

How does a partner's acquisition affect the value of the firm's alliance with that partner?

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Abstract

Research Summary: How does an acquisition initiated by a firm's alliance partner affect the value that the firm can create and capture from its alliance with that partner? We conjecture that the similarity between the businesses of the firm and its partner's acquisition target restricts the firm's ability to create and capture value from its alliance, whereas the complementarity between their businesses enhances the firm's gain from its alliance. We further expect relational embeddedness between the firm and its partner to mitigate the competitive tension associated with similarity while reinforcing synergies ascribed to complementarity. Our analysis of 361 firms and their 590 alliances with 91 partners that acquired 164 targets during 2000–2016 supports our predictions about business similarity and complementarity but refutes those concerning relational embeddedness.

Managerial Summary: When a firm's partner engages in an acquisition, this can impact the value of their alliance. We show that when the acquired target competes with the firm, the value of the alliance declines. In turn, when the target and firm's businesses

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are complementary, the alliance creates more value. We also find that when the firm and the partner had extensive experience working together, this reinforces the negative effect of business similarity with the target, probably because of perceived betrayal and knowledge leakage. Joint experience also reduces the value of complementarity, likely due to the difficulty of modifying collaborative practices. We encourage managers to scrutinize their partners' corporate initiatives, reduce commitment when the partner acquires a competing target, and leverage new complementarities following the partner's acquisitions.

KEYWORDS

acquisition, alliance, partner, value capture, value creation

1 | INTRODUCTION

Alliances and acquisitions both provide access to external resources, yet firms often disregard their interdependencies and rely on separate units to manage them (Dyer, Kale, & Singh, 2004). The respective research streams on alliances and acquisitions have evolved independently, with only a few studies examining their interplay. Most prior research on alliances has examined their potential value based on initial characteristics of the firm, its partner, and the alliance agreement (e.g., Merchant & Schendel, 2000). Even when studying how the value of an alliance evolves over time, the focus has been on the relational dynamics between the alliance partners (Ariño & de la Torre, 1998; Lunnan & Haugland, 2008; Reuer, Zollo, & Singh, 2002). We consider the implications of a partner's acquisitions for the firm's alliance with that partner.

Traditionally, scholars have considered alliances and acquisitions as alternative governance modes, alluding to the tradeoffs and choice between them (Capron & Mitchell, 2012; Villalonga & McGahan, 2005; Yang, 2005). Alliances are voluntary arrangements that enable independent partners to exchange resources as they jointly develop or provide products, services, or technologies (Gulati, 1998). They encompass non-equity agreements as well as joint ventures in which the partners invest and share ownership. In contrast, acquisitions entail the purchasing of a majority stake in a target firm by an acquirer, which then incorporates the acquired target as a unit in its organization (Villalonga & McGahan, 2005).

In studying the interplay between alliances and acquisitions, a growing body of research has considered how a firm's partnering experience influences the formation and performance of its subsequent acquisitions (Agarwal, Anand, Bercovitz, & Croson, 2012; Al-Laham, Schweizer, & Amburgey, 2010; Beckman & Haunschild, 2002; Porrini, 2004; Vanhaverbeke, Duysters, & Noorderhaven, 2002; Wang & Zajac, 2007; Yang, 2005; Zaheer, Hernandez, & Banerjee, 2010; Zollo & Reuer, 2010). Although this research has shed light on the effect of alliances on acquisitions, it does not explain how an acquisition initiated by a partner affects the firm's alliance with that partner.

A few studies have examined how a firm's ongoing alliance with a partner may be disrupted by the partner's acquisitions. This research suggests that when a firm's partner is acquired or merged, or acquires a target in the alliance's industry, this may cause dissatisfaction, reduced commitment, and termination of the alliance (Cui, Calantone, & Griffith, 2011; Xia, 2011).¹ Spedale, Van Den Bosch, and Volberda (2007) explore conditions that can lead to termination of the target's embedded relationships following its acquisition, pointing to how the acquisition process can affect trust, joint problem-solving, and information exchange. However, this research has limited its concern to alliance termination, without studying how the partner's acquisition affects the alliance's value. Moreover, prior research has mostly underscored the negative implications of acquisitions for alliances. Although a recent study has suggested that a partner's acquisition can improve the firm's access to network resources (Hernandez & Menon, 2018), this has not been tested empirically. A related study has demonstrated how an acquirer can create synergies by leveraging its target's network (Hernandez & Shaver, 2019), but has not examined the effect on the acquirer's alliances. Thus, the conditions under which an alliance partner's acquisition can benefit the firm remain unclear.

Our study examines how a partner's acquisition shapes the value created and captured by the firm given the nature of its association with the partner and the partner's acquisition target. Whereas the alliance research has primarily concentrated on dynamics in the firm-partner dyad, we shift our focus to interdependencies between the firm-partner dyad and the acquirer-target dyad. We acknowledge that some acquisitions undermine the value of alliances, while others enhance the value for a firm that allies with an acquiring partner. For example, when Microsoft acquired LinkedIn, Salesforce.com, an alliance partner of Microsoft, raised concerns that the "Microsoft-LinkedIn deal could hamper Salesforce's AI initiatives. Salesforce is feeling threatened by Microsoft's acquisition of LinkedIn" (Shields, 2016). In contrast, when Adobe acquired Marketo, a firm that provides a platform for marketing campaigns and lead management, it "announced an extended partnership with existing tech partner Microsoft that includes a new integration with LinkedIn and Marketo software" (Nicastro, 2019).

To elucidate the aftermath of the partner's acquisition, we distinguish business similarity from business complementarity (Wang & Zajac, 2007). We conjecture that business similarity between the firm and the acquisition target undermines value creation and capture in the firm's alliance with the partner, whereas business complementarity with that target generates value creation opportunities in the alliance. Although business similarity and complementarity have been studied in research on alliances and acquisitions (e.g., Chung, Singh, & Lee, 2000; Lin, Yang, & Arya, 2009; Yu, Umashankar, & Rao, 2016; Zaheer, Castañer, & Souder, 2013), our novelty is in considering their application in the association between a firm and its partner's acquisition target rather than in the formal relationship between the parties involved in the dyadic alliance or acquisition. To our knowledge, this has not been examined in prior research. Finally, we consider how the relational embeddedness between the firm and its partner, which has been shown to foster value creation in alliances (e.g., Lavie, Haunschild, & Khanna, 2012), sets a boundary condition that moderates the negative effect of business similarity with the target and the positive effect of their business complementarity.

¹Although not studying alliances, one study reports that a client is less likely to terminate an embedded relationship with an advertising firm following the firm's merger with another firm but is more likely to do so if the competitive tension with other clients increases following the merger (Rogan, 2014). Such a client tends to reduce its commitment to this firm (Rogan & Greve, 2015) given its concern about information leakage to other clients. These studies focus on termination rather than on value creation, and do not consider complementarity effects.

Using an event study methodology, we examine 164 acquisitions during the years 2000–2016 that were announced by 91 publicly traded software firms (i.e., partners) that formed 590 alliances with 361 focal firms. Our findings furnish support for the opposing effects of business similarity and complementarity with the target but counter the predictions relating to the moderating effects of relational embeddedness. One possible interpretation of these unexpected findings is that if a partner acquires a target that competes with the firm, this acquisition indicates the breakdown of trust in their embedded relationship and creates a risk of unintended knowledge spillover, which undermines the firm's ability to create and capture value from the alliance. Furthermore, we infer that relation-specific routines that typically facilitate value creation in embedded alliances (e.g., Dyer & Singh, 1998; Uzzi, 1996) can become dysfunctional, and their rigidity may prevent the firm from accessing and leveraging the complementary resources of the partner's acquisition target. Hence, our study revisits the received wisdom in studies of relational embeddedness, which has associated embeddedness with trust, knowledge exchange, and the use of efficient relation-specific routines in alliances.

Our study extends the relational view (Dyer & Singh, 1998; Dyer, Singh, & Hesterly, 2018), which has centered on value creation in alliances, by supplementing it with a value capture perspective (Lavie, 2006), and by considering interdependencies in triads of interfirm relations (Madhavan, Gnyawali, & He, 2004). We juxtapose different types of relations, namely alliances and acquisitions, and shift focus from a dyadic to a triadic perspective that acknowledges third-party effects of acquisitions by the firm's alliance partners. Hence, we contribute to research on alliances and acquisitions that has underscored either firm-partner or acquirer-target relations, while complementing the scant work on third-party effects of alliances (Oxley, Sampson, & Silverman, 2009). Our study further contributes by shedding light on the mechanisms that drive value creation and capture in these instances. In particular, we complement research on the detrimental effects of a partner's acquisition for its alliance relations (Cui et al., 2011; Rogan, 2014; Spedale et al., 2007; Xia, 2011) by revealing possible gains for its alliance network following the acquisition (Hernandez & Menon, 2018). Departing from prior research, we advance a contingency perspective that shows how a firm's business similarity with the partner's acquisition target undermines value creation and capture, while business complementarity with the target creates value in the alliance. Our study suggests that the notions of business similarity and complementarity have implications beyond the dyad, even when the parties lack direct ownership or contractual agreement.

Finally, our findings extend the relational view by revealing a dark side of relational embeddedness. We find that relational embeddedness attenuates the benefits of business complementarity while exacerbating the caveats of business similarity with the target following the partner's acquisition. These counterintuitive findings enhance our understanding of the nuanced interdependencies across the firm's various interfirm relations (Dyer et al., 2004; Rogan, 2014). They also inform the learning literature (e.g., Zollo & Winter, 2002) by suggesting that nurturing relation-specific routines can lead to rigidity that impedes knowledge exchange following the post-acquisition restructuring of an alliance relationship. This caveat is related neither to the relational dynamics in the alliance (Kim, Oh, & Swaminathan, 2006) nor to the firm's own corporate strategy (Hoffmann, 2007). Rather, this caveat emerges from the partner's corporate initiatives, which are difficult to observe and react to, and are typically disregarded by the firm's managers. Hence, managers should maintain relational flexibility and study the acquisitions undertaken by alliance partners with the aim of leveraging new synergies while neutralizing competitive threats arising from the evolving businesses of these partners.

2 | THEORY AND HYPOTHESES

Alliances enable a firm to create value by accessing network resources that lie beyond its boundaries (Lavie, 2006). However, its partners' businesses and resources change over time, so their contribution to value creation cannot be fully foreseen when the alliances are formed (Cui et al., 2011; Lunnan & Haugland, 2008). Specifically, when a firm's partner acquires a target, the partner gains immediate ownership of that target's business (Capron, Dussauge, & Mitchell, 1998). The resulting resource influx can benefit the firm by creating synergies that result from the combination of its resources with the complementary resources of the partner's acquisition target. Alternatively, the acquired target's business may substitute for the firm's contribution to the alliance. We contend that the extent to which the acquisition enhances or restricts the value that the firm can create and capture in its alliance with the partner depends on the similarity and complementarity between the businesses of the firm and the target, as well as on the relational embeddedness between the firm and its partner. Business similarity and complementarity are assumed to be associated with resource similarity and complementarity (e.g., Cui et al., 2011; Lin et al., 2009; Wang & Zajac, 2007). Drawing from the relational view (Dyer & Singh, 1998; Lavie, 2006), yet shifting focus from the firm's relationship with its partner to the firm's association with the partner's target, we relate business similarity and complementarity to the value that the firm creates and captures from an alliance following its partner's acquisition (see Figure 1). Our predictions cannot be derived from past research on alliances or acquisitions because they extend beyond the dyad to concern the firm and its partner's acquisition target, which do not maintain direct ownership nor a contractual relation between them.²

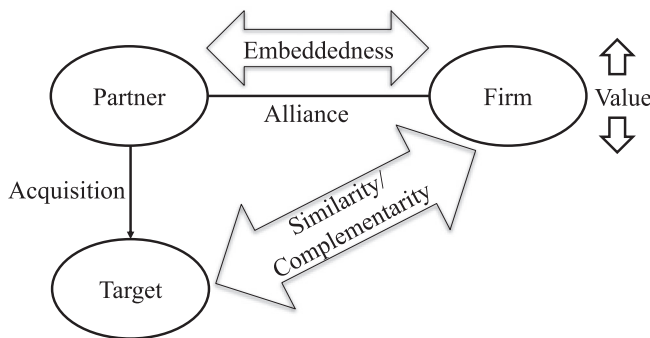


FIGURE 1 The triad of firm-partner-target relations

²In developing our theory, we assume that the partner's acquisition did not take place in reaction to the firm's alliance with that partner. Nevertheless, (a) it is possible that an acquisition by a partner reveals its deepened commitment to an area of business, and hence influences the partner's resource commitment to the alliance; (b) an acquisition of a similar business may imply that the firm could not deliver on its promise, so that the partner gradually replaces the relationship with the firm; (c) the partner's acquisition in a similar business may indicate a counterattack following the firm's preemptive competitive move against the partner; (d) the competitive tension between the firm and its partner may underpin the acquisition, which in turn exacerbates that tension; or that (e) the partner was aware of the possible adverse effect of its acquisition on the alliance, but still decided to undertake it. We later discuss these scenarios and their implications as well as attempt to address them empirically.

2.1 | Business similarity between the firm and its partner's acquisition target

When a firm's alliance partner acquires a target that operates in a business similar to that of the firm, the firm and the target are likely to possess similar resources and compete in the same product markets, which intensifies competitive tension with the partner (Chen, 1996; Wang & Zajac, 2007). Under such conditions, the acquisition may restrict the value that the firm can create and capture from its alliance with that partner.³ By acquiring a target in a business similar to that of the firm, the partner is likely to harm their alliance relationship. In consequence, the value of the alliance to the firm may diminish because of the partner's (a) reduced commitment, (b) increased bargaining power, and (c) reinforced competitive tension with the firm. First, the partner has a fiduciary duty and strong incentive to favor the target over the firm and ensure its welfare at the firm's expense if necessary. The greater the similarity between the businesses of the firm and the target, the more likely the target is to compete with the firm for the partner's resources and attention, which may prompt the partner to restrict its investments in the alliance (Singh & Mitchell, 1996). This reduced commitment limits the value of the alliance to the firm.

Second, the greater the business similarity between the firm and the acquisition target, the more the acquisition can substitute for some of the resources previously furnished by the firm, thus rendering the firm's resources less valuable to the partner. This, in turn, reduces the partner's dependence on the firm (Cui et al., 2011; Xia, 2011). As the partner becomes less dependent on the firm, it gains bargaining power and thus can negotiate more favorable terms and capture more value at the firm's expense (Khanna, Gulati, & Nohria, 1998; Lavie, 2007). This change in interdependence between the firm and its partner limits the firm's ability to capture value from its alliance with the partner. The firm may consequently incur losses due to outbound spillover rent (Lavie, 2006), which reduces the value of the alliance to the firm. Moreover, because the target becomes part of a larger entity and can leverage the resources and industry position of its acquirer in its competition with the firm, it can improve its competitive position vis-à-vis the firm (Oxley et al., 2009), which restricts the firm's ability to capture value.

Finally, greater similarity between the firm's and the target's businesses intensifies the competitive tension between the firm and the partner. Indeed, research on cooperation has documented the pursuit of private benefits and incidents of opportunistic behavior, knowledge leakage, and free riding of the partners, which endanger the stability of the alliance (e.g., Gnyawali & Park, 2009; Khanna et al., 1998). These counterproductive behaviors, which become pervasive with increased competition between the firm and its partner following the acquisition, not only constrain the parties' ability to create value (Arslan, 2018), but also endanger the firm's ability to capture value from its alliance (Lavie, 2006). As the tension intensifies, the firm and its partner are incentivized to improve their competitive positions vis-à-vis each other (Baum, Calabrese, & Silverman, 2000), and to compete away the other's share of value in their alliance (Lavie, 2007). In fear of this, the firm and its partner may more strongly protect their assets, which further hinders exchange and joint value creation in their alliance (Arslan, 2018; Kale, Singh, & Perlmutter, 2000). Overall, business similarity with the partner's target reduces the partner's commitment and limits the firm's bargaining power, while

³The partner's acquisition carries negative consequences to the firm regardless of whether the partner had already operated in or recently entered the firm's business domain, and its acquisition signifies a competitive move against the firm, a reaction to the firm's competitive move (Ferrier, 2001), or dissatisfaction with the firm's performance.

intensifying competitive tension in their alliance, thus restricting the firm's ability to create and capture value from the alliance.

Hypothesis (H1). *The greater the business similarity between the firm and its partner's acquisition target, the larger the decrease in the expected value of the alliance to the firm following the partner's acquisition of the target.*

2.2 | Business complementarity between the firm and its partner's acquisition target

Complementarity is a condition whereby combining one resource with another increases the marginal returns from that resource (Milgrom & Roberts, 1995). Business complementarity implies differences between firms' resources as well as interdependencies between them in a way that is mutually beneficial (Tanriverdi & Venkatraman, 2005; Wang & Zajac, 2007). For instance, when firms integrate their complementary knowledge, they can increase the number of jointly developed products that they introduce to the market (Rothaermel, Hitt, & Jobe, 2006). Business complementarity provides the parties with new opportunities for value creation in both acquisitions and alliances (Harrison, Hitt, Hoskisson, & Ireland, 2001), but scholars have yet to consider the complementarity between the firm and the partner's acquisition target.

When a firm's alliance partner acquires a target that operates in a business that complements the firm's own business, this may increase the value of the alliance to the firm due to (a) additional synergies, and (b) compensating for the firm's shortcomings. First, the firm may gain additional opportunities to create synergies in its alliance with that partner (Dyer & Singh, 1998; Tanriverdi & Venkatraman, 2005). If the firm gains access to the acquired resources of the target via its alliance with the partner, the firm can leverage some of the target's complementary resources and create more value in its alliance. We assume that the partner would encourage such additional synergies from which it can also benefit. It is in the partner's best interest to facilitate the interactions between the firm and the target under its ownership.

Second, besides creating new synergies, the target's complementary resources and capabilities can compensate for previous shortcomings in the alliance (Chung et al., 2000; Harrison et al., 2001). For example, in an alliance between an electronic circuit designer and its partner whose acquisition target provides semiconductor fabrication services, the parties can pool their complementary resources to efficiently produce more advanced products. Hence, the complementarity between the businesses of the firm and its partner's target can extend opportunities for enhancing value creation in the alliance and thus benefit the firm beyond the expected value of the alliance prior to the acquisition.

Hypothesis (H2). *The greater the business complementarity between the firm and its partner's acquisition target, the larger the increase in the expected value of the alliance to the firm following the partner's acquisition of the target.*

2.3 | Relational embeddedness between the firm and the partner

Relational embeddedness, which has been commonly studied in research on value creation in alliances (e.g., Dhanaraj, Lyles, Steensma, & Tihanyi, 2004; Lavie et al., 2012), refers to a

cohesive relationship built on social attachment and interpersonal ties (Greve, Baum, Mitsuhashi, & Rowley, 2010). It evolves with frequent and repeated interactions with a partner and supports coordination and learning of specialized knowledge (Granovetter, 1985; Uzzi, 1996). Although over-embeddedness can constrain a firm's adaptability when conditions change, the literature mostly underscores the virtues of relational embeddedness in alliances, while focusing on its direct impact on value creation (Dyer & Singh, 1998). We extend this view by considering the moderating effect of relational embeddedness. We have established that business similarity between the firm and its partner's target can undermine the value of the alliance. However, these negative consequences can become weaker when the firm and its partner are relationally embedded.

In particular, the more embedded their relationship, the more likely the partner is to dedicate resources to its alliance with the firm (Sorenson & Waguespack, 2006). Such relation-specific investments are often not salvageable (Parkhe, 1993), which makes it costly to the partner to reduce its commitment to the alliance despite the firm's competition with the target. Moreover, although the partner's relative bargaining power is likely to increase when the target and firm operate similar businesses (Xia, 2011), the partner may not exercise this power in an embedded relationship because of its perceived value and the strong personal ties between the alliance's managers. Hence, because an embedded relationship incurs lower transaction costs and is more valuable to the partner (Dyer & Chu, 2003; Gulati, 1995), the partner would refrain from leveraging its power to restrict the firm's share of value (Piskorski & Casciaro, 2006).

Finally, the more embedded the alliance relationship, the less tension prevails following the acquisition. The firm is likely to be less concerned about possible leakage of resources to a competitor via its alliance when the firm and its partner maintain an embedded relationship that facilitates cooperation, conflict resolution (Madhok, 2006), and trust (Gulati, 1995). Mutual trust enables the parties to overcome their differences despite the competitive tension associated with business similarity. In an embedded relationship, the firm and its partner expect the other party to act evenhandedly despite possible opportunism (Zaheer, McEvily, & Perrone, 1998) following the partner's acquisition of a target that competes with the firm. In such a relationship, the firm and its partner are also more likely to avoid unauthorized use of each other's resources (Krishnan, Martin, & Noorderhaven, 2006), thus safeguarding the firm's assets despite the partner's acquisition. The greater the embeddedness between the firm and its partner, the less severe the ramifications of the business similarity with the partner's target.

Hypothesis (H3). *The negative effect of the business similarity between the firm and its partner's acquisition target will become weaker as the relational embeddedness between the firm and the partner increases.*

Relational embeddedness can also reinforce the benefits of business complementarity between the firm and its partner's acquisition target. We asserted that complementarity between a firm and its partner's target contributes to joint value creation, but such value can be realized only if the firm and its partner have aligned their processes and systems in a way that supports coordination (Dyer & Singh, 1998; Lavie et al., 2012). This is indeed the case when the firm and its partner have nurtured an embedded relationship. Relational embeddedness tends to evolve in recurrent alliances and supports the development and refinement of relation-specific routines for knowledge exchange (Holloway & Parmigiani, 2016; Uzzi, 1996; Zollo, Reuer, & Singh, 2002). Relational embeddedness can thus help the firm and its partner identify valuable synergies and learning opportunities (Oxley et al., 2009), and facilitate the firm's ability

to access and leverage the complementary resources of the partner's acquisition target while reducing coordination costs (Andersen, 2013). By relying on embeddedness, the firm can recognize who possesses complementary assets in the partner's extended organization and use efficient communication and standard procedures to access these resources (Gulati, Lavie, & Singh, 2009; Uzzi, 1996). The greater the relational embeddedness between the firm and its partner, the better their ability to share and exchange fine-grained information and tacit knowledge (Reagans & McEvily, 2003) that support the evaluation and deployment of complementary resources of the partner's acquisition target. As a result, relational embeddedness reinforces the benefits of business complementarity with the target.

Hypothesis (H4). *The positive effect of the business complementarity between the firm and its partner's acquisition target will become stronger as the relational embeddedness between the firm and the partner increases.*

3 | METHODS

3.1 | Sample and data

We tested our hypotheses with data on publicly traded firms and their U.S.-based publicly traded alliance partners that operated in the software industry (Standard Industry Classifications (SICs) 7371–7374). The sample included all the partners that acquired publicly traded targets during 2000–2016.⁴ However, we restricted the sample to firms with a sufficient number of records in Compustat and available stock price information in CRSP. This setting is suitable given the prevalence of alliances and acquisitions in the software industry (Stettner & Lavie, 2014). The high proportion of publicly traded firms in the software industry mitigates potential age- and size-related biases (Lavie, 2007). The sampled firms were operating in 80 four-digit SICs, with 62.60% non-software firms. The acquired targets were operating in 32 SICs, with 34.15% non-software targets.

To construct our dataset, we first used the SDC Platinum database to identify acquisitions completed by U.S.-based publicly traded software firms that acquired publicly traded targets between January 1, 2000, and December 31, 2016. We limited our sample to acquisitions in which the acquirers owned at least 50% of the targets (Villalonga & McGahan, 2005). Next, we used the SDC database to identify public firms that had active alliances with these acquirers at the time of the announced acquisition. Because alliance termination dates are rarely reported, we assumed an alliance duration of 3 years, which is typical of the software industry (Lavie, 2007; Schilling & Phelps, 2007). We traced alliances that the acquirers formed in the 3 years preceding the date of each acquisition, starting from 1997.⁵ The dyad-event served as our unit of analysis, corresponding to the alliance between the acquirer and a firm at the time

⁴We included all types of alliances but focused on publicly traded firms, partners, and targets to ensure available information in SEC filings and press coverage of the alliances and acquisitions. This is required for measuring business similarity and complementarity and the cumulative abnormal returns. Publicly available information on alliances and acquisitions involving privately held entities may be insufficient for investors' assessments. We expect the ramifications of the acquisitions to be stronger for privately held firms and weaker for private targets.

⁵We dropped records of acquirers that had no active alliances with other public firms. Listwise deletion was applied to handle missing data in stock market returns (16.12%) and R&D expenses (10.36%). We coded alliance data based on the SDC database and the alliance announcements extracted from the Factiva database. Multi-party alliances (24.29% of the observations) were decomposed to dyads.

of an acquisition event. Our sample consists of 1,008 observations relating to 361 public firms that formed 590 alliances with 91 U.S.-based public software partners, which in turn acquired 164 public targets. Each observation is defined by a unique combination of a focal firm, its alliance partner, and an acquisition made by that partner.⁶ We collected data from Compustat on firm SIC codes, assets, cash, long-term debt, R&D expenses, net income, and outstanding shares at the time of acquisition. Data on stock prices were gathered from CRSP. Business descriptions of software firms at the year of acquisition were gathered from Edgar 10-K SEC forms.

3.2 | Measures

3.2.1 | Dependent variable: Change in alliance value

We adopted the event study methodology to examine the potential change in the firm's value of the alliance following its partner's acquisition of the target. The dependent variable is measured by the firm's cumulative abnormal return (CAR) around the announcement of the partner's acquisition. Investors make inferences from press announcements about the prospects of the alliance (Ndofor & Levitas, 2004; Stuart, Hoang, & Hybels, 1999), and the firm's stock price reflects their reactions to the available information (Koh & Venkatraman, 1991; Park & Kim, 1997).⁷ Our CAR measure reflects the investors' expectations about the added value that the alliance will potentially create for the firm following the acquisition, including reputational and perceptual gains. Unlike financial performance measures such as Return on Assets (ROA), it can isolate the effect of an acquisition from other confounding events that affect performance. We assume that investors can access publicly available information on relevant aspects of the alliance and the acquisition to assess the change in the alliance's value (Wassmer & Dussauge, 2012).

We used residual analysis of the market model to calculate CAR (Fama, Fisher, Jensen, & Roll, 1969) using a two-day event window $[-1,0]$, with the date of the partner's acquisition announcement set to $t = 0$.⁸ To control for temporal trends in the capital market, we estimated the market model for a period of 250 days during $t = [-260, -11]$: $r_{it} = \alpha_i + \beta_i r_{mt} + \varepsilon_{it}$, where r_{it} is the stock return of firm i on day t , r_{mt} is the daily market return on the equal-weighted S&P 500 (Wassmer & Dussauge, 2012), α_i and β_i are firm-specific parameters, and ε_{it} is the error term. Then, we used the resulting estimates $\hat{r}_{it} = \hat{\alpha}_i + \hat{\beta}_i r_{mt}$ to predict the daily abnormal returns in percentage for firm i over the two-day window: $CAR_i = \sum_t \hat{\varepsilon}_{it}$, where $\hat{\varepsilon}_{it} = r_{it} - \hat{r}_{it}$, with t ranging from -1 to 0 (Findikoglu & Lavie, 2019; Gulati et al., 2009).

⁶34.07% of the partners acquired more than one target, while 30.47% of the firms formed more than one alliance with an acquiring partner. As a result, 46.81% of the firms were impacted by more than one acquisition during the timeframe of our study, with each acquisition, on average, impacting 5.43 firms.

⁷CAR is a commonly used measure of the expected value created by an alliance (e.g., Anand & Khanna, 2000; Kale, Dyer, & Singh, 2002; Liu & Ravichandran, 2015; Merchant & Schendel, 2000; Park & Mezas, 2005; Reuer & Koza, 2000; Wassmer & Dussauge, 2012). It is an *ex ante* market performance measure that is highly correlated with managers' *ex post* assessments of alliance performance (Kale et al., 2002; Koh & Venkatraman, 1991).

⁸A two-day window is standard in alliance research (e.g., Gulati et al., 2009; Oxley et al., 2009; Yang et al., 2015). It is sufficient for capturing the announcement's effect. Although we assume that investors are uninformed prior to the announcement, this window accounts for possible leakage of information, while excluding unrelated events (e.g., Findikoglu & Lavie, 2019; Wassmer & Dussauge, 2012).

3.2.2 | Independent variables

Business similarity between the firm and the partner's acquisition target was calculated based on their primary SIC codes (Robins & Wiersema, 2003; Sukoco, 2015; Wang & Zajac, 2007). When at least one of the parties did not operate in the software industry, the measure took the value of " $\frac{2}{3}$ " if the four-digit SIC of the firm matched that of the target, " $\frac{1}{2}$ " if only the first three digits matched, " $\frac{1}{3}$ " if only the first two digits matched, " $\frac{1}{6}$ " if only the first digit matched, and "0" otherwise. For a firm and a target operating in the software industry, we also relied on their business descriptions in their 10-K SEC forms to classify their software products. We used a typology that covers 54 product segments in four product classes: personal applications, system infrastructure, vertical applications, and business applications (Naumovska & Lavie, 2021; Stettner & Lavie, 2014; Zahavi & Lavie, 2013). Two trained coders identified the product segments using category descriptions. Inter-rater reliability reached 90.15%, with disagreements resolved via deliberation. Because the firm and the target could operate in multiple product segments in this industry, this variable took the value of $\frac{2}{3} + \frac{1}{6} \left(\frac{N_{CF} \cap N_{CT} + N_{SF} \cap N_{ST}}{N_F + N_T} \right)$, where $N_{CF} \cap N_{CT}$ and $N_{SF} \cap N_{ST}$ correspondingly indicate the number of product classes and product segments in which both the firm and the target operate, with N_F and N_T corresponding to the firm's and the target's number of product segments in the software industry. The variable ranged between 0 and 1, with a higher value indicating greater similarity.

Business complementarity requires that the combination of the firm's and the target's businesses can create potential synergies (Gimeno, 2004; Tanriverdi & Venkatraman, 2005). Following Wang and Zajac (2007), we assume that businesses are more complementary when they co-occur within the same firm. Hence, based on the entire Compustat database, we first computed a complementarity score for any pair of four-digit SIC codes i and j as $Comp_{ij} = (J_{ij} - \mu_{ij}) / \delta_{ij}$, where J_{ij} is the number of times that two SIC codes appear in a firm, $\mu_{ij} = (N_i \times N_j) / K$, where N_i is the number of firms in SIC code i and N_j is the number of firms in SIC code j , K is the total number of firms, and $\delta_{ij} = \sqrt{\mu_{ij} \times \left(1 - \frac{N_i}{K}\right) \times \left(\frac{K}{K-1}\right) \times \left(1 - \frac{N_j}{K}\right)}$. Next, because some firms have both primary and secondary SICs, the business complementarity between a firm and a target was measured as $\sum_{ij} Comp_{ij} \times p_i \times p_j$, where $Comp_{ij}$ is the complementarity score of each pair of SIC codes of firm i and target j , while p_i and p_j are the corresponding weights of the codes calculated as 1 divided by the number of SIC codes that the firm and the target have, respectively (Wang & Zajac, 2007). To enhance accuracy, when both the firm and the target operated in the software industry, we supplemented their complementarity score with the term $\left(\frac{N_{CF} \cap N_{CT} - N_{SF} \cap N_{ST}}{N_F + N_T} \right)$, which captures the proportion of the parties' distinct product segments within the same product class. Overall, a high value of this measure indicates greater complementarity between the businesses of the firm and those of its partner's acquisition target.

3.2.3 | Moderating variable

Relational embeddedness between the firm and its partner was proxied by their joint partnering experience (Gulati, 1995; Gulati et al., 2009), measured as the accumulated number of alliances between them prior to the acquisition announcement. Each prior alliance was weighted by its intensity, which implies greater resource commitment and interdependence between the firm and

the partner (Zaheer et al., 2010). The intensity of the alliance relationship was captured by the standardized number of different types of alliance agreements signed between the parties.⁹

3.2.4 | Control variables

Following prior research, we controlled for organizational and relational factors that may affect the expected value of the firm's alliance. First, we accounted for the *R&D intensity* of the firm, its alliance partner, and the acquisition target, measured as R&D expenses divided by revenue in the pre-acquisition year (King, Slotegraaf, & Kesner, 2008; Lavie, 2007). A high R&D intensity reduces dependence, which can affect the firm's gains from the alliance. Next, we controlled for the *relatedness* of the acquisition, acknowledging that unrelated acquisitions impose integration and control challenges (Zorn, Sexton, Bhussar, & Lamont, 2019). We measured acquisition relatedness using the same formula as was used for calculating the business similarity between the firm and the partner's acquisition target.

Next, we accounted for relational characteristics of the alliance. These characteristics included the *governance* structure of the alliance, distinguishing an equity alliance (coded "1") from a non-equity alliance (coded "0"). An equity alliance can secure the partner's commitments (Gulati, 1995) and enable the firm and its partner to operate in a similar business with less competitive tension, thus contributing to the value of the alliance. We also controlled for the *value chain function* of the alliance, with a variable coded "1" for an upstream alliance involving an R&D agreement, "0" for a downstream alliance involving marketing and service, OEM/VAR, licensing, production, or supply agreement, and "0.5" if the alliance combined upstream and downstream agreements (Lavie & Rosenkopf, 2006). We controlled for the type of alliance, distinguishing link from scale alliances (Dussauge, Garrette, & Mitchell, 2000). The synergies made available via link alliances may create more value to the firm.¹⁰ The *scale/link alliance* measure was constructed by dividing the number of activities in which both parties engaged by the sum of unique activities in which each party engaged in the announced alliance, ranging from 0 for a pure link alliance to 1 for a pure scale alliance. The raters also indicated whether this was a *multi-party alliance*, which typically exhibits complex dynamics such as freeriding that influence value creation (Fonti, Maoret, & Whitbred, 2017).

The relative bargaining power of the firm vis-à-vis its partner increases the firm's ability to capture value from its alliance (Lavie, 2006). We operationalized this with the firm's profitability and number of alternative alliances relative to the partner (Lavie, 2007). The *relative profitability* was measured as the difference between the firm's ROA and the partner's ROA in the preceding year, standardized by the mean ROA in their four-digit SIC, that is: (firm ROA – mean ROA in firm's industry) – (partner ROA – mean ROA in partner's industry). The *relative alternatives* measure was calculated using Compustat, as the ratio of the number of listed firms in the partner's four-digit SIC to the number of listed firms in the firm's four-digit SIC in the year of the acquisition.

Finally, we controlled for the characteristics of the association between the firm and its partner's acquisition target. The *relative status* was measured as the ratio of the target's status to the firm's status, based on their ranking in the Forbes Global 2000 list, which annually ranks the

⁹Types of alliances include licensing, manufacturing, marketing and service, original equipment manufacturer/value-added resale (OEM/VAR), R&D, and supply, as coded in the SDC database (Lavie, 2007).

¹⁰Two raters carefully read the press items relating to the announced alliances and coded each partner's asset contributions and value chain activities relating to R&D, marketing, and manufacturing. Inter-rater reliability reached 93.65%, with disagreements resolved via deliberation.

TABLE 1 Descriptive statistics and pairwise correlations ($N = 1,008$)

Variable	Mean	SD	Min	Max	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1. Firm CAR	-0.009	0.069	-0.674	0.553																
2. Firm R&D intensity	0.151	0.719	0.000	21.168	-0.053															
3. Partner R&D intensity	0.195	0.178	0.000	3.848	0.058	0.017														
4. Target R&D intensity	0.404	1.601	0.000	20.084	-0.021	0.001	0.007													
5. Acquisition relatedness	0.619	0.278	0.000	1.000	-0.111	0.011	-0.073	0.087												
6. Alliance governance	0.117	0.322	0.000	1.000	0.036	-0.044	0.058	-0.048	-0.087											
7. Value chain function	0.030	0.168	0.000	1.000	0.021	-0.006	-0.020	-0.000	-0.030	-0.029										
8. Scale/link alliance	0.681	0.401	0.000	1.000	-0.025	0.033	-0.042	-0.014	-0.056	0.033	0.118									
9. Multi-party alliance	0.226	0.419	0.000	1.000	0.013	-0.051	-0.035	-0.067	-0.046	0.386	-0.027	0.083								
10. Firm-partner profitability	-0.300	10.027	-15.273	114.665	0.017	-0.003	0.004	-0.006	-0.095	-0.037	-0.022	0.009	-0.048							
11. Firm-partner alternatives	12.270	21.891	0.055	160.000	-0.012	-0.069	0.016	-0.027	0.047	0.050	0.110	0.045	0.107	-0.085						
12. Target-firm status	0.848	3.192	0.001	57.448	-0.066	0.023	-0.002	-0.013	-0.018	-0.028	0.008	-0.061	-0.035	-0.017	-0.065					
13. Target-firm embeddedness	0.007	0.097	0.000	2.000	-0.013	-0.008	-0.022	-0.011	-0.102	-0.017	-0.013	0.041	0.050	-0.012	0.050	-0.016				
14. Firm-partner embeddedness	0.229	0.559	0.000	4.000	-0.031	-0.030	-0.054	-0.044	0.035	0.015	0.027	0.147	0.272	0.002	0.168	-0.053	0.026			
15. Firm-target similarity	0.263	0.308	0.000	1.000	-0.088	0.049	0.006	0.053	0.247	-0.211	-0.086	-0.028	-0.194	-0.021	-0.362	0.096	0.026	-0.135		
16. Firm-target complementarity	3.696	4.266	-5.131	19.628	-0.005	0.015	-0.013	0.017	0.244	-0.213	-0.123	-0.055	-0.095	-0.011	-0.175	0.014	0.030	0.048	0.443	

Abbreviation: CAR, cumulative abnormal return.

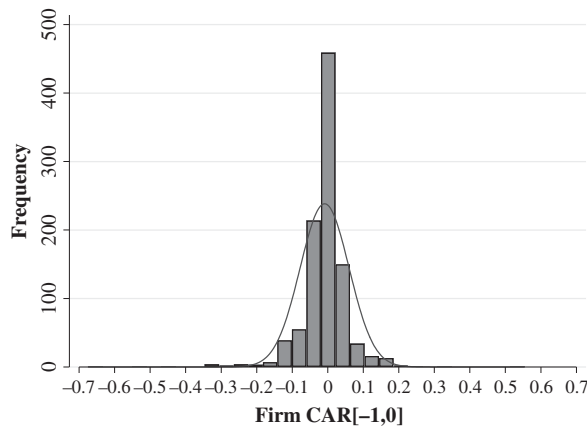


FIGURE 2 Distribution of firms' cumulative abnormal returns (CAR)

world's 2,000 largest public firms.¹¹ The target's status relative to the firm may create reputational spillover to the firm via its alliance with the partner (Lin et al., 2009; Washington & Zajac, 2005). We also accounted for the *relational embeddedness* between the firm and the target, measured as the number of prior alliances between them, weighed by the intensity of their alliance relationship. If the firm and the target have an embedded relationship, indirect resource flows between them are probable, unless the partner acts as a broker and disconnects their direct relationship. Finally, we controlled for *inter-industry variation* by studying a single industry of the partners, and for *inter-temporal trends* by standardizing the dependent variable by the S&P 500 index over 250 days.

3.3 | Analysis

A partner's acquisition is not a random event. To account for systematic sample truncation due to the partner's decision to acquire, we specified a two-stage model that accounts for sample selection in the first-stage model. Despite following recommended practices for model specification and efforts to validate the exclusion restriction variables (Certo, Busenbark, Woo, & Semadeni, 2016), the inverse Mills ratio in the second-stage model produced no effect. Thus, we took a conservative approach and report a single-stage model (Wolfolds & Siegel, 2019).

Table 1 presents descriptive statistics and pairwise correlations, revealing an average CAR of -0.88% for the sampled firms, which corresponds to a value of $-\$280.23\text{M}$. As evidenced in Figure 2, firms' CARs are almost evenly distributed around 0. The partners' average CAR is -1.46% , while the targets' average CAR is 26.04% , in line with prior research (Capron & Pistre, 2002; Carow, Heron, & Saxton, 2004). We found no symptoms of multicollinearity, and correlations between variables were relatively low. The maximum variance inflation factor (VIF) in the full model (Model 5) reached 3.24, below the threshold level (Hair, Black, Babin, & Anderson, 2010). We test our hypotheses with ordinary least squares regression, regressing CAR on the explanatory variables, with robust standard errors clustered on both the partner and acquisition event (Kleinbaum, Stuart, & Tushman, 2013).

¹¹Because Forbes initiated the listing in 2003, we used the 2003 list for assessing firms' status in the years 2000–2002. If a firm was not listed, its assigned rank was set to twice the lowest ranking of sampled firms in that year.

4 | RESULTS

Table 2 reports the results of hierarchical models. The full model (Model 5) served for testing our hypotheses. This model shows that the potential value of the alliance following the partner's acquisition increases with the relational embeddedness between the firm and the partner, which can be associated with trust, commitment, and knowledge exchange in the alliance (Dyer & Singh, 1998; Gulati et al., 2009; Zollo et al., 2002). In turn, the expected value of the alliance declines with the firm's R&D intensity, which may reflect investors' concerns about potential knowledge leakage to the target (Oxley & Sampson, 2004). For a similar reason, the expected value of the alliance is positively related to the partner's R&D intensity. The relative availability of alternative alliances to the firm negatively impacts the potential value of the alliance, perhaps because the firm may reduce its commitment to the alliance in question (Greve, Mitsubishi, & Baum, 2013). Finally, relational embeddedness between the firm and the target reduces the alliance's value following the acquisition, possibly because the partner steps in as a broker in this node collapse (Hernandez & Shaver, 2019).

The results of Model 5 reveal that, in accordance with Hypothesis 1, the similarity of the businesses of the firm and the target negatively impacts the post-acquisition value of the firm's alliance with the partner. For every 1 *SD* change in their business similarity, CAR declines by 0.69%. Consistent with Hypothesis 2, Model 5 shows a positive effect of the business complementarity between the firm and the target on the value of the alliance. For every 1 *SD* change in their business complementarity, CAR increases by 0.82%. Contrary to Hypothesis 3, however, the moderating effect of firm-partner embeddedness on the association between the firm's CAR and the firm-target similarity is negative. Figure 3 presents this interaction effect, showing a reinforced decline in CAR as a function of business similarity with the target. A possible explanation is that when the alliance is embedded, investors expect it to be extended or to evolve into a merger (Hagedoorn & Sadowski, 1999). Hence, the unfulfilled expectation may send a negative signal to the market. The partner's acquisition of another similar target may be seen as a betrayal of trust or failure of the relationship with the firm (Rogan, 2014). Another possible explanation is that as their embedded relationship evolves, the firm may have shared sensitive information with the partner that, if leaked to a competitor, can severely affect the firm's business (Rogan, 2014). Thus, counter to our prediction, the partner's acquisition of a target that operates in a similar business to that of the firm is viewed as more detrimental to the firm's alliance despite, and perhaps because of, its embedded relationship with the partner.

Similarly, counter to Hypothesis 4, the results of Model 5 reveal that the firm-partner embeddedness negatively moderates the association between the firm-target complementarity and the value created by the firm's alliance. Figure 4 presents this interaction effect, showing that the firm's gain from its business complementarity with the target decreases when the firm and the partner have an embedded relationship. A possible explanation for this surprising finding is that the firm and the partner may have developed relation-specific routines through their past interactions (Gulati et al., 2009), which solidify over time as they are repeatedly employed (Nelson & Winter, 1982). To leverage emerging opportunities arising from business complementarity with the partner's acquisition target, the firm and the partner need to modify these routines, for example, those relating to accessing and sharing knowledge (Dyer & Singh, 1998). This becomes more challenging given the rigidity ascribed to the relation-specific routines that have evolved in the embedded relationship with the partner (Zheng & Yang, 2015). An attempt to modify these established routines can undermine the accessibility of previously available partner assets and risk existing complementarities with the partner. Thus, counterintuitively, the firm and its partner's embedded relationship may constrain the adaptation of their

TABLE 2 Hierarchical regression model for firm CAR

Dependent variable: firm CAR	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Firm-target similarity		-0.016 (0.009) [.087]	-0.021 (0.008) [.012]	-0.018 (0.007) [.012]	-0.022 (0.009) [.019]	-0.018 (0.015) [.249]	-0.020 (0.017) [.237]	-0.022 (0.010) [.032]
Firm-target complementarity			0.001 (0.001) [.065]	0.001 (0.001) [.095]	0.002 (0.001) [.001]	0.001 (0.001) [.084]	0.001 (0.001) [.101]	0.002 (0.001) [.005]
Firm-target similarity × firm-partner embeddedness				-0.018 (0.011) [.102]	-0.028 (0.014) [.041]	-0.049 (0.009) [.000]	-0.041 (0.011) [.000]	-0.028 (0.010) [.004]
Firm-target complementarity × firm-partner embeddedness					-0.005 (0.000) [.000]	-0.004 (0.000) [.000]	-0.004 (0.000) [.000]	-0.005 (0.000) [.000]
Firm-partner embeddedness	-0.003 (0.002) [.076]	-0.004 (0.002) [.039]	-0.005 (0.002) [.008]	-0.003 (0.002) [.101]	0.021 (0.002) [.000]	0.021 (0.001) [.000]	0.021 (0.001) [.000]	0.021 (0.003) [.000]
Firm R&D intensity	-0.005 (0.002) [.046]	-0.005 (0.002) [.031]	-0.005 (0.002) [.030]	-0.005 (0.002) [.032]	-0.005 (0.002) [.036]	-0.005 (0.003) [.063]	-0.005 (0.003) [.074]	-0.005 (0.003) [.074]
Partner R&D intensity	0.018 (0.009) [.052]	0.019 (0.009) [.038]	0.019 (0.009) [.029]	0.019 (0.009) [.028]	0.020 (0.009) [.023]	0.020 (0.009) [.023]	0.020 (0.009) [.025]	0.020 (0.009) [.025]
Target R&D intensity	-0.001 (0.001) [.446]	-0.001 (0.001) [.459]	-0.001 (0.001) [.516]	-0.001 (0.001) [.476]	-0.001 (0.001) [.425]	-0.001 (0.001) [.425]	-0.001 (0.001) [.647]	-0.001 (0.001) [.647]
Acquisition relatedness	-0.026 (0.017) [.126]	-0.022 (0.015) [.156]	-0.024 (0.015) [.115]	-0.025 (0.015) [.116]	-0.020 (0.013) [.123]	-0.020 (0.013) [.123]	-0.020 (0.013) [.126]	-0.020 (0.013) [.126]
Alliance governance	0.004 (0.006) [.520]	0.002 (0.007) [.794]	0.004 (0.007) [.628]	0.005 (0.007) [.507]	0.005 (0.006) [.428]	0.003 (0.006) [.634]	0.005 (0.007) [.444]	0.005 (0.007) [.444]

TABLE 2 (Continued)

Dependent variable: firm CAR	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
Value chain function	0.010 (0.009) [.242]	0.009 (0.008) [.267]	0.011 (0.008) [.143]	0.012 (0.008) [.118]	0.010 (0.008) [.194]	0.010 (0.007) [.174]		0.010 (0.008) [.201]
Scale/link alliance	-0.005 (0.005) [.251]	-0.005 (0.005) [.300]	-0.004 (0.005) [.363]	-0.005 (0.005) [.316]	-0.005 (0.005) [.294]	0.001 (0.005) [.831]		-0.005 (0.005) [.291]
Multi-party alliance	0.002 (0.004) [.689]	0.001 (0.004) [.854]	0.001 (0.004) [.862]	0.001 (0.004) [.890]	0.003 (0.004) [.521]	0.009 (0.003) [.004]		0.003 (0.005) [.556]
Firm-partner profitability	0.000 (0.000) [.494]	0.000 (0.000) [.608]	0.000 (0.000) [.601]	0.000 (0.000) [.585]	0.000 (0.000) [.596]	0.000 (0.000) [.000]		0.000 (0.000) [.600]
Firm-partner alternatives	-0.000 (0.000) [.538]	-0.000 (0.000) [.074]	-0.000 (0.000) [.099]	-0.000 (0.000) [.068]	-0.000 (0.000) [.013]	-0.000 (0.000) [.048]		-0.000 (0.000) [.003]
Target-firm status	-0.002 (0.001) [.086]	-0.001 (0.001) [.131]	-0.001 (0.001) [.152]	-0.001 (0.001) [.133]	-0.001 (0.001) [.149]	-0.001 (0.000) [.003]		-0.001 (0.001) [.163]
Target-firm embeddedness	-0.015 (0.006) [.006]	-0.012 (0.004) [.004]	-0.013 (0.004) [.002]	-0.012 (0.003) [.001]	-0.009 (0.003) [.003]	-0.002 (0.003) [.509]		-0.009 (0.004) [.017]
Acquisition fixed effects						Included	Included	
Constant	0.010 (0.008) [.191]	0.012 (0.008) [.140]	0.011 (0.009) [.233]	0.011 (0.009) [.227]	0.006 (0.007) [.447]	0.002 (0.007) [.823]	-0.000 (0.007) [.973]	0.006 (0.008) [.457]
R^2	0.0257	0.0294	0.0327	0.0335	0.0547	0.1849	0.1767	0.0547
F	5.17	7.7	5.98	11.96	210.38	1.45	1.49	210.38
N alliance-acquisition events	1,008	1,008	1,008	1,008	1,008	961	961	1,008

Note: Clustered SE in parentheses, with p -values in brackets. Abbreviation: CAR, cumulative abnormal return.

relation-specific routines, and hence impede synergies linked to the extended business complementarity between the firm and its partner, and, in particular, to the firm's complementarity with the acquired target.

We conducted several supplementary analyses. Specifically, to account for remaining unobserved heterogeneity we included acquisition fixed effects while excluding controls relating to the acquirer, the target, and the acquisition (Model 6). This model produced consistent findings. Similar findings were obtained when retaining these fixed effects and excluding all control variables (Model 7).¹² Finally, we incorporated a three-way clustering of standard errors, accounting for interdependencies at the firm, partner, and acquisition levels (Kleinbaum et al., 2013), which left our findings intact (Model 8).

4.1 | Robustness tests

We conducted several robustness tests. First, we tested alternative event windows for our dependent variable, but *t*-tests revealed returns only for the $[-1,1]$ window, suggesting quick information dissemination. We found consistent results for event windows around this range. Second, we found no evidence of quadratic effects of business similarity and complementarity. Third, we considered an alternative measure of business similarity based on the proportion of primary and secondary four-digit SICs of the firm and the target, obtaining stronger results for the main effect (Hypothesis 1) and moderated effect (Hypothesis 3). Fourth, we used an unweighted measure of relational embeddedness based on the number of prior alliances, which yielded stronger results for the main effect of relational embeddedness and its moderating effects (Hypotheses 3 and 4). Measuring relational embeddedness as the proportion of different types of agreements did not yield results, suggesting that the findings relating to relational embeddedness are driven mostly by joint partnering experience.

Fifth, we added controls to better isolate the mechanisms. We controlled for (a) the solvency and diversification of the firm, its partner, and target, (b) for the firm's and its partner's status and the size of alliance portfolios, (c) for the partner's acquisition experience¹³ and CAR around the time of acquisition, (d) for the alliance's age and whether its duration was preset, (e) for the strategic importance of the alliance and for the distance in miles between the firm's and the partner's headquarters locations, (f) for whether the firm and its partner, as well as the firm and the target, originate from different countries, (g) for the business similarity between the firm and its partner, (e) for whether the alliance was unilateral or bilateral and for the number of partners in multi-party alliances, (f) for the extent of ownership of the partner in the target and the acquisition payment method, (g) for whether it was a cross-border acquisition, (h) for the relative size of the partner vis-à-vis its acquisition target and the firm, and (i) for the firm's own acquisitions during the time elapsing between the formation of its alliance with the partner and the partner's acquisition of the target. These controls yielded no effects and there was no

¹²In these models, we observe no coefficient sign flips for our explanatory variables (Kalnins, 2018), but some meaningful variation is removed (Gormley & Matsa, 2014). Moreover, 47 out of the 164 acquisitions are dropped from the fixed effect models because they correspond to only one alliance record. This nonrandom loss of observations could introduce a bias (Farkas, 2005).

¹³When replacing the control for the partner's prior acquisitions with two controls for the prior acquisitions within and outside the target's business domain, neither affected the firm's CAR. Replacing this control with the size of the partner's acquisition portfolio also had no effect on CAR. However, a control for the size of the firm's acquisition portfolio positively affected CAR. In all cases, our findings remained unchanged.

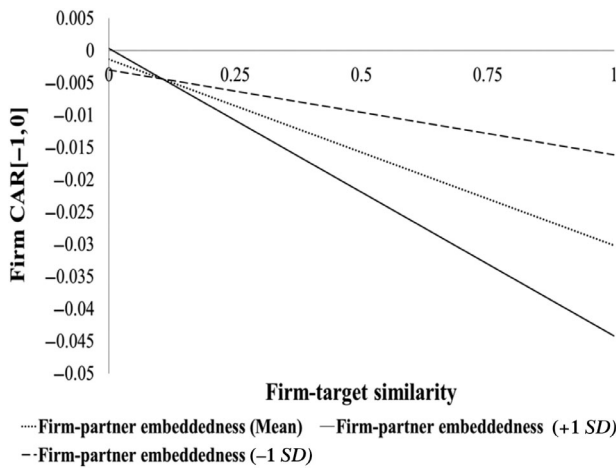


FIGURE 3 Firm cumulative abnormal return (CAR) by firm-target similarity and firm-partner embeddedness

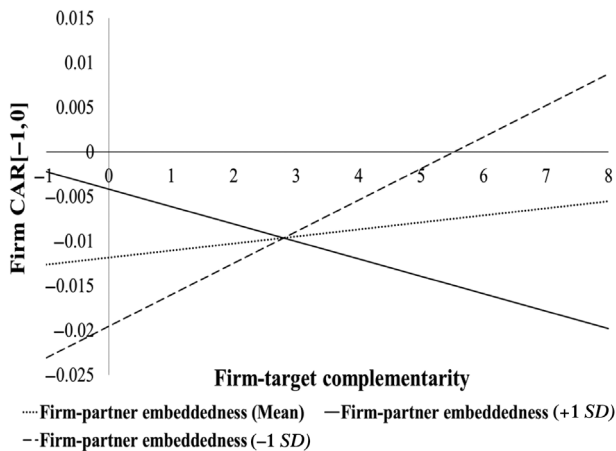


FIGURE 4 Firm cumulative abnormal return (CAR) by firm-target complementarity and firm-partner embeddedness

material change in our findings. Next, to account for the spillover effect of the partner's acquisition on the firm's industry (e.g., Clougherty & Duso, 2009), we controlled for the average CAR in the firm's four-digit SIC for firms that had no alliances with the partner at the time of acquisition. This control was positively associated with the firm's CAR but our findings remained intact, with a *t*-test showing a higher absolute value of the firm's CAR relative to that of the industry's CAR. Finally, when dropping all controls, we obtained consistent findings.

Sixth, we examined whether our findings are due to relational embeddedness between the partner and its target, but this variable and its interactions with business similarity and complementarity had no effect, and our findings persisted. Seventh, given that some multi-party alliances engage a firm with multiple partners that do not interact among themselves, we dropped one-to-many alliances from our sample (2.68% of the observations), which did not materially affect our findings. We also split our multi-party alliance control into two separate controls for

one-to-many alliances and many-to-many alliances, with the former producing a positive effect and the other yielding no effect on CAR, leaving our reported findings intact.

Eighth, we tested various moderators of the business similarity and complementarity effects: the value chain function of the alliance, relational embeddedness between the partner and its target, cross-border status of the alliance and acquisition, an indicator of whether the firm and the target are from the same country, and the relative bargaining power of the firm vis-à-vis the partner based on their relative profitability and number of alternative alliances (as well as their combination). None of these moderators produced an effect, with our findings remaining intact. Finally, our findings were insensitive to the exclusion of outliers.

4.2 | Accounting for selection, endogeneity, and reverse causality

To account for sample selection due to the partner's decision to acquire (results tables in Supporting Information), we first predicted the probability of an acquisition in a given year. We included all the controls from the second stage except the target's R&D intensity. We used partner performance (ROA) and slack resources (cash divided by assets) in the preceding year as exclusion restriction variables that impact the probability of an acquisition (Table S2) but are not highly correlated with residuals in the second-stage model (Certo et al., 2016). Finally, partner and year fixed effects accounted for unobserved heterogeneity. We used a probit model with standard errors clustered at the partner level. Table S1 details descriptive statistics, with Table S2 reporting the results of our first-stage model. We include the inverse Mills ratio from this model as a control (λ *Partner Acquisition*) in the second-stage models (Table S3),¹⁴ but it had no effect on CAR.

Could the acquisition be a reaction to the alliance rather than affecting its value? Such a scenario is unlikely to bias our findings since: (a) in the software industry, a firm's alliances are typically coordinated by a dedicated alliance function (Findikoglu & Lavie, 2019; Kale et al., 2002), while acquisitions are separately decided by a corporate development or an M&A unit (Trichterborn, Zu Knyphausen-Aufseß, & Schweizer, 2016), so alliances are unlikely to impact decisions relating to acquisitions of third parties; (b) it is unlikely that a partner reacts to a limited-scope alliance with a major long-term commitment to acquire (Laamanen, 2007; Wang & Zajac, 2007) rather than ally; (c) none of the reported motivations to acquire was related to an alliance; and (d) even if an alliance facilitated the acquisition, each partner had 12.689 alliances on average, so there is a low probability that the alliance in question drove that acquisition. Although our auxiliary analyses and insights from prior research suggest that endogeneity and reverse causality are less probable, we consider various scenarios.

First, a partner's acquisition may reveal its commitment to an area of business, which may increase its alliance commitment. However, the partner's acquisition in the firm's business domain may also suggest lack of commitment to its alliance that could intensify the competitive tension with the firm. This scenario is proxied by the percentage change in the partner's revenue in the firm's primary four-digit SIC in the year preceding the acquisition. A second scenario is that an acquisition of a similar business may imply that the firm could not deliver on its promise, in line with our prediction that acquiring a target in the firm's business undermines the alliance's value. To assess this, we searched for information on the firm's underperformance, including lawsuits filed by the partner against the firm, press items in which the partner

¹⁴In auxiliary analysis, we set a first-stage model to predict the partner's acquisition in the firm's primary four-digit SIC. The inverse Mills ratio had no effect in the second-stage model, with our findings remaining intact.

complains about the firm, and premature termination of the alliance, but we found no such evidence. Still, a decline in firm performance may influence the firm's ability to meet commitments, so we measured the inverse of the change in the firm's ROA in the pre-acquisition year.

A third scenario is that the partner's acquisition in a similar business indicates a counter-attack following the firm's preemptive move, in line with Hypothesis 1. We capture this with the percentage change in the firm's revenue in the partner's primary four-digit SIC in the previous year. A fourth scenario is that the competitive tension between the firm and its partner may underpin the acquisition, which in turn exacerbates that tension. We proxy for the competition between the firm and the partner with their product market overlap in the year preceding the acquisition. A final scenario is that the partner was aware of the possible adverse effect of its acquisition, but still decided to undertake it for a strategic purpose. Thus, we coded the purpose of the acquisition: (a) strengthen an existing business (96.13% of the observations), (b) cope with existing competition (29.46%), (c) obtain new resources (67.46%), and (d) enter a new market (4.96%) (e.g., De Pampflis, 2008; Walter & Barney, 1990). We then created a categorical variable for the purpose of the acquisition: exploitation (motivations (a) and (b), coded "0"), exploration (motivations (c) and (d), coded "1"), or their combination ("0.5").

In attempt to account for the first four scenarios, we incorporated each corresponding variable as a predictor in our first-stage model, but neither affected the likelihood of the partner's acquisition (Table S4). Furthermore, none of the inverse Mills ratios affected the firm's CAR (Table S5), and our findings remained mostly intact. Next, we examined whether these scenarios impose a boundary condition for our predicted effects on the firm's CAR. For all scenarios, the moderating effects of embeddedness between the firm and the partner remained mostly intact. Then, for the fifth scenario, we controlled for whether the firm was mentioned in the acquisition announcement and for the motivation for the acquisition (Table S6), and our findings remained intact. We next introduced these as moderators of our similarity and complementarity effects, obtaining consistent findings. In sum, although we could only proxy for these scenarios with archival data, we observed no systematic selection bias and our findings were insensitive to these scenarios. Finally, using propensity-score matching based on assets, R&D intensity, and size of the alliance portfolio, we created a matched sample of publicly traded firms that had no alliances with the acquirers. These firms' CAR and absolute value of CAR were smaller than those of the sampled firms. The corresponding findings for the matched sample reveal no effect on CAR with some inconsistent coefficient signs. Finally, we incorporated the absolute differences between the firm and matched firm's measures of similarity and complementarity with the target as additional controls, and our findings remained intact. Hence, we found no evidence of endogeneity and selection biases.

5 | DISCUSSION

Research on alliances and acquisitions has focused on their unique advantages for corporate development, yet most firms engage concurrently in both alliances and acquisitions. It is thus essential to understand how a firm's acquisitions impact its alliance operations and vice versa. Although prior research has offered extensive insights into the effect of partnering experience on the likelihood and outcomes of acquisitions, little is known about how acquisitions affect alliances. One intriguing question is how an acquisition initiated by a firm's alliance partner impacts the value that the firm can create and capture from this alliance. The performance implications of third-party acquisitions have received almost no attention in prior research.

Our study extends the relational view in alliance research (Dyer & Singh, 1998), and reconciles opposing views on the implications of a partner's acquisitions. Some studies have suggested that a partner's acquisitions can undermine its alliance relationships and lead to termination (Cui et al., 2011; Rogan, 2014; Spedale et al., 2007; Xia, 2011), whereas others have directed attention to the potential gains following a partner's acquisitions (Hernandez & Menon, 2018; Hernandez & Shaver, 2019). Whereas Hernandez and Shaver (2019) reveal the value created by an acquirer that combines its network with that of its target, we consider the implications of such acquisition for a third party. We show that a partner's acquisition either undermines or enhances the value of the firm's alliance with that partner, depending on the extent of similarity and complementarity between the businesses of the firm and the acquisition target. We demonstrate that business similarity restricts value creation and capture in the alliance because of the intensifying competition between the firm and its partner following the acquisition that provides the partner with alternative resources. We infer that the target's business substitutes for the firm's business, while improving the partner's bargaining power, and increasing its private benefits at the firm's expense (Lavie, 2006).

Additionally, we reveal that business complementarity between the firm and the partner's acquisition target extends the set of resource combinations that enhance the value of the alliance to the firm. In that sense, acquisitions rejuvenate the complementary resources of alliance partners, which otherwise diminish in value over time (Dyer et al., 2018). When the businesses of the firm and its partner's target are complementary, the alliance can create new synergies via multilateral combinations of resources furnished by the firm, its partner, and the target. This insight informs research on acquisitions, which so far has highlighted the immediate benefits of combining the resources of the acquirer and its target (Kim & Finkelstein, 2009; King et al., 2008; Makri, Hitt, & Lane, 2010). We advance this research by uncovering the merits and caveats of combining third-party resources.

Moreover, we offer counterintuitive insights into the role of relational embeddedness. Contrary to expectations, relational embeddedness between the firm and its partner increases the loss associated with the similarity between the businesses of the firm and its partner's acquisition target. This is in line with evidence that an embedded relationship between an advertising firm and its client is more likely to dissolve when the competitive overlap with the firm's other clients increases following an acquisition (Rogan, 2014).

The counterintuitive role of embeddedness in reinforcing the caveats of business similarity between a firm and its partner's target can be ascribed to unfulfilled expectations, betrayal of trust, and fear of knowledge spillover. Why would the partner opt for acquiring a target that directly competes with the firm instead of extending their alliance in view of their embedded relationship? The partner's decision to forgo that opportunity inflicts a loss on the firm because the alliance could otherwise be perceived by investors as a stepping-stone toward an acquisition (e.g., Hagedoorn & Sadowski, 1999). Thus, the partner's acquisition of another target, despite their embedded relationship, sends a negative signal to the market. In fact, when a firm and its partner have developed an embedded relationship in their recurrent alliances, such an acquisition follows or results in a breakdown of trust with that partner (Harmon, Kim, & Mayer, 2015), undermining their embedded relationship (Rogan, 2014).

The acquisition of a target that maintains business similarity with the firm also intensifies the competitive tension between the firm and its partner, thus invoking opportunistic and non-cooperative behaviors typical of cooptation (Khanna et al., 1998; Nieto & Santamaría, 2007; Tidström, 2014). When relational embeddedness transpires between the firm and its partner, competitive tension may become detrimental given the sense of betrayal and the perception of

the partner as an emerging rival (Kilduff, 2019). Indeed, relational embeddedness may restrict competitive interaction between the firm and its partner, but once a competitive action is taken by the partner, such as acquiring a target with a business similar to that of the firm, their embeddedness can facilitate a competitive war, “adding gasoline to the fire” (Yu, Guo, Gimeno, & Zhang, in press). Moreover, in an embedded relationship, the firm tends to share tacit knowledge and proprietary assets with its partner, which can endanger its competitive position if these assets find their way to a competitor. In that regard, relational embeddedness can create vulnerability to opportunistic behavior of the acquiring partner (Poppo, Zhou, & Zenger, 2008). As the competitive tension with the partner increases and private benefits outweigh common benefits (Arslan, 2018), relational risk grows. Following a partner’s acquisition of a target that competes with the firm, the partner’s strategic orientation may become unfavorable to the firm and increase the risk of unintended knowledge spillover (Rogan, 2014). Overall, the relational embeddedness with the partner combined with business similarity with its target increases the tension in the alliance, undermines value creation, and restricts value capture by the firm.

Betrayal of trust and knowledge spillover cannot explain why relational embeddedness undermines the value of business complementarity with the target. According to received wisdom in alliance research, relational embeddedness fosters mutual trust and personal attachment among alliance managers, which should enhance the firm’s and its partner’s ability to combine and leverage their complementary resources and to create common benefits (Dyer & Singh, 1998). We find, however, that while a partner’s acquisition of a target with a complementary business facilitates value creation in its alliance with the firm, the resulting common benefits are constrained when the firm and its partner have nurtured an embedded relationship. One explanation for this counterintuitive result is routine rigidity, which prevents the creation of new synergies following the acquisition.

Relational embeddedness evolves in recurrent alliances between the firm and its partner, during which the parties develop relation-specific routines that enable them to efficiently apply co-specialized procedures for knowledge exchange and combination of their complementary resources (Dyer & Singh, 1998; Gulati et al., 2009; Zheng & Yang, 2015; Zollo et al., 2002). Relation-specific routines facilitate joint decision-making and problem-solving (Uzzi, 1996), while mitigating conflict with the partner. However, over time, with their recurrent application, these routines can become rigid and inert (Findikoglu & Lavie, 2019; Nelson & Winter, 1982), which entrenches the parties into patterns of collaboration that limit search for new resource combinations (Gulati & Gargiulo, 1999). Consequently, when new opportunities arise to leverage the complementarity between the firm and the partner’s acquisition target, the parties may be unable to adapt the relation-specific routines that are essential for accessing and combining their complementary resources (Dyer & Singh, 1998). Such post-acquisition modifications are needed because the target introduces resources that are new to the partner and the alliance. Alliances typically lack mechanisms for strategic alignment and restructuring (Poppo et al., 2008). Hence, relational embeddedness introduces routine rigidity that constrains the ability to create value from new resource combinations following the acquisition of a target with a complementary business. This resonates with the notion of the dark side of relational embeddedness (Oliveira & Lumineau, 2019), which has been related to the vulnerability of embedded relationships that may inhibit adaptation when coordination requirements change (Gargiulo & Benassi, 2000). We uncover nuances of this dark side that may manifest by reinforcing competitive tension and restricting synergetic cooperation.

More broadly, these insights inform research on the challenges of managing alliances. The dyadic emphasis of such research has taken attention away from seemingly unrelated partner initiatives, such as the partner’s acquisitions, which have been assumed to be exogenous, if not assumed away. These corporate initiatives are difficult to observe, foresee, and react to, however, our study

demonstrates that they are consequential. This calls for extending the notion of alliance management capability (Kale et al., 2002; Schreiner, Kale, & Corsten, 2009) to encompass the ability to study and react to the partner's corporate initiatives beyond the scope of the alliance. Understanding when and how to apply specific routines and exploring non-routine opportunities for creating synergies are vital capabilities for firms whose partners acquire complementary targets. The ability to accommodate or neutralize emerging competitive threats following partners' acquisitions of targets with similar businesses is essential as well. Our study also advances the learning literature, which has alluded to routines as a double-edged sword (Zollo & Reuer, 2010). Routines facilitate deliberate learning (Zollo & Winter, 2002) but also instigate inertia and core rigidities (Heimeriks, Schijven, & Gates, 2012). Our study hints that relational embeddedness creates rigidities not only when market conditions change, but also following a partner's acquisitions that change its business scope. The previously developed relation-specific routines may be ill suited for supporting value creation in the alliance following the partner's acquisition.

In conclusion, our study demonstrates the implications of a partner's acquisitions for its alliance with the firm, suggesting that the value of the alliance to the firm may change with the business similarity and complementarity of its partner's acquisition target. To assess the potential gains or losses associated with these acquisitions, alliance managers should monitor their partners' acquisitions and study their targets in order to identify competitive threats and opportunities for synergies. Similarly, managers in the partner organization should assess the implications of their acquisitions for their alliance portfolio because some alliances may become redundant or fail following these acquisitions. Thus, although such consideration is absent in theory or in practice to date, a decision to acquire should take into account needed changes to the alliance portfolio, including termination of some alliances and investments in others. Our study also challenges the perception that embedded relationships in which the firm has invested are immune following the partners' acquisitions. In fact, the firm's closest relations are at a greater risk, regardless of whether the target competes with or complements the firm. Hence, managers should either leverage their firm's embedded relationship to anticipate and convince the partner to forgo adversarial acquisitions, or terminate their alliance before the hazards materialize. If the acquisition introduces potential synergies, alliance managers should maintain sufficient flexibility to modify relation-specific routines, which otherwise make it difficult to combine the target's resources in the alliance.

Despite its contributions, our study is subject to limitations. One limitation concerns our reliance on CAR to estimate the expected change in value to the firm following the acquisition. The actual value captured by the firm may change as a result of the firm's and its partner's post-acquisition behavior, which we cannot observe, and investors cannot foresee. The parties' behavior, power dynamics, and changes to structure and routines merit further attention (Reuer et al., 2002). Also of interest are the implications of changes in relation-specific routines following acquisitions—differences in the parties' behaviors, alliance management practices, and processes. Moreover, limiting our sample to public entities excludes acquisitions of privately held targets, which are typically small and hence less impactful. The firm's investors may lack information about such a target's business and may not know about the due diligence between the partner and the prospective target, but to the extent that information becomes available, we expect consistent findings. Additionally, we assumed an alignment between the businesses of firms and their resource configurations. Future research may directly capture resource similarity rather than business similarity, although the latter may have more immediate implications (Chen, 1996) and is more relevant in the software industry.

It is also possible that we have not been able to effectively capture the underlying mechanisms with archival data. How competitive tension or synergies materialize can be studied

using surveys which can shed more light on relation-specific routines. Field research may validate our proposed mechanisms, e.g., reduced commitment, change in bargaining power and competitive tension for business similarity, or breakdown of trust, knowledge spillover, and routine rigidity, which explain the counterproductive effects of relational embeddedness. Furthermore, while we identified some boundary conditions, future research may examine when firms gain access to the complementary resources of their partners' acquisition targets. A worthy extension may consider the implications of other corporate initiatives, such as the partner's alliance formation and corporate venture capital investments, for its existing alliance portfolio. Furthermore, despite our preliminary efforts to handle selection, endogeneity, and reverse causality issues, we cannot completely alleviate such concerns using our archival data. Finally, future research may test the generalizability of our findings to other firms, industries, and time periods. For instance, in the software industry, firms possess superior alliance management capabilities, maintain extensive alliance portfolios, and tend to engage in non-equity relations (Lavie, 2007) that are rather flexible. This suggests a conservative research design with potentially stronger effects in other industries. In sum, our study makes important strides toward understanding the interplay of alliances and acquisitions and the implications of partners' initiatives beyond the immediate scope of their alliances.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from Compustat, CRSP, SDC Platinum, Edgar 10-K SEC forms, Lexis Nexis, Factiva, and Forbs databases. Restrictions apply to the availability of these data, which were used under license for this study. Data are available from the authors subject to the permissions of these third parties.

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