#### Build, Borrow, Buy... or Bail: Divestiture Following M&A Deal Termination

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#### Abstract

The relationship between divestitures and acquisitions is generally presented in three ways: the focal firm makes divestitures to free up resources for future acquisitions; the focal firm divests redundant parts of a target firm they have acquired; or the focal firm may divest an acquired business entirely if the performance of the combined firm does not meet expectations. We theorize an additional relationship—if a bidding firm attempts to acquire a target firm but the transaction fails to close, we predict conditions under which the firm may pivot to divest resources related to the target firm rather than return to the status quo or attempt another mode of growth. To test this relationship, we augment previous methodological approaches with a novel method: matching successful and unsuccessful acquisition bids using the perceived risk of deal failure by using arbitrage spreads between the announced and spot price of the target. Consistent with this argument, we find that bidding firms make more divestitures in sectors related to the target after a failed bid.

#### Keywords

corporate strategy, divestitures, acquisitions, resource reconfiguration, risk arbitrage

Being a profitable, sustaining business was not enough to pass muster. G.E. businesses, [Jack Welch] told securities analysts in his first year on the job, had to be "the No. 1 or No. 2 leanest, lowest-cost worldwide producers of quality goods and services" in their industries. If they weren't, Mr. Welch applied a simple edict: "Fix, sell or close."

Lohr, 2020

A key area of study in corporate strategy is resource reconfiguration; specifically a firm developing or accessing additional resources or conversely diverting or divesting the resources it already controls (Feldman, 2020). A useful framework for the modes by which a firm brings in additional resources is the Build, Borrow, or Buy (BBB) framework, which explores the circumstances under which a firm should choose between internal development, strategic partnerships, or mergers and acquisitions (M&A) (Capron & Mitchell, 2012). Scholars have also explored the methods and motivations for how firms handle resources that are redundant, unnecessary, or no longer sufficiently valuable, whether by redeploying those resources to more productive uses within the firm or divesting of those assets through a selloff or spinoff (Feldman & McGrath, 2016; Feldman & Sakhartov, 2022).

These decisions to either access additional resources or exit through diversion or divestment are not made in isolation, but rather are iterated or alternated as opportunities and threats emerge to tailor a firm's resource position to compete effectively. Extant literature has largely regarded these two as independent decisions, although scholars have more recently studied the temporal links between them. For example, studies have explored how corporate strategy transactions are utilized in a sequence (Feldman, 2020). Scholars have also noted mechanisms by which strategic alliances can presage acquisitions (Zaheer, Hernandez, & Banerjee, 2010). Firms may choose to end strategic partnerships or alliances after completing an M&A transaction (Tandon et al., 2022). Alternatively, a firm may divest resources after the conclusion of an M&A deal, either because of redundancy of resources (Capron et al., 2001) or because the combination does not create the value anticipated (Hayward & Shimizu, 2006; Shimizu, 2007). Resource portfolio dynamics are often framed as a two-staged decision: the focal firm either pursues growth or exit from a given area as the first-stage choice (strategy level), followed by a selection of the specific mode of expansion or contraction (transaction level). For example, assuming a corporate-level decision to invest in growth in a particular product or geographic market, research based on the BBB framework offers predictions or prescriptions for firms choosing the mode of entry (e.g., Borah & Tellis, 2014; Capron, 2016; Cozzolino & Rothaermel, 2018; Lungeanu et al., 2016; Moeen & Mitchell, 2020). For firms that desire a strategic exit from a given resource position, Feldman and Sakhartov (2022) present a corresponding framework for firms exiting by analyzing when firms choose between resource redeployment or divestiture of existing assets in the area.

While previous research has provided valuable insights into resource portfolio dynamics, there is still a gap in understanding how a firm responds when its chosen mode of reconfiguration fails to materialize. Specifically, we investigate the scenario where a firm announces an M&A deal that ultimately does not close (approximately 10 percent of announced large M&A deals fail to reach execution; Bahreini et al., 2019) with the aim of providing a more comprehensive understanding of resource portfolio dynamics by examining both the addition and deletion of resources, as well as the interplay between strategy-level and transaction-level decisions in the context of a firm's response to a failed M&A transaction. When a firm experiences the termination of an intended acquisition, it is intuitive that the firm may pivot to an alternative mode of resource growth, as there is a demonstrated willingness to increase the firm's resource position in that particular industry or product market—indeed, this response would be predicted by the two-stage decision models described above (strategic-level decision to grow followed by the transaction level decision of what method of growth to pursue). We argue that if a focal firm's motivation for the failed M&A deal was to fill a strategic gap for an area in which it has resources already invested, that firm may instead

pivot to exit the current resource position rather than attempt another mode of growth. For example, if the firm already holds complementary resources that would have required the intended target resources to create value, it may react to the deal termination by divesting the business that was to receive the acquired resources.

The central premise of the resource and capability-based view of the firm is that superior performance derives from heterogeneous bundles of valuable resources and capabilities (Barney, 1991; Penrose, 2009; Wernerfelt, 1984) as well as the capability over time to effectively manage, grow, and reconfigure such bundles (Agarwal & Helfat, 2009; Helfat et al., 2007). The differences between the bundles of resources and capabilities leads to firms to value a given resource differently from each other (Argyres & Zenger, 2012) and the different levels of value creation possible with such a resource can explain why some firms are willing to offer a premium to make an acquisition (Wernerfelt, 2011).

We theorize that not only can a focal firm value the desired acquisition target resource more highly than other firms, but the value of the bundle of resources the focal firm already possesses can be dependent on whether or not the acquisition is made. Without the keystone resource sought in the acquisition, the firm's current complementary assets may not create value or may even be valuedestroying. We label such resource bundles "value-contingent resources" (VCRs), a specific type of complementary assets. When the value of the VCRs on their own is insufficient to allow the focal firm to be competitive in the particular market or is insufficient to overcome the opportunity cost of maintaining them, the firm can try to fill the strategic gap or accelerate growth through acquisition. In this case, when the firm's attempt to acquire the desired resource fails, firms may respond by divesting the VCRs and focusing capital and attention on other areas of the corporation<sup>1</sup>. Using Jack

<sup>&</sup>lt;sup>1</sup> The response of a firm with a terminated deal to pivot to divestitures may be particularly pronounced if the missing keystone resource is a "bottleneck resource" (Chang et al., 2022) for the industry. In such a case, there may be less of a

Welch's terminology (Lohr, 2020), if a firm fails to acquire complementary assets to "fix" the business to gain a competitive advantage and become "No. 1 or No. 2" in the industry, it may be more advantageous for the firm to either "sell" the VCRs or "close" the entire business unit through divestiture.

We test this theoretical prediction using a sample of terminated and completed M&A deals among U.S. public firms between 1984 and 2019. We compare firms with a terminated acquisition deal to three control groups: *i*) the previous divestiture activity of the focal firm; *ii*) the post-deal divestiture activity of firms who successfully completed similar acquisitions; and *iii*) the divestiture activity of firms in the focal firm's industry with a comparable propensity to have entered an M&A transaction but which did not. In addition to propensity score matching and coarsened exact matching procedures used by other scholars in this research area, we use an additional measure of deal risk arbitrage to match firms with terminated vs. completed deals. This measure is the relative gap between the offer price for the target's shares and the spot market price in the time after deal announcement but before termination / completion. By comparing deals with similar risk of termination, our study leverages quasi-random variation to isolate firm response to deal failure.

We find that after terminated acquisitions, the bidder is more likely to divest units in industries related to the intended target. This increased propensity to divest target-related units after deal failure exceeds that of firms that completed a similar transaction as well as comparable firms not engaged in an M&A deal. The concentration of such divestitures in industry codes related to the intended acquisition target is consistent with a mechanism of a firm choosing to "bail" after a failed attempt to "buy" the resources of a target firm to address a strategic gap. These findings contribute to the acquisitions and divestiture literature by providing insight and evidence regarding the

chance for the focal firm to pivot to another mode of growth and exit from its current resource position in the market would be relatively more attractive.

sequencing of resource portfolio management. They address a theoretical and empirical gap of how firms respond after a failed M&A, as the focus of the available scholarship is on the effects of completed M&A transactions.

#### THEORY AND HYPOTHESES

Resources and capabilities are key to value creation and having a superior bundle of heterogeneous resources to that of competing firms can be a source of competitive advantage (Penrose, 2009; Wernerfelt, 1984). Moreover, to the extent that a firm can maintain, grow, and manage differentiated and valuable resource positions, it can sustain this advantage (Barney, 1991). In a dynamic competitive environment, firms often need to reorganize or reallocate existing resources, as well as develop or acquire new resources and capabilities to maintain advantage (Eisenhardt & Martin, 2000). This process may be triggered by the recognition of a new opportunity, but also is commonly the result of a salient capability gap (Capron & Mitchell, 2009). In this section, we begin by offering a summary of the Build, Borrow, or Buy framework and resource position exit strategies, which include resource redeployment and divestitures. We synthesize these concepts into a unified resource reconfiguration framework to predict the relationship between terminated acquisitions and subsequent divestiture.

#### Build, Borrow, Buy...

Capron & Mitchell (2012) argue that to sustain growth, a firm needs to add to its available resources; depending on factors including whether the resource is VRIO, whether the resource is tradable and there is a functioning market for it, and the incentive alignment of potential partners, a firm may choose to internally develop the resource (Build), form a strategic partnership or licensing agreement with another firm that already has access to the resource (Borrow), or purchase the resource or acquire a firm that has access (Buy). The focal firm chooses an approach from the BBB generally based on resources available within the firm; the degree of control needed over the new strategic

resource; the availability of counterparties with whom to contract, partner, or acquire; and the extent of incentive alignment / conflict between the focal firm and the counterparty (Capron & Mitchell, 2012). While the BBB framework applies in general to attempts to grow the resources of a firm, the BBB decision is especially crucial when there is a strategic gap or a critical complementary resource the focal firm lacks to unlock the value of its other assets.

If we consider a given non-core business within a firm, we define the following terms:

R(c) = Value of firm assets already supporting the focal business

R(k) = Value of resource to fill the strategic gap (keystone resource)

 $\lambda$  = Synergy between R(c) and R(k)

C(i) = Cost of internal development of the missing resource

C(p) = Cost of strategic partnership (contract / alliance) for the missing resource

C(a) = Cost of acquisition of a target business with the missing resource

The BBB framework would be used to choose the mode of growth conditional on inequality (1), that is, when there is an opportunity to create value from growth.

$$R(c) + R(k) + \lambda(R(c)R(k)) - \min[C(i), C(p), C(a)] > R(c)$$
(1)

Assuming the first-stage strategic decision to grow, then the choice of mode would be that which minimized the cost of the transaction.

The costs of a specific mode are comprehensive and include factors such as time required to implement, counter-party risk, or constraints on the control of the targeted resources. Capron and Mitchell (2012) presented this calculation as a decision tree that evaluated in sequence the feasibility of internal development, contracting/licensing, strategic alliance, and acquisition.

Such sequencing is sensible because in conditions favorable to all three modes, generally C(i) < C(p) < C(a) which corresponds to increasing levels of overall risk. Thus, a well-managed firm choosing to pursue an acquisition suggests that it did not have strong resource and

capability alignment for internal development (or such resources are allocated to better opportunities within the firm); that there is friction or failure in the strategic factor market to contract for or license the targeted resource; and that forming an alliance would not give the focal firm sufficient control over the targeted resource or that it would have significant counter-party risk due to a misalignment of incentives.

If by the end of the decision tree the conditions are also deemed poor for an acquisition, Capron and Mitchell (2012) suggest revisiting the analysis of earlier modes or revising the firm's overall strategy. This recognizes that even though the BBB framework is often depicted as finding the mode of transaction conditional on filling the resource gap, entering, or growing, a fourth option is available to a firm facing a misalignment of resources to the current competitive environment. A firm can choose to Bail, that is, to reallocate or divest itself of the resources whose value is contingent on the missing resource constituting the capabilities gap.

#### ...or Bail

There might be some parts of the business that have conflicting capital requirements (for example a highgrowth business in a cash cow company), and the acquisition could have been designed to bring in resources for growth you didn't want to pull from other efforts. If the deal doesn't materialize, you might spin off the business so that it's no longer brought down by the multiple cap from the parent company. --Practitioner interview

Resource redeployment and divestitures are also key tools in managing a firm's resource portfolio. A firm can choose to reduce resources allocated to a given business within the portfolio by either reallocating them to other businesses (redeployment), selling them to another entity (selloff divestiture), or exiting by establishing the business as a stand-alone firm (spinoff divestiture). Early scholarship on both divestitures and resource reallocation viewed these tools as responses to business failure or as responses to principal/agent concerns such as empire building (see Feldman & McGrath, 2016, for a review). However, for some time strategic management scholars have recognized business exit as a key tool in an overall portfolio strategy, whether as part of an iterative search for optimal resource/environment fit (Matsusaka, 2001), a reactive or proactive move based on changing opportunities and threats from technological innovation (Kaul, 2012), to take advantage of high trading multiples of pure play competitors to the spun-off business (Khorana et al., 2011), or to redefine corporate scope before a subsequent acquisition (Bennett & Feldman, 2017).

While the literature streams of resource redeployment and divestitures have tended to be separate, recent work has explored the tradeoffs in choosing one or the other as a means of exiting a business (Feldman & Sakhartov, 2022). In this vein, a Bail framework could be considered as a complement to the BBB framework in that it is a second-stage choice of action given a first-stage choice to exit.

Continuing the notation from the previous section and defining the following terms: V(r) = Redeployment value of the focal business

V(d) = Divestiture value (selloff or spinoff) of the focal business

the Bail framework would then be used to choose the mode of exit conditional on inequality (2), that is, when there is an opportunity to create value from redeployment or divestiture.

$$max[V(r), V(d)] - R(c) > 0$$
<sup>(2)</sup>

Assuming the first-stage strategic decision to exit, then the choice of mode would be that which maximized the value of the reconfigured resource.

There are often many different potential worthwhile projects in which to invest a firm's capital and attention. Choosing to exit one business can be valuable because it frees up resources and managerial attention. Additionally, there is a different potential value in the transaction mode decision of exit. When resources in the exiting business are related to those needed in other units, they can be redeployed to areas within the firm with more potential for growth (Lieberman et al., 2017). When pure-play competitors of the exiting business are trading at high multiples of their fundamentals, a spinoff or equity carve-out could leverage the beneficent capital markets to unlock

value for current shareholders (Khorana et al., 2011). When the exiting business represents complementary assets to another firm due to its heterogeneous bundle of resources, the premium it may be willing to pay (Wernerfelt, 1984) could make selloff the most valuable form of exit.

Because a firm often is not constrained in the first-stage choice of growth or exit and can weigh one against the other, then there are additional implications to those presented above in equations (1) and (2). In addition to growth being more valuable than the status quo, the BBB framework implies:

$$R(c) + R(k) + \lambda (R(c)R(k)) - min[C(i), C(p), C(a)] > max[V(r), V(d)] - R(c)$$
(3)

the most valuable option for growth is better than the most valuable option for exit. Conversely, in addition to exit being more valuable than the status quo, the Bail framework implies:

$$max[V(r), V(d)] - R(c) > R(c) + R(k) + \lambda(R(c)R(k)) - min[C(i), C(p), C(a)]$$
(4)

the most valuable option for exit is better than the most valuable option for growth.

#### **Resource Portfolio Dynamics**

If we relax the assumption that planning for resource reconfiguration happens as a two-stage process, where first the focal firm decides on growth or exit and then chooses a mode to accomplish this, we can instead assume that savvy managers may instead estimate and rank each of these available modes in a single-stage process. For example, Table 1 below shows a payoff table that includes each of the modes of growth or exit, as well as a status quo option representing the expected value without resource changes. At any particular point in time, a manager could estimate each of these payoffs as a snapshot and create a descending order of value.

There is no constraint that any given option consistently dominates another, so the rankings could be in any order depending on the specific context and drivers of cost or value. For example, a firm may face a situation where the expected payoff structure is *Acquisition* > *Internal Development* > *Status Quo* > *Divestiture* > *Redeployment* > *Alliance* (perhaps incentive alignment is particularly difficult

in the target resource environment). For another firm in another context, the order could be *Internal Development* > *Redeployment* > *Divestiture* > *Alliance* > *Acquisition* > *Status Quo*. The likelihood of a given rank order in a given context is an empirical question informed by the work of many scholars on the specific drivers of value for each transaction mode (see Table 1).

#### [Insert Table 1 about here]

The approach of considering modes of growth or exit as a more holistic menu of options rather than necessarily a staged decision is consistent with other important works that have examined tradeoffs spanning the boundary between growth and exit. The most notable example is Villalonga and McGahan (2005), which presents the choice between acquisition and divestiture as comparable to the choice between alliance and acquisition. Their argument in essence is that a different bundling of resources is anticipated to create more value and that the resources for this bundle initially span firm boundaries; therefore, actions to either bring resources in from another firm to complete the bundle or to send resources out to another firm to complete the bundle could both produce more value than the status quo—and thus can be envisioned together in a continuum of options.

#### **Divestiture after Failed Acquisition**

You have a certain cost structure in the areas you are expanding that you anticipate to be supported by this new growth in the business through acquisition. When the deal falls through and that growth doesn't materialize, then suddenly, you have to decide what to do with those costs, investments, and organizational structure. This might mean bringing in assets from another source, trying to reallocate assets to spur organic growth, or divesting the lower performing assets and restructuring.

--Practitioner interview

Presenting resource reconfiguration decisions as a combined ranked list of expected value choices adds some nuance to explaining or predicting a firm's preference for a transaction mode, but it is even more valuable in understanding how a firm may pivot if an attempted transaction fails. If a firm attempts its first choice and finds that it does not pan out, and if the conditions driving the other payoffs in Table 1 hold, then we would expect a firm to attempt the next best option. For

example, if a firm attempts an acquisition that does not successfully close, the alternative may be to try another form of resource growth, or to stick with the status quo. In this paper, however, we explore cases where the focal firm is more likely to pivot to divest the focal business intended to absorb the target.

Our context is a firm that has a resource position with a strategic gap. The resources the firm currently has deployed in this focal business are missing a complementary resource.<sup>2</sup> More specifically, we are interested in cases where the firm possesses "value contingent resources" (VCRs), which are non-core businesses that, without the addition of the missing complementary resource, are not sufficiently valuable to justify the capital allocation and corporate focus they require.

Using the notation above, VCRs within the focal firm are defined as when:

$$max[V(r), V(d)] > R(c); \text{ and}$$
(5)

$$max[V(r), V(d)] < R(c) + R(k) + \lambda R(c)R(k)$$
<sup>(6)</sup>

Equation 5 represents that the VCRs under the status quo are less valuable to the focal firm than they would be if redeployed or divested. Examples of this condition could be when the resources could be shifted to an area of higher growth within the firm, when the multiples of the focal firm are capping the potential for the VCR business to trade at the higher multiples of comparable pure play businesses, or when another firm may be better positioned to leverage value from the VCR business (perhaps due to possessing a bottleneck resource (Chang et al., 2022)).

Equation 6 represents that if the missing complementary resource were obtained, the focal business would be more valuable to hold internally than to redeploy or divest. The new

<sup>&</sup>lt;sup>2</sup> This missing complementary resource is conceptually similar to "bottleneck resources" described by Chang et al. (2022); however, bottleneck resources were specific to new product market entry and a firm's redeployment of resources into the focal business, while we study situations more broadly where a firm has an existing resource commitment in a focal business that by itself is no longer capable of sustaining the capital and focus allocated to it.

complementary resource would act as a keystone, unlocking the latent value of the VCRs and making the focal business sufficiently competitive. When the cost of gaining this missing resource is less than the difference between the right-hand and left-hand sides of equation 6, we would expect a firm's preference would be to grow; when it is less than the difference, we would expect the preference to be exit instead.

When a firm attempts to bolster a VCR business with an acquisition, we assume that the expected payoff of the "Buy" transaction mode to be higher than that of "Build" or "Borrow." This could be because the other two modes are infeasible (e.g., the firm does not have development capabilities or cannot find a counterparty willing or able to partner) or because the perceived costs such as time to develop or risk of incentive misalignment of potential partners are too great.

When the attempted acquisition fails, the focal firm is generally faced with a shock to C(a)and the expected payoff from this transaction mode is substantially reduced<sup>3</sup>. This could be because of multiple reasons for deal failure, such as a higher competing bid from another firm, inability to get regulatory approval for the deal, or a material change to the underlying economics of the transaction. When facing such deal failure, a firm may try a different form of growth, but we hypothesize that a substantial number of firms choose to divest the focal business instead.

While we cannot consistently observe which business of the focal firm was the intended beneficiary of the acquisition, we use the proxy of proximity to the intended target firm's industry/sector. If we think of the VCR as a non-core business of the bidder that has potential synergy with the core business of the target, industry relatedness between the VCR and the target's core business serves as a proxy for the relative likelihood that the VCR was to be the beneficiary of

<sup>&</sup>lt;sup>3</sup> It is possible that after deal termination, firms will quickly pick another target and attempt another acquisition for the desired resources. In our context, our assumption is that the firm does not have equally attractive options, and thus the shock to C(a) is enough that a pivot to another resource reconfiguration mode is warranted. Empirically, we tested robustness of results with the number of acquisitions of other firms in the target industry to check sensitivity to this assumption.

the intended incoming target resources (as opposed to the bidder's core business or the bidder's other non-core businesses that are not the focal VCR). For example, if a bidder with a core business of pharmaceuticals and a non-core VCR business in cosmetics targets a cosmetics business for acquisition, the bidder's VCR would be more likely to be the anticipated beneficiary of synergies than if the target was from a less related industry. This is important because our theory is not that a bidder with a terminated acquisition will be more likely to divest resources across the entire organization, but rather will focus divestitures on exiting the VCR business specifically.

Hypothesis 1: The bidder will be more likely to divest units in industries/sectors related to the intended target firm after an announced deal is terminated.

#### Moderators to the Baseline Hypothesis

The model predicts that after a failure in the preferred mode of resource reconfiguration, a firm should pivot to the next highest expected value transaction mode. While H1 provides a direct test of whether there are more target area divestitures after an acquisition failure, we should expect that primarily under conditions where divestiture is likely to be the second-best choice on the priority list. This condition provides us with additional testable implications. We should expect fewer pivots to divestiture when the context would support a higher expected value for a different transaction mode, as that other transaction mode would then be more likely to be higher in the rank order of preference and therefore more likely to be the second-best choice above divestiture. We explore the below moderators for the main effect that would affect the likelihood of a firm pivoting to an alternative mode as a substitute for divestiture. The first of these is the resource similarity across the focal firm's operating segments, which can indicate the relative cost/benefit of redeploying resources within the firm.

Related diversification can provide economies of scope by allowing the sharing of complementary resources across product markets when such resources have more capacity than can

be fully utilized by one of the firm's businesses (Montgomery, 1994). In addition to these intratemporal economies of scope, firms can achieve inter-temporal benefits of scope by "redeploying resources and capabilities between related businesses" (Helfat & Eisenhardt, 2004). Resource relatedness is key to redeployability not only because the redeployed resource would have a better fit (and thus create more value) to the destination business, but also because relatedness reduces the costs of redeployment (Sakhartov & Folta, 2014). Value tends to be higher and adjustment costs lower when redeploying resources between similar businesses within a firm, so the greater such similarity, the more attractive resource redeployment is as a second-choice pivot after acquisition failure than divestiture<sup>4</sup>.

# Hypothesis 2: Resource similarity between the bidder's operating segments reduces the likelihood of a targetrelated divestiture after deal termination.

Firms may have some capability to produce desired resources in-house even when choosing to engage in an acquisition for similar resources. But this raises the question of why the firm was attempting to grow through M&A if it already had the resources for internal development. A plausible explanation would be that an acquisition may give a firm faster speed to market than would internal development (Lee & Lieberman, 2010). Alternatively, the firm may anticipate acquiring the technology or tacit knowledge of the target to be less costly than developing commensurate tacit knowledge (Puranam & Srikanth, 2007). The focal firm may favor acquisition more than internal development as a way of limiting rival access to key resources, or to increase the firm concentration in the focal product market (Moatti et al., 2015).

<sup>&</sup>lt;sup>4</sup> We anticipate that proximity between the bidder's core and non-core business could also have the effect of making the status quo more attractive due to intra-temporal synergies, which would reduce the likelihood that the non-core business is a VCR in the first place. For the purposes of this theory, we are assuming the value of the status quo as being below the next best option.

Capron and Mitchell (2009) describe a continuum from a small capability gap (which favors internal development of the desired capability) to a large capability gap (which favors acquisition of the desired capability). Even given that the focal firm attempted an acquisition, the smaller the capability gap, the more likely internal development is seen as the next best option. In terms of the model above, the cost of internal development would be lower given a better fit of the current resources available for such development. The similarity between the core resources of the bidder and the core resources of the target can serve as a proxy for the bidder's capacity to internally develop the new resource/capability as an alternative to a successful acquisition (Capron & Mitchell, 2012). We, therefore, anticipate observing a pivot to divestiture after failed acquisition to be less likely the more similar the bidder and target's core resources, as a pivot to internal development could be more attractive.

# Hypothesis 3: Resource similarity between target and bidder reduces the likelihood of a target-related divestiture after deal termination.

Similar to the other moderators, when conditions are more conducive to a strategic alliance, we should expect fewer pivots to divestitures after a failed M&A transaction because the bidder may pivot to a strategic alliance instead. Villalonga and McGahan (2005) noted that firms can build capabilities in managing alliances. As a firm has more experience finding, forming, and managing alliances, the cost/difficulty of pursuing an alliance to access new resources is reduced. This can reduce the costs of efficiently and effectively managing an alliance (reflected in general alliance experience) and reduce the search costs of partnering due to the availability of potential alliance partners in the target industry. As the cost of strategic alliance is lowered, a firm would be increasingly likely to pivot to this transaction mode rather than divestiture after a failed acquisition.

Hypothesis 4: Alliance experience of the bidder reduces the likelihood of a target-related divestiture after deal termination.

#### **METHODS**

#### Data

Our sample is drawn from U.S. public firms undertaking an M&A transaction between 1984 and 2019, as well as other U.S. public firms operating in the same period (for the formation of the control group of firms that did not undertake a transaction, but were similarly "at risk" to do so). Firm accounting and stock information is drawn from the CRSP/Compustat merged dataset available from the Wharton Research Data Service (WRDS). Information on M&A and divestiture transactions is drawn from the Refinitiv Workspace (formerly Thomson One) Mergers and Acquisitions dataset. Strategic alliance information is drawn from the SDC Joint Ventures and Alliances dataset. The source for the proposed exchange ratio of stock and/or cash for each transaction was provided by Factiva and the primary sources constituted press releases, transcripts, and news articles from periodicals such as the Wall Street Journal, the New York Times, the Washington Post, the Los Angeles Times, and other regional newspapers.

The sample is an imbalanced panel with firms entering in the first year listed in the Compustat dataset (generally when the firm is first publicly listed) and exiting either when the firm is de-listed (e.g., when a firm is liquidated, acquired, or taken private) or in 2019. All continuous variables are winsorized at the 1<sup>st</sup> and 99<sup>th</sup> percentile. The observation level is at the firm-year.

During the time period of 1984 and 2019, there were 2,714 acquisition bids announced and resolved where both the bidder and target were publicly traded companies. Of these bids, 442 were terminated and the remaining 2,272 resulted in completed acquisitions. After restricting the sample to firms involved in at least one of these transactions and omitting observations with missing data, 9,022 firm-year observations remain for the first difference models used below; 18,461 firm-year observations remain for the difference-in-difference models comparing firms with successful M&A; and 15,707 firm-year observations remain in the models comparing a matched pseudo sample of

firms not undertaking M&A. Descriptive statistics for all variables for these models can be found as supplemental tables in the appendix.

#### Identification Strategy

The primary threats to causal identification in our model relate to the endogenous choices of both engaging in a certain deal and then subsequently engaging in a divestiture. There should be many unobserved factors in the endogenous process of making these decisions; in this context, such endogeneity creates the potential for selection bias and omitted variable bias.

We begin with an assumption that a vast majority of firms do not announce an acquisition deal with the intention of the deal being terminated. Once the bidder and target have reached an agreement on the deal terms and publicly announced the transaction, in nearly all cases the bidder anticipates that the deal is more likely to be completed than to be terminated. Not only are deals that reach completion five times more prevalent than terminated deals in our sample period, but there are also significant costs, reputational risks, and legal restrictions that make entering an agreement in bad faith unappealing. These include sunk costs of time and money from, for example, the search for a target, the due diligence process, and negotiations. The deal may have explicit and substantial breakup fees. In addition, the shareholders of the target firm may be able to leverage the legal system to force deal completion.

However, even if a bidder expects when entering a deal agreement that it will probably be complete, assuming that a deal failure is an exogenous event is too strong. There are systematic differences between firms that could affect both likelihoods of a failed transaction as well as divestiture patterns. Selection bias could arise because the type of firm that would put forward bids more likely to be terminated may also be the type of firm more likely to engage in divestitures due to factors unrelated to the focal deal's termination.

To address this threat to inference, we first control for observable factors about the bidder, the target, and their industries such as sales growth rates, profitability, capital investment intensity, leverage, diversification, and others detailed in the following section. These factors could plausibly affect both the willingness to enter a risky deal as well as divestiture patterns. We also include fixed effects at the transaction and year levels to mitigate the impact of idiosyncratic aspects of specific deals or macro-economic effects (including the overall regulatory environment in a given year).

The control variables we selected are common in the literature, but we do not assume that these capture all of the confounding effects that are potentially observable. Nor do we want to use an "everything and the kitchen sink" approach to adding additional control variables, which would increase the risk of including bad controls (which would introduce a different source of bias). Our solution is a novel empirical technique for this context, which is a key empirical contribution of this work. We utilize a coarsened exact matching (CEM) model as other scholars studying M&A transactions have done, but we include deal-arbitrage risk (DAR) as a matching factor.

DAR is based on the relationship between the announced deal price per share of the target's stock and the spot price in the secondary equity market for those same shares. When an acquisition transaction is announced, the bid price exceeds the market price for the target company shares, representing the bid premium offered to current investors. Between a deal announcement and the closing date of the transactions, the target company shares can be traded on the secondary equity market. During this period, other investors who believe the transaction will close may be interested in buying the stock in anticipation of receiving the bid price at the closing date. As the spot price increases from this bid pressure, current shareholders who are pessimistic that the deal may be terminated are more inclined to sell their shares. The result is that during the transaction period between announcement and close, the spot price of the target shares usually gets closer to the bid price, but will not reach all the way to that level because of the risk of termination. The marginal

investors in these periods are often short-term investors with a strategy of deal-risk arbitrage. They will buy or short-sell according to whether they believe the spread between the offer price is too large or small relative to the risk that the deal will be terminated. The DAR is the ratio of the spread at a given point in time over the original spot price of the target stock just before the deal was announced.

Such arbitrage markets usually have enough trading volume to support the assumption that they are relatively efficient. Under this assumption, the magnitude of the DAR is a suitable measure of professional investor sentiment regarding how likely a deal is to close or be terminated. Assuming these arbitrage specialists have adequate capital and are highly motivated to make an accurate prediction, this should be a direct measure of deal risk that incorporates not only publicly available information, but also the private information it is possible and worth such specialists acquiring.

When a CEM model includes DAR as well as major observables, terminated deals are matched with completed deals *that had similar riskiness of termination* ex ante. From the standpoint of stakeholders fairly early in the transaction window, whether deals with similar risk ultimately will be terminated can be thus thought of as a quasi-random process.

We do not argue that the termination of an M&A transaction is exogenous in all cases bidders can in some circumstances choose to terminate a deal directly or take actions that result in termination. The argument above is that bidders overwhelmingly do not *enter* the transaction with the intention of terminating the transaction. It is the changes in circumstances during the transaction period that either cause the deal to fail outright (e.g., regulatory disapproval) or provide the bidder with new information and an opportunity to exit (e.g., a material breach of the agreement by the target). In terms of the formal model above, by matching firms on major observables and DAR, we are trying to isolate exogenous shocks to the anticipated cost of acquisition, or  $C_a$ . We are assuming that a firm would not willingly choose to increase its cost to get the same benefit (owning the target company) after an agreement has been reached, therefore any increase in  $C_a$  should be predicated by an exogenous change in external circumstances or the actions of another entity. An increase in  $C_a$ that triggers the termination of a deal that triggers a pivot to the next best option (divestitures in our study) should then be identified to the extent that our assumptions hold.

The empirical approach described above seeks to compare a firm that experiences deal termination to an otherwise similar firm with a completed but otherwise similar deal. However, an alternative explanation still remains: what if firms that pursue M&A in a given period have a lower propensity to make divestitures compared with firms that are not pursuing M&A at the time? If this is true, then perhaps firms with a terminated deal are simply 'returning to baseline' rates that they would have had if they had not engaged in a transaction at all. We address this alternative explanation by using propensity matching to synthesize a control group of firms that are equally 'at risk' of announcing an M&A deal as the focal firm was, but which did not announce such transactions. This pseudo-sample is used as a proxy for the unobserved counterfactual of if the focal firm with a terminated deal had not entered into the deal in the first place.

#### **Estimation Method**

Our initial models use a Poisson regression by quasi-maximum likelihood (QML) with fixed effects (Hausman, Hall, and Griliches, 1984) for several reasons: First, our dependent variable is a count of new divestitures undertaken by each firm in year t. This is in line with prior studies on divestitures that have adopted count model specifications (e.g., Berry, 2010; Kaul, 2012; Vidal & Mitchell, 2015). Second, QML Poisson standard errors are consistent even if the distribution of our dependent variable is negative binomial or Poisson (Azoulay et al., 2010). Third, Poisson regression model relies on the assumption that the conditional mean and variance are the same. It can happen that in many cases, including our data, the variance is larger than the mean; however, QML Poisson is not constrained by this assumption (Cameron & Trivedi, 2013). Last, QML standard errors are robust to

arbitrary patterns of serial correlation (Wooldridge, 2010), and hence are immune to severe serial correlation problems (in the context of DD estimation) highlighted by Bertrand, Duflo, and Mullainathan (2004). This empirical advantage leads many recent works to use QML Poisson estimator for their quasi-experimental designs (e.g., Azoulay et al. 2010; Agarwal, Rosell, and Simcoe, 2020; Guceri and Liu, 2019). We cluster the standard errors by deal to account for over-dispersion and thereby correct confidence intervals, for all regressions. The results are robust to clustered standard errors at the firm and the industry level.

We first take a first-difference model to capture the main effect and the moderating effects (shown in Equation 7),

$$E(y_{it}) = \exp \left\{ \begin{array}{c} \beta_0 + \beta_1 \cdot Post_{it} + \beta_3 \cdot Moderator_{it} \\ + \beta_3 \cdot Post_{it} \cdot Moderator_{it} + \delta X_{it} + \rho_i + \gamma_t + \varepsilon_{it} \end{array} \right\}$$
(7)

where  $y_{it}$  is the outcome variable of interest, the number of divestitures, for bidder i in year t,  $\beta_0$  is the intercept,  $Post_{it}$  is an indicator variable that takes the value of one for the years following the deal termination year.  $\beta_3$  represents the post-divestiture change in alignment of moderating variables of interest: Relatedness to Acquisition Target, Resource Similarity between Bidder's Businesses, and Alliance Experience of Focal Firm.  $X_{it}$  is a vector of covariate controls for bidder *i* in year *t*. The regression model includes deal fixed effects  $\rho_i$  and year fixed effects  $\gamma_t$ , and  $\varepsilon_{it}$  is the error term.

The second approach uses various forms of difference-in-differences (diff-in-diff) models to compare the treatment group to a control group of firms whose acquisition transactions were successfully completed. Equation 8 presents the base diff-in-diff model,

$$E(y_{it}) = \exp\left\{ \begin{array}{c} \beta_0 + \beta_1 \cdot [Treat_i \cdot Post_{it}] \\ +\beta_2 \cdot Post_{it} + \delta X_{it} + \rho_i + \gamma_t + \varepsilon_{it} \end{array} \right\}$$
(8)

where  $\beta_1$  identifies the main treatment effect,  $Treat_i \cdot Post_{it}$ , and  $\beta_2$  captures the impacts for a bidder that completes its deal. In the supplemental tables of the appendix, we enhance the basic diffin-diff model by including more flexible econometric specifications: a term intended to capture potential pre-trends as well as the potential for such pre-trends to be non-parallel between the treatment and control groups. While the assumption of parallel trends underlying diff-in-diff models is ultimately untestable, with this flexible event study approach, we can at least look at potential effects in the pre-event period and how the effects vary for the post-event period.

In addition, to provide a more complete picture and distinguish the impacts of deal termination from that of the deal announcement itself, we run the following regression (Equation 9),

$$E(y_{it}) = \exp \begin{cases} \beta_0 + \beta_1 \cdot \left[ Treat_i \cdot Before \ Announcement_{[Ta-6:Ta-4]} \right] \\ + \beta_2 \cdot \left[ Treat_i \cdot Negotiation \ Period_{[Ta\ 1:Ta\ 2+1]} \right] \\ + \beta_2 \cdot \left[ Treat_i \cdot Post_{[Tt\ 1:Tt\ 3]} \right] \\ + \beta_2 \cdot \left[ Treat_i \cdot Post_{[Tt\ 2:Tt\ 6]} \right] \\ + \beta_2 \cdot \left[ Treat_i \cdot Post_{[Tt\ 7:Tt\ 9]} \right] \\ + \delta X_{it} + \rho_i + \gamma_t + \varepsilon_{it} \end{cases}$$
(9)

where *Before Announcement* [Ta-3:Ta-1] serves as a baseline for the regression,

*Before Announcement*<sub>[Ta-6:Ta-4]</sub> is an indicator variable that takes the value of one for the period of -6 to -4 years to the deal announcement year and zero otherwise,

*Negotiation Period*<sub>[Ta 1:Ta 2+]</sub> is an indicator variable that takes the value of one for the following years between the announcement year and the deal termination (or deal completion) year and zero otherwise, and  $Post_{[Tt a:Tt b]}$  means *a* to *b* years post to the termination (or the completion) of M&A deals.

#### Variables

The variables used in this study are detailed below and summarized in Table 2.

#### **Outcome Variable**

*Target-Related Business Divestitures.* Our primary outcome variable is the number of divestitures the focal firm undertakes each year in industries / sectors related to the intended target firm. Proximity is measured by the two-digit standard industrial classification (SIC) code. For example, if the four-digit SIC code of the target's business is 2833, then this measure is the number of divestitures the

focal firm makes of businesses with a two-digit SIC code of 28 in a year. Divestitures include selloffs, spinoffs, and equity carve-outs (Villalonga & McGahan, 2005).

#### **Explanatory Variables**

*Failed Acquisition Bid.* The two variables related to deal termination are *Treat* and *Post. Treat* is a binary variable with a value of one if the focal firm's focal deal has or will be terminated (*i.e.*, the firm is part of the treatment group). *Post-Termination* is a binary variable that takes a value of one for all years after the event date and zero otherwise. The event date is the date of termination for the treatment group and the date of deal close for the control group.

#### **Moderator Variables**

*Relatedness to Acquisition Target.* To assess business relatedness, we adapted the method of Finkelstein and Haleblian (2002) using both primary and secondary four-digit SIC codes. We used the following weighting system: if any of the secondary SIC codes for the bidder's business matched any of those of the target firm, we assigned one point if the match was at the two-digit level, two if they matched at the three-digit level, and three if they matched at the four-digit level. The same weighting scheme was applied to primary SIC codes, but with the points assigned doubled (*i.e.*, two, four, and six). The result of the sum of scores obtained by matching the primary and secondary SIC codes was therefore a business relatedness score between zero and nine. Zero identified a dyad of firms that shared neither secondary nor primary SIC codes (even at the two-digit level), and nine refers to a dyad that shared primary SIC codes at the four-digit level and at least one secondary SIC code. To check robustness, we also used a binary measure of relatedness with a value of one if the bidder's three-digit SIC code is the same as the target's.

*Resource Similarity between Bidder's Businesses.* This measure is designed to capture adjustment costs within a firm. It is defined as the mean similarity between all pairs of business segments of the focal bidder, following the approach of Dickler and Folta (2020). We likewise create this measure

using two datasets: the 1997 Bureau of Economic Analysis (BEA) capital flow table and the Bureau of Labor Statistics (BLS) Occupational Profiles dataset (Dickler & Folta, 2020). The BEA data are used to calculate similarities in the use of tangible resources across industries; the BLS data are used to calculate similarities in the types of human capital used across industries. Single segment firms have a value of zero for this variable.

Alliance Experience of Focal Firm. Prior literature has shown that prior alliance experience increases the propensity to engage in subsequent alliances (Villalonga & McGahan, 2005). This measure represents the recent experience the focal firm has had with strategic alliances. It is measured as the natural log of the total number of strategic alliance transactions (+1) within the five years prior to the observation year of the focal deal.

*Alliances Undertaken in Target Industry.* This measure is the extent of alliance experience by other firms in the target industry, which serves as a proxy for the opportunity to form alliances as an alternative after acquisition deal termination. It is measured as the natural log of the total number of strategic alliance transactions of non-focal firms in the target industry (+1) within the three years after the observation year of the focal deal. A similar approach has been used to identify potential targets for M&A (e.g., Chakrabarti & Mitchell, 2013).

#### Controls

This study uses a variety of controls including *Business Size*, *Profitability*, *Capital Expenditures*, *Financial Leverage*, *Diversification*, *Bankruptcy Risk*, *Acquisition Experience of Focal Firm*, *Divestiture Experience of Focal Firm*, and *Industry Growth*. Please see Table 2 for a description of how these controls are calculated.

*Fixed Effects.* We include fixed effects for the acquisition deal and year, and standard errors are clustered at the acquisition deal level.

Deal Arbitrage Risk (DAR). Matching on the riskiness of the acquisition deal is designed to account for the non-randomness of M&A terminations. Prior literature in finance argues that once a

deal is announced, merger arbitrageurs attempt to predict the probability of the deal being approved and how long it will take to finalize the deal, by engaging in costly information acquisition (Larcker & Lys, 1987). The calculation of the DAR is  $\frac{Cash+(ER)*Bidder Stock Price_t - Target Stock Price_t}{Cash+(ER)*Bidder Stock Price_t}$ , where Cash is the amount of cash offered as part of the purchase price, ER is the deal exchange ratio (i.e., the number of shares of the bidder's common stock offered to the target's shareholders for one share of the target's common stock), and t is the time at which the DAR is measured. Note that for all cash deals, the value of ER becomes zero and for all stock deals, the value of Cash becomes zero. For matching models, we only include deals that are either all cash, all stock, or a combination of cash and stock. Deals using other types of consideration are omitted. While different time periods after deal announcement but before deal termination / close could be used as the value for t, our main specifications use one day after deal announcement. Our results are robust to the use of DAR measured at several different times (e.g., one month after announcement, six months after announcement, or the median time between announcement and resolution). Figures 1a and 1b compares the average deal risk spread of completed vs. terminated firms. These figures show that the DAR is quite useful as a proxy for the risk that a deal will be terminated before completion. Additionally, we present the validation of DAR in Tables A10 and A11 of the appendix. Table A10 provides the results of an OLS regression analysis, illustrating the relationship between DAR and the probability of M&A deal termination. Table A11 compares the pre-matched and post-matched samples, specifically in relation to their DAR values.

#### [Insert Table 2 and Figures 1a and 1b about here]

There are three different samples representing the three different control populations (focal firm pre-termination, other firms with successful M&A, and pseudo-sample control firms); for brevity, summary statistics and cross-correlation tables for each sample are included in the appendix.

#### RESULTS

This study analyzes the relationship between M&A deal termination and subsequent divestiture activity. The main results for Hypothesis 1 are found in Tables 3 and 4 as well as Figure 2. Table 3 presents the results of a Poisson estimator within a first difference model comparing divestiture activity within firm before and after M&A deal termination. The coefficient of interest (in bold and highlighted with an outline) can be interpreted as deal termination leading to a 0.654 increase in the log of the expected count of subsequent divestitures in industries related to the target business. The mean of this sample is 0.06 target-related divestitures per year, so the magnitude of this increase in such activity.

It is worth noting that this effect does not extend to a general increase in overall divestiture activity, as there is no substantial effect on divestiture activity in industries unrelated to the target business (Table 3, Column 2). This builds confidence that firms are not responding to deal termination out of a generalized pressure for action, but rather that the divestitures spurred are more likely to be strategically complementary to the resources the firm had attempted to acquire.

Table 4 presents the results of a difference in difference model using coarsened exact matching. The outcome variable is again divestiture count using a Poisson estimator, so the coefficients of interest can be interpreted as a change in the binary variable of *post-termination* leading to a change in the natural log of the number of target-related divestitures per year. Columns 1 and 3 compare firms with a terminated M&A deal to CEM-matched firms (including matching on deal risk) with an M&A deal that successfully closed. Columns 2 and 4 use a pseudo sample as a comparison group comprised of firms matched to be similar on observables and equally likely to have entered an M&A deal as the treated firms, but that did not actually engage in an M&A deal in the given year. The leftmost columns (1 and 2) present the hypothesized relationships of deal

termination leading to target-related divestitures; the rightmost columns (3 and 4) show that this effect is not driven by an overall increase in divestiture activity generally, as target-unrelated divestitures do not seem to be affected. Figure 2 offers a graphical depiction of the results against firms with successful M&A to show the results of divestitures after termination over time.

As with the first difference model, the results of the difference in difference models show positive, economically significant estimates of the effects predicted by Hypothesis 1. Because the mean of *Target-Related Business Divestitures* in the sample for columns 1—3 is 0.08, the coefficient of interest of 0.433 (the predicted increase in the natural log of divestiture count) represents an increase of 0.04, or approximately 50 percent of the sample mean of target-related divestitures. Because the mean of *Target-Related Business Divestitures* in the sample for columns 4—6 is 0.06, the coefficient of interest of 0.382 represents an increase of 0.03, or approximately 50 percent of the sample mean of target-related divestitures. Thus, both the first difference and difference in difference models show strong and consistent effects supportive of Hypothesis 1.

#### [Insert Figure 2, Tables 3, 4, and 5 about here]

Table 5 presents the results pertaining to the potential moderators of the relationship between deal termination and divestiture presented in Hypotheses 2, 3, and 4. These hypotheses predicted that the effect of deal termination leading to greater target-related divestiture activity would be weaker when conditions were conducive to a pivot to a different resource reconfiguration method—resource redeployment for Hypothesis 2, internal development for Hypothesis 3 (measured two different ways), and alliance activity for Hypothesis 4 (measured two different ways). The point estimates of interest are the interaction effects in bold that are outlined. Each of these point estimates is negative, which is directionally as hypothesized. The coefficient magnitude of the estimates is large and standard errors small for *Relatedness to Acquisition Target* and *Resource Similarity Between Bidder's Businesses*, supporting Hypotheses 2 and 3. However, the magnitude of the point

estimates is too small and the standard errors too large to provide sufficient support for Hypothesis 4.

To visually depict the robustness of our main result to a variety of specification choices, we include Figure 3 which is a specification map of the coefficient of interest and accompanying confidence intervals. The specification choices iterated include: *i*) Model Type (First Difference; Difference in Difference), *ii*) Matching Technique (CEM; PSM; Entropy Balancing), *iii*) Matched Control Group (M&A Completed Firms; Pseudo-Sample Firms), *iv*) Definition of "related" industry (SIC2; SIC3; SIC4; or continuous measures using relatedness of tangible assets or human capital), *v*) Time period of the outcome variable (1-3 years; 1+ years; 3+ years). Our findings are also consistent when we include *Alliances Undertaken in Target Industry* (a measure of the relative attractiveness of alliance as an option to pivot) and *Acquisitions Undertaken in Target Industry* (a measure of the relative attractiveness of other potential acquisition targets) as controls variables across all Poisson models.

The results are robust to these specification choices, as well as the choice of control variables included in the models. The results are sensitive to the omission of year and deal fixed effects, becoming indistinguishable from no effect in some models if such fixed effects are not included. Considering the endogenous choices and unobserved heterogeneity between firms, specific deals, and the macroeconomic factors in a given year, we believe models including deal and year fixed effects to be more informative than naïve models. In addition to Poisson estimators, we conducted robustness tests using OLS estimators and Logit estimators (in the case of Logit, using a binary outcome variable of whether or not the focal firm had at least one divestiture in the focal year). The main results are robust to such a choice of estimator, and while some moderator estimates had larger standard errors, the coefficients of interest remained directionally consistent with the results of the Poisson estimations shown above. As our theory is most relevant to diversified firms, we also tested

restricting the sample to solely diversified firms, with consistent results (reported in Table A8 of the appendix).

An alternative explanation for our results is that a bidder who has failed in a previous attempt to acquire a business due to antitrust issues may opt to divest their business to secure regulatory approval for future acquisitions. To rule this out, we perform a manual review of the reasons for all failed bids and limit our estimations to a sample that excludes cases involving government rejection. Our results are robust to the use of this restricted sample. Another factor to consider is the potential sensitivity of our results to the specific reasons for failure. For instance, changes in macroeconomic conditions or in the target's industry could render both the acquisition and the acquirer's businesses in that industry less valuable, thereby increasing the likelihood of both deal termination and divestitures. To account for these possibilities, we tested our hypotheses using separate samples and found our results to be more pronounced in cases where the bidders' attempts to acquire failed due to i) target's refusal, ii) emerging competing offers, or iii) regulatory intervention. These are instances where the bidders intended to acquire but failed unintentionally. The details of these results are reported in Table A9 of the appendix.

[Insert Figure 3 about here]

#### DISCUSSION

In this study, we have empirically tested if firms that experience deal termination of an attempted M&A transaction respond by making divestitures related to the target business. The main empirical contributions of the paper are two-fold. First, we provide empirical support for M&A deal termination to be an antecedent of divestitures. Of particular note is that target-related divestitures not only increase over the firm's own baseline and over that of other comparable firms, but such divestiture activity is higher than that of similar firms whose deals were *completed*. This is noteworthy because it has been well established in the literature that after completing an M&A deal a firm tends

to engage in more divestiture activity (Capron, Mitchell, & Saminathan, 2001; Moschieri & Mair, 2008). The finding is that when a deal fails, not only is target-related divestiture activity increased, but it plausibly is even higher than it would have been had the deal gone through.

In supplemental analysis, we explored how the main finding maps across the different reasons for deal termination (see Table A9 of the appendix). Some reasons for deal failure are within the control of the bidder, which creates greater concern for unobserved endogenous processes driving our relationships of interest, but in fact, we find that deals whose failure was attributed to another entity (either through regulatory rejection, target refusal, or getting outbid by a competing offer) had an even stronger main effect, which alleviates some of this concern. It is noteworthy that regulatory disapproval of an announced deal appeared to have the strongest effect not only for target-related divestitures, but to a lesser extent for target-unrelated divestitures as well. A potential alternative explanation for this greater effect could be an unsuccessful bidder trying to divest resources that previously raised competitive concentration concerns (or to reduce market power more broadly) before trying to make another acquisition in the same space. Whether a bidder is pursuing this strategy or is exiting a VCR business warrants future study.

The second key empirical contribution is the novel method of using the risk of deal failure as a way to match successful and unsuccessful M&A transactions. Using coarsened exact matching as a tool of identification is common in studies of M&A-related phenomena given the inherent unobservable endogenous processes. Including deal risk in this matching improves the fit of successful and unsuccessful M&A transactions as a proxy counterfactual for one another. Arbitraging the deal risk spread on announced deals is a fairly common trading strategy of many investment firms, which lends credence to this spread being a reasonable measure of the market's judgment of the likelihood of deal failure.

The main theoretical contribution of the paper is to explore an important antecedent to divestiture activity previously unexplored: the termination of an attempted M&A transaction. This is interesting because the common view of divestitures (and resource redeployment) is focused on it as a tool to "shed misaligned or obsolete resources and business" (Karim & Capron, 2016). As a tool of retrenchment, divestitures can not only be a tool for leaving a failing business, but can proactively free up resources to focus on future growth in other areas by narrowing the firm's scope (Bennett & Feldman, 2017). A clear example of this would be firms divesting some parts of the target after an acquisition to limit redundancy and the extent of unrelated diversification (Villalonga & McGahan, 2005). Guided by these mechanisms, intuition would suggest that after an M&A deal termination, a firm would either return to the status quo or attempt growth through another mechanism (internal development, partnership, or another acquisition attempt). Because the firm has credibly signaled the intention to grow in the target resource area, it would not seem scope narrowing would be necessary. Additionally, since the target was not actually acquired if the deal is terminated, there would be no redundancies or unrelated pieces of the target to necessitate divestiment.

We propose the conditions under which firms experiencing M&A deal termination might indeed pivot to divestiture. If the focal firm currently holds value-contingent resources—those complementary to the intended target's resources but not sufficiently value creating on their own then a terminated deal does not only perpetuate a strategic gap; the focal firm is also left in a position where they have resources, a cost structure, and perhaps already an organizational structure in place that anticipated the keystone resource being brought in. When this does not materialize, the animus for building or maintaining that resource position may be gone. In such cases, a wellmanaged firm could be expected to pivot to exit that position instead of returning to the status quo.

Our research aims to integrate resource position exit strategies, such as divestitures or resource redeployment, with the Build, Borrow, or Buy framework, thereby responding to the call

for a more holistic resource reconfiguration framework (Vidal, 2021; Villalonga & McGahan, 2005). While scholars have explored resource growth and resource exit and the sequencing of these activities, the frameworks used are often based on a two-stage decision process, with the first-stage being the decision to grow or exit followed by the second-stage choice of transaction mode. By thinking of resource reconfiguration as a menu of options simultaneously considered and prioritized, we hope to better match a framework with how savvy corporate leaders view resource planning. While this distinction may not be meaningful in analysis of one-off transactions, it opens up new potential theoretical insights in resource reconfiguration dynamics over multiple time periods. An example of this is in better predicting a firm's subsequent resource reconfiguration actions when an attempted transaction fails; there is ample opportunity for future research to explore transaction failures of modes other than acquisition. To visualize a more holistic view of resource reconfiguration, we can expand these separate continuums, the BBB framework (Capron & Mitchell, 2012), acquisition/divestiture (Villalonga & McGahan, 2005), and divestiture/redeployment (Feldman & Sakhartov, 2022) into one structure (Vidal, 2021). Figure 4 depicts this combined view.

#### [Insert Figure 4 about here]

The vertical axis in this map represents resources coming into or going out of the focal business (e.g., to another company or redeployed within the focal firm). Strategic partnerships represent the resource-neutral position, with the resources of the partners under their own control or under joint control. Contracting and licensing typically constitute the temporary exchange of some control rights to the counterparty and could be either direction depending on whether the focal firm is granting or receiving such rights. Internal development and M&A constitute the most resource growth, as they typically result in full control of new resources and capabilities in the focal business. In the lower region of the map are the options for exiting the focal business in whole or in part. Divestitures would include both selloffs and spinoffs and typically represents the focal firm

fully giving up resource control rights. For resource redeployment, while the focal firm maintains ownership, control of the resources will no longer be under the focal business within the firm.

The horizontal axis denotes the relationship of the transaction to firm boundaries. Both internal development and resource redeployment constitute working fully within the firm to increase or reduce the resources in the focal business. Strategic partnerships and contracting constitute working across firm boundaries between the focal firm and the counterparty, as each firm tends to maintain long-run control over the resources they provide even if some control rights are temporarily ceded to the other. M&A and divestitures are fully to the right because they result in the altering of the boundaries of the firm. The horizontal axis also can be thought of as representing the relative cost or time required to reverse the resource commitment of a particular mode. The options to the left are generally easier to reverse as they are about shifting or leveraging resources already within the focal firm. Contracts and partnerships are less reversible as there are more constraints on the focal firm's ability to make a unilateral decision to reverse or change course. M&A and divestitures on the right tend to be the most costly or most difficult to reverse as another transaction would be required to restore the original boundaries of the firm.

As a final note, each of the authors has gained substantial value out of the Build, Borrow, or Buy model and it is a cornerstone in how we teach corporate strategy to our students. Organizing the tools available for resource reconfiguration into clear, sensible frameworks is a tremendous help in clarifying theoretical predictions as well as training future and current leaders about the strategic options of a modern firm. As scholars respond to the call for more research on the strategic use of resource redeployment and divestitures (Feldman & McGrath, 2016), our goal is to promote even more explicit connections between all the forms of resource reconfiguration as an integrated phenomenon.

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# Figure 1a: Relative Risk Spread of Terminated vs. Completed Deals Up to Completion/Termination Date









Figure 2: Diff in Diff Results with CEM vs. Successful M&A Firms (left) and Pseudo Sample (right)







# Figure 4: Resource Reconfiguration Theory Map

# Table 1: Resource Reconfiguration Payoff Matrix

Transaction Mode	Payoff	Major Drivers of Value
Status Quo	R(c)	Current resource/environment fit
		Internal knowledge fit
Build	$R(c) + R(k) + \lambda (R(c)R(k)) - C(i)$	Internal R&D capacity
		Resource relatedness
		Resource tradability
Borrow	$R(c) + R(k) + \lambda (R(c)R(k)) - C(p)$	Incentive alignment
	, <i>,</i> ,	Flexibility under uncertainty
		Integration capability
Buy	$P(c) + P(k) + \lambda (P(c)P(k)) - C(a)$	Anti-trust regulatory environment
Buy	$K(c) + K(k) + \lambda(K(c)K(k)) = C(u)$	Premium required
		Incentive alignment Integration capability
Redenlow	V(r) = D(r)	Intertemporal economies of scope
Redepioy	V(I) = R(U)	Redeployment cost
		Synergies for buying firm (selloff)
Divest	V(d) - R(c)	Pure play multiples (spinoff)
		Ability to segregate financials (spinoff)

Outcome Variable	
Target-Related Business Divestitures	Count of number of divestitures focal firm undertakes during the year in industries/sectors related to the target firm (SIC2)
Explanatory Variables	
Treatment (or Treat)	1 if focal firm's focal deal has or will be terminated; zero otherwise
Post-Termination (or Post)	1 if focal year is after the year of deal termination; zero otherwise
Moderator Variables	
Relatedness to Acquisition Target	Weighted distance of bidder's primary and secondary SIC codes to target firm (Finkelstein & Haleblian, 2002)
Resource Similarity between Bidder's	Weighted distance of tangible resources used across all pairs of industries
Businesses (Tangible Asset-Based)	of the focal firm business segments (Dickler & Folta, 2020)
Resource Similarity between Bidder's	Weighted distance of human capital used across all pairs of industries of
Businesses (Human Capital-Based)	the focal firm business segments (Dickler & Folta, 2020)
Alliance Experience of Focal Firm	Natural log of total number of strategic alliance transactions (+1) over the five years prior to the focal year. (Also control in Poisson models)
Alliances Undertaken in Target Industry	Natural log of total number of strategic alliance transactions (+1) by firms other than the focal firm in the target industry within three years after focal year (similar to Chakrabarti & Mitchell, 2013)
Control Variables	
Business Size	Natural log of total assets
Profitability	Earnings before interest and taxes (EBIT) over total assets
Capital Expenditures	Cap Ex over total sales
Financial Leverage	Debt to equity ratio
Diversification	Entropy index of sales by operating segment
Acquisition Experience of Focal Firm	Natural log of total number of acquisition transactions (+1) over the five years prior to the focal year
Divestitures Experience of Focal Firm	Natural log of total number of divestitures transactions (+1) over the five years prior to the focal year
Bankruptcy Risk	1 if Altman's Z is below 1.8; zero otherwise
Industry Growth (Bidder)	Average sales growth rate in the bidder's industry over the three years prior to the focal year
Industry Growth (Target)	Average sales growth rate in the target's industry over the three years prior to the focal year
Additional Matching Variable	
Deal Arbitrage Risk (DAR)	Relative gap between offer price for target and spot price of target's common stock. Main specification is one day after deal announcement, but DAR measured at different times (e.g., one month after announcement) tested for robustness.

# Table 2: Summary of Variables

# Table 3: First Difference Results

	Dependent Variables (Count)									
	Target-Related	Target-Unrelated								
	<b>Business Divestitures</b>	<b>Business Divestitures</b>								
	(1)	(2)								
Post-Termination	0.654	0.057								
	(0.189)	(0.184)								
Controls, Deal FE, and Year FE	Yes	Yes								
Pseudo R2	0.464	0.596								
Log Likelihood	-1567	-2239								
Wald chi2	63.14	47.96								
Observations	9,022	9,022								

Note. Robust standard errors in parentheses. Standard errors clustered by acquisition deal.

	Dependent Variables (Count)												
	Target-Related Bus	siness Divestitures	Target-Unrelated B	usiness Divestitures									
	<b>CEM</b> Firms with	CEM	CEM Firms with	CEM									
	Successful M&A	Pseudo Sample	Successful M&A	Pseudo Sample									
	(1)	(2)	(3)	(4)									
Post-Termination	0.158	0.156	-0.092	0.068									
	(0.119)	(0.192)	(0.139)	(0.230)									
$Treat \times Post$	0.433	0.382	0.177	-0.056									
	(0.191)	(0.195)	(0.212)	(0.195)									
Controls	Yes	Yes	Yes	Yes									
Deal FE and Year FE	Yes	Yes	Yes	Yes									
Pseudo R2	0.446	0.433	0.576	0.459									
Log Likelihood	-3772	-2253	-5171	-3194									
Wald chi2	89.95	188.5	121.4	149.6									
Observations	18,461	15,707	18,461	15,707									

# Table 4: Diff in Diff Results with CEM (including deal risk for columns 1 and 3)

Note. Robust standard errors in parentheses. Standard errors clustered by acquisition deal.

# Table 5: Moderation Results (First Difference)

		Depende	ent Variable	s (Count)	
	]	Farget-Relat	ed Business	Divestiture	s
	(1)	(2)	(3)	(4)	(5)
Post Termination	1 215	0.972	0.965	0.713	0.821
1 Ost-1 emination	(0.368)	(0.263)	(0.242)	(0.205)	(0.292)
Post X Relatedness to Acquisition Target	-0 100	(0.203)	(0.242)	(0.203)	(0.272)
1 ost ~ Relatedness to Requisition Target	(0.050)				
Post × Resource Similarity between Bidder's Businesses	(01020)	-2.827	]		
(Tangible asset-based Measure)		(1.453)			
Post × Resource Similarity between Bidder's Businesses			-4.556	]	
(Human capital-based Measure)			(1.662)	-	
Post $\times$ Alliance Experience				-0.041	
				(0.113)	2
Post × Alliances Undertaken in Target Industry					-0.064
					(0.073)
Relatedness to Acquisition Target	-				
Resource Similarity between Bidder's Businesses	-	3.331			
(Tangible asset-based Measure)		(1.123)			
Resource Similarity between Bidder's Businesses			4.447		
(Human capital-based Measure)			(1.162)		
Alliance Experience of Focal Firm	0.206	0.193	0.210	0.206	0.181
	(0.098)	(0.096)	(0.097)	(0.107)	(0.095)
Alliances Undertaken in Target Industry				. ,	0.092
					(0.093)
Controls Deal EE and Year EE	Vec	Vec	Ves	Ves	Vec
Deeudo R2	0.465	0.466	0.466	0.464	0.464
Log Likelihood	-1564	-1562	-1560	-1567	-1566
Wald chi2	67.10	71.56	84 84	66 25	64.83
Observations	9,022	9,022	9,022	9,022	9,022

Note. Robust standard errors in parentheses. Standard errors clustered by acquisition deal.

# Appendix: Supplementary Tables and Figures

Ta	able	<b>A1:</b> 1	Descriptive	<b>Statistics</b>	for First	t Difference	Models
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Variables	Mean	S.D	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
(1) Target-Related Business Divestitures	0.09	0.40	1.00																	
(2) Target-Unrelated Business Divestitures	0.18	1.05	0.18	1.00																
(3) Post-Termination	0.47	0.50	0.08	0.08	1.00															
(4) Business Size	6.59	2.37	0.21	0.23	0.25	1.00														
(5) Profitability	-0.17	3.56	0.02	0.01	0.02	0.11	1.00													
(6) Capital Expenditures	0.09	0.21	0.00	-0.02	-0.05	-0.04	-0.30	1.00												
(7) Financial Leverage	1.35	64.64	0.00	0.00	0.01	0.00	0.00	0.00	1.00											
(8) Diversification	0.32	0.46	0.07	0.21	0.04	0.36	0.05	-0.08	0.00	1.00										
(9) Acquisition Experience of Focal Firm	0.66	0.74	0.19	0.19	0.22	0.46	0.06	-0.07	-0.01	0.22	1.00									
(10) Alliance Experience of Focal Firm	0.64	0.94	0.19	0.25	0.10	0.44	0.02	-0.03	-0.01	0.17	0.36	1.00								
(11) Divestiture Experience of Focal Firm	0.37	0.70	0.29	0.40	0.29	0.50	0.04	-0.04	0.00	0.27	0.42	0.34	1.00							
(12) Bankruptcy Risk	0.33	0.47	0.07	-0.02	0.12	0.18	-0.01	0.17	-0.01	-0.03	0.06	0.02	0.10	1.00						
(13) Industry Growth (Bidder)	8.29	16.94	-0.02	-0.04	-0.13	-0.13	-0.01	0.04	-0.01	-0.11	-0.07	0.01	-0.12	-0.05	1.00					
(14) Industry Growth (Target)	8.06	15.80	-0.02	-0.03	-0.12	-0.11	-0.01	0.03	-0.01	-0.09	-0.04	0.03	-0.11	-0.05	0.47	1.00				
(15) Relatedness to Acquisition Target	4.39	3.11	0.09	-0.05	-0.07	0.13	-0.05	0.11	0.01	-0.15	0.02	0.07	0.01	0.10	0.01	0.01	1.00			
(16) Resource Similarity (Tangible Asset-Based)	0.08	0.09	0.06	0.07	0.13	0.25	0.06	-0.11	-0.01	0.48	0.20	0.06	0.22	-0.01	-0.11	-0.10	-0.07	1.00		
(17) Resource Similarity (Human Capital-Based)	0.05	0.06	0.09	0.05	0.15	0.24	0.05	-0.09	-0.01	0.24	0.18	0.07	0.23	0.03	-0.10	-0.09	0.01	0.85	1.00	
(18) Alliances Undertaken in Target Industry	2.30	2.10	0.03	-0.04	-0.05	-0.05	-0.03	0.11	0.00	-0.26	0.06	0.27	-0.07	0.01	0.16	0.13	0.21	-0.16	-0.08	1.00

Note. N=9,022. This table lists descriptive statistics for the sample of US publicly-listed firms that terminate M&A between 1984 and 2019. All continuous variables are winsorized at the 1st and 99th percentiles.

#### Table A2: Descriptive Statistics for Diff-in-Diff Models CEM vs. Successful M&A Firms

Variables	Mean	S.D	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Target-Related Business Divestitures	0.10	0.45	1.00																		
(2) Target-Unrelated Business Divestitures	0.20	1.07	0.17	1.00																	
(3) Treatment	0.49	0.50	-0.04	-0.02	1.00																
(4) Post-Termination	0.47	0.50	0.09	0.10	0.00	1.00															
(5) Business Size	6.94	2.40	0.22	0.24	-0.14	0.26	1.00														
(6) Profitability	-0.12	2.95	0.02	0.02	-0.01	0.00	0.12	1.00													
(7) Capital Expenditures	0.10	0.40	0.00	-0.01	-0.03	-0.04	-0.05	-0.20	1.00												
(8) Financial Leverage	0.81	52.38	-0.01	0.00	0.01	0.00	0.00	0.00	0.00	1.00											
(9) Diversification	0.32	0.45	0.08	0.21	0.00	0.07	0.35	0.05	-0.07	0.00	1.00										
(10) Acquisition Experience of Focal Firm	0.77	0.78	0.19	0.19	-0.13	0.30	0.49	0.06	-0.05	-0.01	0.22	1.00									
(11) Alliance Experience of Focal Firm	0.81	1.10	0.20	0.25	-0.16	0.09	0.49	0.03	-0.04	-0.01	0.13	0.41	1.00								
(12) Divestiture Experience of Focal Firm	0.42	0.74	0.30	0.40	-0.07	0.32	0.52	0.04	-0.02	0.00	0.27	0.43	0.36	1.00							
(13) Bankruptcy Risk	0.34	0.47	0.07	-0.01	-0.02	0.16	0.13	-0.02	0.11	-0.01	-0.03	0.05	-0.01	0.12	1.00						
(14) Industry Growth (Bidder)	8.45	16.77	-0.02	-0.03	-0.01	-0.14	-0.11	-0.02	0.03	0.00	-0.09	-0.07	0.02	-0.12	-0.04	1.00					
(15) Industry Growth (Target)	8.56	17.13	-0.02	-0.02	-0.03	-0.13	-0.07	-0.01	0.02	0.00	-0.09	-0.05	0.05	-0.10	-0.04	0.40	1.00				
(16) Relatedness to Acquisition Target	4.43	3.05	0.07	-0.09	-0.01	-0.09	0.02	-0.04	0.08	0.00	-0.17	0.00	0.02	-0.03	0.09	0.02	0.03	1.00			
(17) Resource Similarity (Tangible Asset-Based)	0.08	0.09	0.07	0.08	-0.01	0.16	0.28	0.06	-0.09	-0.01	0.49	0.21	0.07	0.25	-0.02	-0.10	-0.10	-0.08	1.00		
(18) Resource Similarity (Human Capital-Based)	0.05	0.06	0.09	0.06	-0.01	0.17	0.26	0.05	-0.07	-0.01	0.26	0.20	0.09	0.25	0.03	-0.09	-0.08	0.00	0.85	1.00	
(19) Alliances Undertaken in Target Industry	2.43	2.15	0.02	-0.03	-0.06	-0.05	-0.06	-0.03	0.08	0.00	-0.23	0.04	0.21	-0.07	0.05	0.17	0.12	0.20	-0.14	-0.07	1.00

Note. N=18,461. This table lists descriptive statistics for the sample of US publicly-listed firms that complete or terminate M&A between 1984 and 2019. All continuous variables are winsorized at the 1st and 99th percentiles.

Table A3: Descriptive Statistics for Diff-in-Diff Models CEM vs. Pseudo Sample Firms

Variables	Mean	S.D.	(1)	(2)	(3)	(4)	(5)	6	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Target-Related Business Divestitures	0.06	0.34	1.00	(-)	(0)	()	(0)	(0)	(7)	(0)	(2)	(10)	(11)	()	(10)	(1)	(10)	(10)	(-7)	(10)	()
(2) Target-Unrelated Business Divestitures	0.10	0.50	0.22	1.00																	
(3) Treatment	0.56	0.50	0.06	0.07	1.00																
(4) Post-Termination	0.46	0.50	0.08	0.10	0.02	1.00															
(5) Business Size	5.73	2.64	0.19	0.23	0.32	0.22	1.00														
(6) Profitability	-4.31	128.36	0.01	0.01	0.03	0.01	0.04	1.00													
(7) Capital Expenditures	0.22	2.99	-0.01	-0.01	-0.04	-0.02	-0.06	-0.41	1.00												
(8) Financial Leverage	0.44	79.15	0.00	0.00	0.02	0.00	0.00	0.00	0.00	1.00											
(9) Diversification	0.24	0.41	0.08	0.19	0.20	0.05	0.38	0.02	-0.03	0.01	1.00										
(10) Acquisition Experience of Focal Firm	0.53	0.69	0.18	0.21	0.19	0.22	0.47	0.02	-0.03	-0.02	0.21	1.00									
(11) Alliance Experience of Focal Firm	0.56	0.87	0.18	0.20	0.04	0.10	0.40	0.01	-0.01	0.00	0.12	0.35	1.00								
(12) Divestiture Experience of Focal Firm	0.28	0.59	0.28	0.37	0.14	0.26	0.46	0.01	-0.02	-0.01	0.27	0.41	0.30	1.00							
(13) Bankruptcy Risk	0.34	0.47	0.07	0.00	-0.03	0.15	0.08	0.00	0.01	-0.01	-0.03	0.06	0.01	0.11	1.00						
(14) Industry Growth (Bidder)	9.01	18.67	-0.02	-0.03	-0.05	-0.15	-0.12	-0.01	0.00	-0.01	-0.09	-0.08	0.00	-0.10	-0.07	1.00					
(15) Industry Growth (Target)	16.27	317.77	0.00	-0.01	-0.01	0.01	-0.01	0.00	0.00	0.00	-0.02	-0.02	0.02	-0.02	-0.01	0.03	1.00				
(16) Relatedness to Acquisition Target	4.52	3.10	0.06	-0.06	-0.07	-0.06	0.04	-0.01	0.01	0.01	-0.11	0.01	0.05	0.01	0.06	0.03	-0.03	1.00			
(17) Resource Similarity (Tangible Asset-Based)	0.07	0.09	0.06	0.11	0.16	0.12	0.31	0.03	-0.04	0.00	0.52	0.22	0.08	0.22	-0.02	-0.09	-0.02	-0.04	1.00		
(18) Resource Similarity (Human Capital-Based)	0.04	0.06	0.06	0.10	0.09	0.14	0.27	0.02	-0.03	0.00	0.29	0.20	0.08	0.21	0.01	-0.07	-0.02	0.02	0.87	1.00	
(19) Alliances Undertaken in Target Industry	3.12	1.92	0.00	-0.06	-0.21	-0.08	-0.14	-0.01	0.03	0.00	-0.19	-0.04	0.20	-0.12	0.01	0.11	0.01	0.18	-0.13	-0.07	1.00

Note. N=15,707. This table lists descriptive statistics for the sample of US publicly-listed firms that complete or terminate M&A between 1984 and 2019. All continuous variables are winsorized at the 1st and 99th percentiles.

#### Table A4: Descriptive Statistics for Diff-in-Diff Models PSM vs. Pseudo Sample Firms

Variables	Mean	S.D	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Target-Related Business Divestitures	0.06	0.33	1.00																		
(2) Target-Unrelated Business Divestitures	0.12	0.82	0.16	1.00																	
(3) Treatment	0.20	0.40	0.04	0.03	1.00																
(4) Post-Termination	0.46	0.50	0.05	0.08	0.00	1.00															
(5) Business Size	6.41	2.49	0.18	0.19	0.04	0.23	1.00														
(6) Profitability	-1.48	48.76	0.01	0.00	0.01	0.00	0.05	1.00													
(7) Capital Expenditures	0.31	17.85	0.00	0.00	-0.01	-0.01	-0.01	-0.42	1.00												
(8) Financial Leverage	2.41	364.33	0.00	0.00	0.00	0.01	0.00	0.00	0.00	1.00											
(9) Diversification	0.25	0.42	0.07	0.19	0.07	0.04	0.34	0.02	-0.01	0.01	1.00										
(10) Acquisition Experience of Focal Firm	0.46	0.63	0.17	0.18	0.16	0.17	0.37	0.02	-0.01	-0.01	0.16	1.00									
(11) Alliance Experience of Focal Firm	0.59	0.93	0.18	0.22	0.02	0.08	0.41	0.01	-0.01	0.00	0.16	0.36	1.00								
(12) Divestiture Experience of Focal Firm	0.28	0.59	0.28	0.36	0.08	0.25	0.42	0.01	-0.01	0.00	0.24	0.40	0.36	1.00							
(13) Bankruptcy Risk	0.33	0.47	0.05	-0.01	-0.01	0.11	0.16	-0.01	0.01	-0.01	0.02	0.05	0.00	0.10	1.00						
(14) Industry Growth (Bidder)	9.17	39.82	-0.01	-0.01	-0.01	-0.07	-0.05	0.00	0.00	0.00	-0.02	-0.03	0.01	-0.04	-0.02	1.00					
(15) Industry Growth (Target)	12.69	233.99	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	-0.01	0.01	-0.01	-0.01	0.01	1.00				
(16) Relatedness to Acquisition Target	4.37	3.10	0.08	-0.05	0.00	-0.06	0.08	-0.01	0.00	0.00	-0.08	0.01	0.03	0.00	0.09	0.00	-0.02	1.00			
(17) Resource Similarity (Tangible Asset-Based)	0.07	0.09	0.06	0.06	0.07	0.13	0.25	0.03	-0.01	0.00	0.48	0.19	0.09	0.21	0.02	-0.04	-0.01	-0.05	1.00		
(18) Resource Similarity (Human Capital-Based)	0.04	0.06	0.08	0.05	0.05	0.13	0.22	0.02	-0.01	0.00	0.24	0.19	0.10	0.21	0.04	-0.04	-0.01	-0.01	0.86	1.00	
(19) Alliances Undertaken in Target Industry	2.91	1.87	0.02	-0.02	-0.04	-0.07	-0.04	0.00	0.00	0.00	-0.10	0.04	0.22	-0.05	0.02	0.04	0.01	0.10	-0.09	-0.05	1.00

Note. N=45,058. This table lists descriptive statistics for the sample of US publicly-listed firms that complete or terminate M&A between 1984 and 2019. All continuous variables are winsorized at the 1st and 99th percentiles.

Table A5: Descriptive Statistics for Diff-in-Diff Models Entropy	Balancing vs.	Pseudo	Sample Firms
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Variables	Mean	S.D	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) Target-Related Business Divestitures	0.05	0.34	1.00			. ,	. ,													. ,	
(2) Target-Unrelated Business Divestitures	0.12	0.89	0.17	1.00																	
(3) Treatment	0.20	0.40	0.05	0.03	1.00																
(4) Post-Termination	0.49	0.50	0.04	0.05	-0.01	1.00															
(5) Business Size	6.12	2.57	0.19	0.19	0.10	0.22	1.00														
(6) Profitability	-2.96	107.51	0.00	0.00	0.01	0.00	0.03	1.00													
(7) Capital Expenditures	0.26	7.73	0.00	0.00	-0.01	-0.01	-0.02	-0.45	1.00												
(8) Financial Leverage	0.73	47.98	0.00	0.00	0.01	0.00	0.01	0.00	0.00	1.00											
(9) Diversification	0.23	0.39	0.08	0.21	0.12	0.04	0.32	0.02	-0.01	0.00	1.00										
(10) Acquisition Experience of Focal Firm	0.44	0.63	0.20	0.19	0.18	0.16	0.43	0.02	-0.01	-0.01	0.21	1.00									
(11) Alliance Experience of Focal Firm	0.56	0.92	0.20	0.23	0.05	0.06	0.45	0.00	-0.01	0.00	0.15	0.40	1.00								
(12) Divestiture Experience of Focal Firm	0.26	0.58	0.30	0.38	0.10	0.22	0.43	0.01	-0.01	0.00	0.26	0.43	0.37	1.00							
(13) Bankruptcy Risk	0.33	0.47	0.06	-0.01	0.01	0.13	0.15	-0.01	0.01	-0.01	0.02	0.06	0.01	0.11	1.00						
(14) Industry Growth (Bidder)	8.94	26.67	-0.01	-0.01	-0.01	-0.08	-0.06	0.00	0.00	0.00	-0.04	-0.03	0.00	-0.06	-0.03	1.00					
(15) Industry Growth (Target)	15.44	302.81	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	0.00	0.00	-0.02	0.00	-0.01	-0.01	0.01	1.00				
(16) Relatedness to Acquisition Target	4.19	3.14	0.07	-0.03	0.03	-0.06	0.12	-0.01	0.01	0.00	-0.07	0.01	0.05	0.01	0.09	-0.02	-0.02	1.00			
(17) Resource Similarity (Tangible Asset-Based)	0.16	0.22	0.11	0.14	0.11	0.15	0.36	0.01	-0.01	0.00	0.56	0.30	0.20	0.32	0.00	-0.05	0.00	-0.03	1.00		
(18) Resource Similarity (Human Capital-Based)	0.12	0.18	0.11	0.09	0.08	0.15	0.33	0.00	-0.01	0.00	0.37	0.27	0.18	0.29	0.04	-0.06	0.00	0.02	0.88	1.00	
(19) Alliances Undertaken in Target Industry	2.85	1.94	0.03	-0.02	-0.04	-0.10	-0.04	-0.01	0.00	0.00	-0.10	0.04	0.22	-0.04	0.02	0.07	0.01	0.06	-0.07	-0.04	1.00

Note. N=45,944. This table lists descriptive statistics for the sample of US publicly-listed firms that complete or terminate M&A between 1984 and 2019. All continuous variables are winsorized at the 1st and 99th percentiles.

	Dependent Variables (Count)					
	Target-Related Business Divestitures		Target-Unrelated	Business Divestitures		
	PSM	Entropy Balancing	PSM	Entropy Balancing		
	(1)	(2)	(3)	(4)		
Post-Termination	0.158 (0.119)	0.156 (0.192)	-0.092 (0.139)	0.068 (0.230)		
$Treat \times Post$	0.433	0.382	0.177	-0.056		
	(0.191)	(0.195)	(0.212)	(0.195)		
Controls, Deal FE, and Year FE	Yes	Yes	Yes	Yes		
Pseudo R2	0.446	0.433	0.576	0.459		
Log Likelihood	-3772	-2253	-5171	-3194		
Wald chi2	89.95	188.5	121.4	149.6		
Observations	18,461	15,707	18,461	15,707		

# Table A6: Diff in Diff Results with PSM and Entropy Balancing vs. Pseudo Sample

Note. Robust standard errors in parentheses. Standard errors clustered by acquisition deal.

		Dep	pendent Va	riables (Co	unt)		
	Target-Related Business Divestitures						
Sampla	Coarsened Exact Matching to Coarsened Exact M					atching to	
Sample:	Firms with Successful M&A Pseudo S			seudo Samp	ole		
	(1)	(2)	(3)	(4)	(5)	(6)	
Post-Termination	0.158			0.156			
	(0.119)			(0.192)			
$Treat \times Post$	0.433	]		0.382	]		
Treat $\times$ Pre (-4 to -2 years)	(0.191)	-0.097		(0.195)	0.033		
		(0.136)			(0.160)		
Treat $\times$ Post (1 to 2 years)		0.480			0.506		
		(0.210)			(0.195)	-	
Treat $\times$ Post (3 to 4+ years)		0.556			0.464		
Treat × Before Announcement		(0.201)	-0.165		(0.1/5)	-0.090	
			(0.188)			(0.202)	
Treat $ imes$ Negotiation Period			0.206			0.140	
			(0.458)	_		(0.536)	
Treat $\times$ Post (1 to 3 years)			0.517			0.493	
			(0.170)	1		(0.158)	
Treat $\times$ Post (4 to 6 years)			0.523			0.467	
			(0.147)	1		(0.147)	
Treat $\times$ Post (7 to 9 years)			0.369			0.361	
			(0.167)			(0.150)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	
Deal FE	Yes	Yes	Yes	Yes	Yes	Yes	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	
Pseudo R2	0.446	0.446	0.447	0.433	0.433	0.434	
Log Likelihood	-3772	-3773	-3767	-2253	-2253	-2249	
Wald chi2	89.95	91.07	95.77	188.5	177.2	190.1	
Observations	18,461	18,461	18,461	15,707	15,707	15,707	

Note. In Models 2 and 5, the baseline coefficient corresponds to *Treat*  $\times$  *Pre (-1 to 0 years)*. In contrast, for Models 3 and 6, the baseline coefficient is *Treat*  $\times$  *Before Announcement (-3 to -1 years)*. Robust standard errors in parentheses. Standard errors clustered by acquisition deal

	Dependent Variables (Count) Target-Related Business Divestitures						
	Non-Divers	ified Firm	Diversified Firm (Prior to Deal Announcement)				
	(Prior to Deal A	nnouncement)					
	First- Difference	CEM	First- Difference	CEM			
	(1)		(2)	(2)			
Post-Termination	0.369	0.095	0.829	0.195			
	(0.285)	(0.239)	(0.239)	(0.138)			
$Treat \times Post$		0.279		0.573			
		(0.349)	-	(0.246)			
Controls	Yes	Yes	Yes	Yes			
Deal FE	Yes	Yes	Yes	Yes			
Year FE	Yes	Yes	Yes	Yes			
Pseudo R2	0.521	0.463	0.435	0.441			
Log Likelihood	-613.4	-1455	-922.9	-2265			
Wald chi2	65.64	45.81	43.34	125.7			
Observations	4,425	8,999	4,597	9,462			

# Table A8: Analyses with Diversified vs. Single Business Firms

Note. Robust standard errors in parentheses; Standard errors clustered by acquisition deal

Failure Reason:	Target Refusal		Competing Offers		Regulatory Intervention		Others	
	Target-	Target-	Target-	Target-	Target-	Target-	Target-	Target-
	Related	Unrelated	Related	Unrelated	Related	Unrelated	Related	Unrelated
DV:	Business	Business	Business	Business	Business	Business	Business	Business
	Divestitures	Divestitures	Divestitures	Divestitures	Divestitures	Divestitures	Divestitures	Divestitures
	(Count)	(Count)	(Count)	(Count)	(Count)	(Count)	(Count)	(Count)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
		-						
Post-Termination	0.829	-0.460	0.558	0.036	1.834	0.499	0.424	-0.334
	(0.310)	(0.392)	(0.260)	(0.204)	(0.412)	(0.214)	(0.418)	(0.299)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Deal FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R2	0.484	0.536	0.468	0.479	0.478	0.762	0.484	0.572
Log Likelihood	-447.9	-509.7	-372.9	-649	-276.9	-384.4	-397.3	-558.1
Wald chi2	61.31	55.53	102.9	59.56	139.9	64.35	54.37	49.88
Observations	2,237	2,237	2,447	2,447	1,041	1,041	3,297	3,297

Table A9: Failure Reason Analyses (First Difference Estimator)

Note. Robust standard errors in parentheses; Standard errors clustered by acquisition deal

DV:	M&A Deal Termination					
	(1)	(2)	(3)	(4)		
DAR (at $t+1$ )	0.304	0.256	0.209	0.156		
	(0.081)	(0.079)	(0.081)	(0.077)		
	[0.000]	[0.001]	[0.010]	[0.045]		
Controls	No	No	Yes	Yes		
Year FE	Yes	Yes	Yes	Yes		
Bidder Industry FE	Yes	No	Yes	No		
Target Industry FE	No	Yes	No	Yes		
R-squared	0.071	0.079	0.101	0.110		
Observations	2.714	2,714	2,714	2,714		

Table A10: OLS Regression Results on the Relationship between DAR and the likelihood of M&A Deal Termination

Note. DAR is measured on the date following the deal announcement. Control variables are measured from the year preceding this announcement. The selection of control variables mirrors that in our main estimation. Robust standard errors in parentheses and P-values in brackets. Standard errors clustered by industries.

Terminated M&A Deal Sample Pre-Matched Completed M&A			A Deal Sample				
Mean	SD	N	Mean	SD	N	<i>t</i> -stat	<i>p</i> -value
0.087	0.127	442	0.056	0.104	2,272	-5.599	0.000
Termin	Terminated M&A Deal Sample		Post-Matched	Completed M&	A Deal Sample		
Mean	SD	N	Mean	SD	N	<i>t</i> -stat	<i>p</i> -value
0.087	0.127	442	0.085	0.126	442	-0.276	0.782

Table A11: Comparison between Terminated and Completed M&A Sample on Deal-Arbitrage Risk (DAR)