{m},+\mathrm{n}}$ is an abnormal return over an (–m, +n) event window around a merger announcement date. Columns (1) and (2) report results from Table VI of Savor and Lu (2009), with differences and t-statistics multiplied by –1. Columns (3) and (4) report my results. t-statistics are in brackets. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Savor and Lu (2009)			
	(1)	(2)	(3)	(4)
	$BHAR_{-1,+1}$	$BHAR_{-1,+750}$	$BHAR_{-1,+1}$	$BHAR_{-1,+750}$
		Panel A: Successful Sample		
Mean	–0.033***	–0.131***	–0.028***	–0.226***
	[–11.70]	[–3.88]	[–11.59]	[–7.20]
N			1,092	1,087
		Panel B: All Failed Sample		
Mean	–0.044***	–0.338***	–0.024***	–0.354***
	[–6.59]	[–6.07]	[–4.16]	[–6.29]
N			201	201
Panel A – B	0.011	0.207***	–0.004	0.128**
	[1.56]	[3.18]	[–0.67]	[1.99]
		Panel C: Endogenous Failed Sample		
Mean			–0.027***	–0.356***
			[–3.98]	[–6.07]
N			140	140
Panel A – C			–0.002	0.130**
			[–0.24]	[1.96]
		Panel D: Exogenous Failed Sample		
Mean	–0.045***	–0.442***	–0.018	–0.349***
	[–4.17]	[–5.08]	[–1.61]	[–2.72]
N			61	61
Panel A – D	0.013	0.312***	–0.010	0.123
	[1.15]	[3.34]	[–0.85]	[0.93]
		Panel E: Restricted Exogenous Failed Sample		
Mean	–0.035***	–0.401***	–0.020*	–0.269
	[–4.18]	[–3.39]	[–1.89]	[–1.39]
N			38	38
Panel A – E	0.003	0.270**	–0.008	0.044
	[0.33]	[2.19]	[–0.76]	[0.22]

Table 6. Acquirer Buy-and-Hold Abnormal Returns by Failure Reason

This table reports announcement and long-term buy-and-hold abnormal returns for stock-financed acquirers. Panel A includes all completed bids. Panel B includes withdrawn bids that failed for acquirer-side reasons, such as a fall in the acquirer's stock price (Reasons x–xv). Panel C contains withdrawn bids that failed due to unexpected market conditions or legal actions (Reasons iii & iv). Panel D contains withdrawn bids that failed due to disagreement between the parties, such as over valuation (Reasons vi–viii). Panel E contains withdrawn bids that failed due to unexpected target developments (Reasons xvi–xxiii). Panel F includes withdrawn bids that failed due to regulatory disapproval (Reason i). Panel G includes withdrawn bids that failed due to an inability to conclude negotiations (Reason ix). Panel H includes withdrawn bids that failed due to subsequent competing offers (Reason ii). Panel I includes withdrawn bids that failed due to target refusal (Reason v). Panel J contains withdrawn bids that failed due to non-subsequent competing offers (Reason xxiv). $BHAR_{-\mathrm{m},+\mathrm{n}}$ is an abnormal return over an (–m, +n) event window around a merger announcement date. t-statistics are in brackets. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1)	(2)	(3)	(4)
	$BHAR_{-1,+1}$	$BHAR_{-1,+250}$	$BHAR_{-1,+500}$	$BHAR_{-1,+750}$
		Panel A: Successful Sample		
Mean	–0.028***	–0.092***	–0.174***	–0.226***
	[–11.59]	[–7.44]	[–9.77]	[–7.20]
N	1,092	1,091	1,090	1,087
		Panel B: Acquirer-Side Reasons (Reasons x–xv)		
Mean	–0.065***	–0.389***	–0.538***	–0.572***
	[–3.68]	[–4.32]	[–5.39]	[–4.73]
N	27	27	27	27
		Panel C: Unexpected Market Conditions or Legal Actions (Reasons iii & iv)		
Mean	–0.043*	–0.319***	–0.365*	–0.571**
	[–1.90]	[–2.96]	[–1.89]	[–2.18]
N	7	7	7	7
		Panel D: Disagreement between the Parties (Reasons vi–viii)		
Mean	–0.022	–0.204**	–0.293***	–0.556***
	[–1.25]	[–2.47]	[–3.07]	[–3.92]
N	25	25	25	25
		Panel E: Unexpected Target Developments (Reasons xvi–xxiii)		
Mean	–0.016	–0.198***	–0.325***	–0.481***
	[–0.62]	[–2.96]	[–4.35]	[–4.02]
N	23	23	23	23
		Panel F: Regulatory Disapproval (Reason i)		
Mean	–0.028**	–0.145	–0.256**	–0.299**
	[–2.36]	[–1.58]	[–2.32]	[–2.08]
N	16	16	16	16
		Panel G: Inability to Conclude Negotiations (Reason ix)		
Mean	–0.003	–0.099	0.019	–0.261*
	[–0.18]	[–1.23]	[0.12]	[–1.75]
N	31	31	31	31

Continued

Table 6 —*Continued*

Panel H: Subsequent competing offers (Reason ii)				
Mean	–0.014	–0.075	–0.006	–0.248
	[–0.88]	[–0.66]	[–0.03]	[–0.77]
N	22	22	22	22
Panel I: Target's Refusal (Reason v)				
Mean	–0.021***	–0.185**	–0.218**	–0.176*
	[–3.17]	[–2.19]	[–2.39]	[–1.73]
N	37	37	37	37
Panel J: Non-Subsequent Competing Offers (Reason xxiv)				
Mean	–0.017	–0.037	–0.089	–0.141
	[–1.34]	[–0.66]	[–0.93]	[–1.16]
N	13	13	13	13

Table 7. Acquirer Buy-and-Hold Abnormal Returns by Subsample

This table reports announcement and long-term buy-and-hold abnormal returns for stock-financed acquirers. Panel A includes all completed bids. Panel B includes all withdrawn bids. Panel C contains withdrawn bids that failed for endogenous reasons. Panel D contains withdrawn bids that failed for exogenous reasons. Subsample 1 (Panel B) includes withdrawn bids that failed due to an inability to conclude negotiations (Panel C), target refusal (Panel C), non-subsequent competing offers (Panel C), regulatory disapproval (Panel D), or subsequent competing offers (Panel D). Subsample 2 (Panel B) includes withdrawn bids that failed due to acquirer-side reasons (Panel C), unexpected market conditions or legal actions (Panel C), disagreement between the parties (Panel C), or unexpected target developments (Panel D). $BHAR_{-m,+n}$ is an abnormal return over an (–m, +n) event window around a merger announcement date. t-statistics are in brackets. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	(1) $BHAR_{-1,+1}$	(2) $BHAR_{-1,+750}$	(3) $BHAR_{-1,+1}$	(4) $BHAR_{-1,+750}$
	Panel A: Successful Sample			
Mean	–0.028***	–0.226***	–0.028***	–0.226***
	[–11.59]	[–7.20]	[–11.59]	[–7.20]
N	1,092	1,087	1,092	1,087
	Panel B: All Failed Sample			
	Subsample 1		Subsample 2	
Mean	–0.016**	–0.224***	–0.036***	–0.542***
	[–2.53]	[–2.81]	[–3.33]	[–7.73]
N	119	119	82	82
Panel A – C	–0.012*	–0.001	0.008	0.316***
	[–1.87]	[–0.02]	[0.70]	[4.12]
	Panel C: Endogenous Failed Sample			
	Subsample 1		Subsample 2	
Mean	–0.014*	–0.203***	–0.044***	–0.565***
	[–1.79]	[–2.68]	[–3.85]	[–6.58]
N	81	81	59	59
Panel A – B	–0.014*	–0.022	0.016	0.340***
	[–1.79]	[–0.27]	[1.35]	[3.71]
	Panel D: Exogenous Failed Sample			
	Subsample 1		Subsample 2	
Mean	–0.020*	–0.269	–0.016	–0.481***
	[–1.89]	[–1.39]	[–0.62]	[–4.02]
N	38	38	23	23
Panel A – C	–0.008	0.044	–0.013	0.255**
	[–0.76]	[0.22]	[–0.50]	[2.06]