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A plural alliance structure involving multiple downstream partners has become increasingly popular, yet investigations of marketing alliances continue to address mainly dyadic structures. The authors present learning and dependence balancing as key mechanisms to understand the relative performance differences between plural and dyadic structures, as well as the determinants of effective collaboration in a plural structure. Two complementary studies test the performance of plural and dyadic structures in a wide range of high-tech industries. The analysis of both plural and dyadic structure alliances in an event study shows that plural structures outperform dyadic structures for the upstream firm when marketing alliances extend to product-related tasks, the upstream firm has more alliance experience, or the industry is growing fast; however, dyadic structures perform better when the upstream market is more competitive. A second study, focusing only on plural structure alliances, shows that horizontal relationship factors (i.e., market overlap and prior relationship between downstream partners) interact with the upstream firm's greater alliance experience and reputation to lead to better returns for the upstream firm.

Keywords: marketing alliance, plural structure, dyadic structure, interfirm relationships, dependence balancing

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Understanding the Effects of Plural Marketing Structures on Alliance Performance

Alliance partners often influence a firm's marketing strategy by providing access to new markets, products, or knowledge (Jap 1999; Swaminathan and Moorman 2009). Although dyadic relationships are the most common alliance structure, many firms develop complex interfirm relationships, or plural structures, to engage multiple partners simultaneously in an alliance (Gong et al. 2007). A plural structure involves a joint team or entity composed of individuals and resource inputs from all parties (e.g., an upstream firm and its multiple downstream partners) to fulfill

their commonly agreed-upon goals. The formation of plural structures is driven by the premise that they can bring together the diverse, complementary resources needed to develop and promote new market offerings more effectively than dyadic structures can (Heidl, Steensma, and Phelps 2014). For example, in 2004, Microsoft entered into an alliance with two downstream computer manufacturers, Lenovo and Acer, to develop and promote a simplified version of Windows for the Asian market. They created a joint team of business developers and engineers from all three firms to leverage both Lenovo's and Acer's strong market presence in and deep understanding of consumers in Asia. According to the SDC Strategic Alliance and Joint Venture database, approximately 17% of marketing alliances involved two or more partners in 2000, but this number nearly doubled to 32% by 2010. However, research-based guidance on when complex multipartner structures enhance performance and how to manage them is absent. Therefore, this study aims to shed light on the relative effect of plural versus dyadic alliance structures on an upstream firm's returns and the factors that influence plural structure effectiveness.

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We distinguish between plural and dyadic structures on the basis of the number of downstream partners that work with the upstream firm in an alliance. In contrast with a dyadic structure, which involves only vertical relationships, a plural structure contains both vertical relationships between the upstream firm and its downstream partners and horizontal relationships among the downstream partners. Prior research has examined vertical and horizontal relationships independently (Rindfleisch and Moorman 2001); we investigate their simultaneous and synergistic effects on the upstream firm's abnormal returns. We offer learning and dependence balancing as key mechanisms that determine alliance performance. On the one hand, alliances with other firms provide an important avenue for external learning. Organizational learning research emphasizes that external learning occurs through access to valuable resources and effective knowledge transfers between partners (Zander and Kogut 1995). On the other hand, resource dependence theory suggests that a firm becomes more vulnerable to the risk of holdup by its partner when it grows increasingly dependent on the resources controlled by that partner (Bae and Gargiulo 2004; Pfeffer and Salancik 2003). We examine a plural structure alliance from these two aspects.

We test our conceptual model using two complementary event studies and an experiment. We begin by analyzing both plural and dyadic structure alliances to test the popular belief that plural structures in general outperform dyadic structures (Lavie, Lechner, and Singh 2007) and to identify factors that determine when plural structures exceed dyadic structures for the upstream firm's abnormal returns from an alliance (Study 1). Next, we narrow our focus to plural structure alliances only and examine how upstream firm–level factors may leverage the horizontal relationship factors between downstream partners (Study 2). Our empirical data come from multiple sources, including the SDC Platinum, Compustat, and CRSP databases; we use an event study methodology to capture the upstream firm's abnormal stock returns after the alliance announcement (Kale, Dyer, and Singh 2002). Finally, using an experimental approach, we provide further support for the hypothesized theoretical mechanisms.

By expanding the focus from a single to multiple downstream partners, this research contributes to our understanding of marketing alliances in three key ways. First, we reveal the relative performance differences between plural and dyadic structures. The findings from Study 1 suggest that although plural structures outperform dyadic structures in general, their relative performance varies depending on alliance-, upstream firm–, and industry-level factors. From the upstream firm's perspective, plural structures outperform dyadic structures to a greater degree for product/marketing-type alliances, at higher levels of upstream firm experience, and when industry growth is higher. Dyadic structures perform better with greater industry competitiveness.

Second, whereas network research has emphasized the structural aspect of a firm's alliance network—such as centrality, density, or structural holes—to examine interactions among multiple partners (Ahuja 2000; Owen-Smith and Powell 2004; Swaminathan and Moorman 2009), this research sheds light on the unique interactions among multiple partners in a plural structure (i.e., interactions across vertical and horizontal relationship factors). The results from

our second study suggest that the horizontal relationship factors between downstream partners, such as market overlap and prior relationships, interact with the upstream firm's experience and reputation to affect the returns from an alliance. The presence of market overlap and an existing relationship between downstream partners leads to greater returns if the upstream firm has more experience or a better reputation. For example, in 2005, Cisco leveraged its extensive alliance experience and reputation in the industry to generate high returns from its plural structure alliance with two downstream manufacturers (Eircom and Net-Centrex), which had high market overlap with each other (PR Newswire 2005).

Third, all three studies support our overall theoretical framework, in which we identify learning and dependence balancing as two mechanisms critical for understanding plural structure alliance performance. The successful management of plural marketing alliances requires a clear understanding of the trade-offs in these underlying mechanisms. Our experimental results confirm the role of the two underlying mechanisms, which increases our confidence in our theoretical explanation of the results from the two event studies.
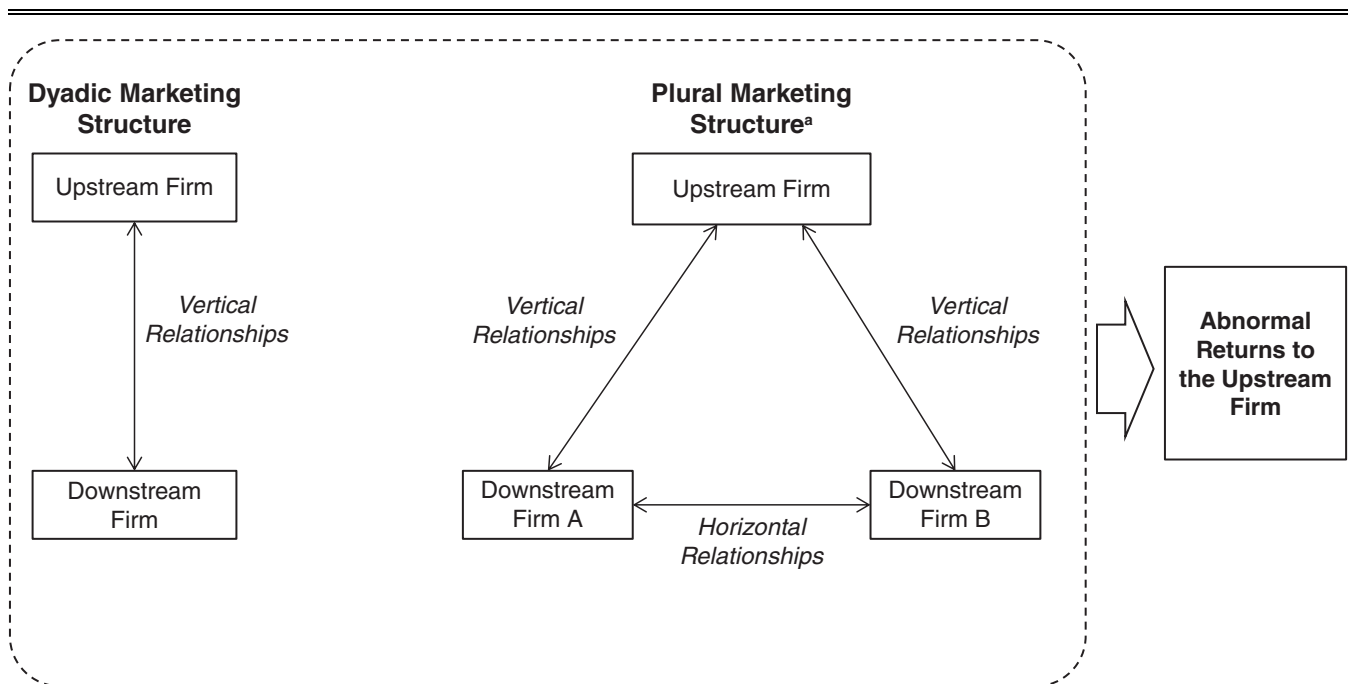
PLURAL MARKETING STRUCTURES

Consistent with Swaminathan and Moorman (2009), we define a vertical marketing alliance as a formalized, collaborative arrangement between upstream and downstream partners, designed to achieve marketing-related objectives, such as access to new markets, products, and market knowledge. We focus on marketing alliances with downstream manufacturers. As we illustrate in Figure 1, compared with a dyadic structure (single upstream firm and downstream partner), a plural structure involves a single upstream firm working with multiple downstream partners,[1] which also can engage in horizontal relationships among themselves, together with the more typical vertical relationship between upstream and downstream partners. The summary of previous studies in Table 1 highlights that vertical alliances have been examined extensively, in the form of dyadic relationships with a single partner, and these studies have indicated a critical role of downstream or upstream partners in creating value (Fang, Palmatier, and Evans 2008; Jap 1999). Other research has emphasized the implications of multiple partners in an alliance (e.g., Gong et al. 2007; Lavie, Lechner, and Singh 2007; Wuyts et al. 2004). However, this research stream has yet to examine how interactions with multiple, interrelated downstream partners affect the upstream firm's returns and how they differ from those with single downstream partners.

Interactions in a plural structure differ from those that occur across multiple dyadic alliances or in a network of alliances, because vertical and horizontal relationships are interconnected in a single alliance. Such interconnected relationships within an alliance make the alliance more complex and lead to unique challenges, such as the choice of plural versus dyadic structures or configurations

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[1]Plural structures may include more than two downstream partners, though as Wuyts et al. (2004, p. 479) note, "structural issues can be addressed by shifting from a dyadic to triadic perspective, and they are not fundamentally altered by further expansion to four or more actors." We therefore focus on a single upstream firm working with two downstream partners.

Figure 1
UNDERSTANDING THE EFFECTS OF PLURAL MARKETING STRUCTURES ON ALLIANCE PERFORMANCE

[a]Study 1 investigates when plural vertical marketing structures are superior to dyadic vertical marketing structures at improving marketing alliance performance, while Study 2 evaluates the factors determining the effectiveness of plural marketing structures once chosen.

of vertical and horizontal relationship components in a single alliance setting. We attempt to reveal when the upstream firm should adopt plural versus dyadic structures for working with downstream partners and how to manage a plural structure alliance if the firm chooses to adopt it.

Drawing on organizational learning and dependence theories (Pfeffer and Salancik 2003; Zander and Kogut 1995), we propose that learning and dependence balancing are two mechanisms that affect the upstream firm's returns from a vertical marketing alliance. Specifically, firms often learn from downstream partners. By working with downstream alliance partners, the upstream firm can better adjust its product development and marketing activities in accordance with the specific needs of downstream partners (Fang, Palmatier, and Evans 2008).

Table 1
SELECTED LITERATURE ON SINGLE-/MULTIPLE-PARTNER ALLIANCES

References	Context	Single/Multiple Partners	Vertical/Horizontal Relationship	Findings
Houston and Johnson (2000)	Alliance between buyer and supplier	Single partner	Vertical	Buyers and suppliers are more likely to form a joint venture when they face more transaction costs.
Fang, Palmatier, and Evans (2008)	Customer codevelopment	Single partner	Vertical	Customer participation affects new product value creation by improving product development process specific investments in the product development effort.
Jap (1999)	Relationship between manufacturer and supplier	Single partner	Vertical	Coordination efforts and partner-specific investments enhance profit performance and competitive advantages over time.
Wuyts et al. (2004)	Supplier–vendor–buyer relationships	Multiple partners	Vertical	The structure of overall ties among suppliers, vendors, and buyers affects buyers' preferences for vendors.
Lavie, Lechner, and Singh (2007)	Multipartner alliance: "Wi-Fi alliance"	Multiple partners	No distinction	In the Wi-Fi alliance, firms benefit from greater involvement in the focal alliance as well as from the participation in competing alliance. Early or late participants benefit more than intermediate participants.
Gong et al. (2007)	Multipartner international joint ventures	Single and multiple partners	No distinction	The number of partners is inversely related to joint venture performance, and the relationship is mediated by contract completeness and partner cooperation.

The effective coordination of partners' resources and capabilities along the value chain then becomes a source of learning that leads to a firm's competitive advantage (Jap 1999). Balancing dependence in the relationship with partners also supports effective collaboration (Adegbesan and Higgins 2010; Bae and Gargiulo 2004). However, the upstream firm's partner-specific investments in a vertical marketing alliance make it more dependent on that downstream partner. It faces greater risks of holdup and opportunism because the downstream partner can take advantage of the upstream firm's dependence (Hennart and Zeng 2005). Such dependence may also result from investments in product designs or product standards that meet the needs of a unique downstream partner (Houston and Johnson 2000).

We conduct three complementary studies, focusing on the unique aspects of plural versus dyadic structures from learning and dependence-balancing perspectives. In Study 1, we aim to determine the relative benefits of plural and dyadic structures for the upstream firm. Specifically, we test whether a plural structure, in general, outperforms a dyadic structure. By elaborating on the unique benefits and challenges of plural versus dyadic structures, we identify the factors that determine when plural structures exceed dyadic structures. First, alliance literature holds that the scope of functional activities in an alliance affects learning and determines the risk of dependence and opportunism (Kalaignanam, Shankar, and Varadarajan 2007; Oxley and Sampson 2004). We thus identify two main types of alliances: a marketing-only alliance (collaborative arrangement includes only marketing objectives) and a product/ marketing alliance (collaborative arrangement includes both product development and marketing objectives) to capture the scope of the alliance. Second, a firm's outcomes from an alliance vary with its internal capability to manage that alliance (Kale, Dyer, and Singh 2002; Swaminathan and Moorman 2009), so we investigate two upstream firm–level factors: the upstream firm's experience and reputation. Third, the industry environment creates boundary conditions that affect the value of a firm's internal and external resources (Amit and Schoemaker 1993). Accordingly, we consider two industry-level factors: industry growth and competitiveness.

In Study 2, we focus on the plural structure to explore its unique aspect—namely, the presence of both an upstream firm's vertical relationships with its downstream partners and the horizontal relationships among downstream partners in a single alliance. We investigate how the horizontal relationship factors might be leveraged by the upstream firm–level factors we investigated in Study 1. Specifically, horizontal relationships in a plural structure entail both cooperative and competitive pressures that may affect learning and dependence balancing (Luo, Rindfleisch, and Tse 2007). Prior relationships between downstream partners can help build such pressure for cooperation (Gulati 1995); in contrast, downstream partners operating in an overlapping market face competitive pressure to appropriate shared resources (Luo, Rindfleisch, and Tse 2007; Rindfleisch and Moorman 2001). We consider both these horizontal relationship factors—market overlap and prior relationship between downstream partners—and investigate how they interact with upstream firm–level factors to determine the effectiveness of plural structures. Finally, in Study 3, we conduct a scenario-based experiment to confirm our key premise in Study 2—that is, the roles of prior relationships and market overlap among downstream partners in promoting or hindering learning and dependence balancing in a plural structure.

STUDY 1: PLURAL VERSUS DYADIC STRUCTURES

Relative Benefits of Plural Versus Dyadic Structures

A dyadic structure generates positive returns (Swaminathan and Moorman 2009), but a plural structure has greater potential from both learning and dependence-balancing perspectives. For learning, a plural structure provides more learning opportunities for the upstream firm by pooling resources and capabilities across multiple downstream partners (Lavie, Lechner, and Singh 2007). Interactions with multiple downstream partners, rather than a single downstream partner, also enable the upstream firm to develop and introduce new market offerings that serve a broader customer base. However, such learning opportunities do not necessarily lead to more knowledge transfer among partners. In particular, a plural structure can hinder the upstream firm's learning efficiency as a result of the complexity of managing multiple downstream partners in an alliance (Gong et al. 2007). In addition to the risks of unintended knowledge leakage by the upstream firm to the parties outside the alliance, the downstream partners in a plural structure alliance must worry about the unintended leakage of their internal market knowledge to the other, potentially competing, downstream partners within the alliance (Luo, Rindfleisch, and Tse 2007). The upstream firm even might act as a common third party that mediates unintended knowledge leakage between downstream partners. These concerns can make downstream partners less cooperative or less likely to share information, in which case the upstream firm's learning would be less efficient in a plural structure. In contrast, a dyadic structure would not cause these concerns, because it involves only one downstream partner within the alliance. If downstream partners are less cooperative in a plural structure than in a dyadic structure, the process of learning becomes less efficient. Accordingly, a plural structure may have opposing effects on learning: it provides more learning opportunities to upstream partners through access to multiple downstream alliance partners, but it suppresses learning by reducing downstream partners' willingness to share knowledge with an upstream partner because of concerns of leakage to potentially competing downstream partners.

For dependence balancing, the plural structure, compared with the dyadic structure, can reduce the upstream firm's dependence on any single downstream partner. The replaceability of a partner's resources reduces a firm's dependence on that partner (Heide and John 1988). By involving multiple downstream partners rather than a single downstream partner in an alliance, the upstream firm has an opportunity to replace one downstream partner with the other one within the alliance to the extent that their resources and capabilities overlap; in contrast, the dyadic structure does not provide such an opportunity to replace its downstream partner within the alliance. As such, the upstream firm in the plural versus dyadic structure can balance dependence through "structural changes" (Emerson 1962, p. 34) in the relationship. All else being equal, an upstream firm becomes less dependent on any specific downstream partner in an alliance with more downstream partners (i.e., a plural structure). By reducing its dependence through a plural structure, the upstream firm can better avoid the risk of holdup by any of its downstream partners (Hennart and Zeng 2005). As

such, a plural structure enables the upstream firm to balance its dependence across multiple, potentially overlapping, downstream partners. Thus, as a baseline hypothesis, we argue that plural structures outperform dyadic structures for the upstream firm as a result of enhanced dependence balancing, though the relative benefits from learning is indeterminate.

> H_1: Upstream firms achieve greater abnormal returns from plural (vs. dyadic) structures.

Moderating the Performance Trade-Offs of Plural Versus Dyadic Structures

Marketing alliance type. Marketing alliances are often broadened to include product development in addition to marketing objectives (Swaminathan and Moorman 2009). From a learning perspective, when the alliance is defined broadly, with both product development and marketing objectives, upstream partners have more areas in which they can gain performance-enhancing knowledge from downstream firms, which leverages the learning benefits obtained from their plural structure alliance. However, more diverse functional activities can further increase the downstream partners' concerns about unintended knowledge leakage in a plural structure alliance, making downstream partners less cooperative when pooling resources (Kalaignanam, Shankar, and Varadarajan 2007). Thus, the relative effectiveness of plural versus dyadic structures for learning is mixed in product/marketing alliances.

For dependence balancing, the upstream firm should benefit more from plural than dyadic structures if the alliance includes both product development and marketing objectives. The commitment and complexity caused by a broad- versus a narrow-scope alliance make it difficult for a firm to switch its partner with new, alternative partners outside the alliance. Thus, all else being equal, the upstream firm engaging in a broader-scope alliance is more likely to depend on its partners to achieve its goals across different functional tasks, increasing the risks of performance-damaging holdup by its partners (Oxley and Sampson 2004).

Thus, the upstream firm's enhanced dependence balancing through plural structures offers more benefit to the upstream firm when an alliance involves more diverse functional activities. Although the plural structure's benefits for learning are mixed, it offers greater benefits for the upstream firm's dependence balancing in a product/marketing alliance than in a marketing-only alliance. Overall, a plural structure should have a greater positive effect on upstream firm performance than a dyadic structure when the alliance has both product development and marketing objectives.

> H_2: The upstream firm's abnormal returns from marketing alliances using plural (vs. dyadic) structures are greater for product/ marketing alliances than for marketing-only alliances.

Upstream firm experience. Alliance experience accumulated over time becomes a foundation for creating and extracting value from new alliances (Khanna, Gulati, and Nohria 1998). In addition, experience provides more awareness of the potential risks associated with working with multiple downstream partners, the tacit knowledge needed to prevent these risks from materializing (Anand and Khanna 2000), and the ability to manage complex relationships more effectively (Hoang and Rothaermel 2005). These experience-generated abilities are particularly critical for more complex plural structures because they enhance the upstream firm's ability to extract knowledge from multiple downstream partners and manage downstream partners' knowledge leakage concerns. An upstream firm with more experience can better manage these complex interactions with multiple downstream partners and thus facilitate more efficient learning, which is not as important in simpler dyadic alliances. As such, the upstream firm's alliance experience likely pays off more with performance-enhancing learning benefits in plural than in dyadic alliances.

> H_3: The upstream firm's abnormal returns from marketing alliances using plural (vs. dyadic) structures are greater when the upstream firm has more experience.

Upstream firm reputation. Firm reputation refers to "a perceptual representation of a company's past actions and future prospects that describe the firm's overall appeal to all its key constituents when compared to other leading rivals" (Fombrun 1996, p.72). It reflects the quality or capability of a firm in the industry, and it enhances a firm's attractiveness as a partner (Podolny 2001). All else being equal, downstream partners should be more willing to cooperate and share information with a reputable upstream firm to help build and maintain a relationship with this more valuable partner (Nahapiet and Ghoshal 1998). The downstream partners' enhanced willingness to cooperate and share information with high-reputation upstream firms is especially critical in plural (vs. dyadic) alliances to help overcome the downstream partners' concerns of unintended knowledge leakage in the plural structure. Thus, the upstream firm's reputation likely offers greater value for its learning from alliances with more complex structures involving multiple downstream partners.

> H_4: The upstream firm's abnormal returns from marketing alliances using plural (vs. dyadic) structures are greater for upstream firms with strong (vs. weak) reputations.

Industry growth. In fast-growing industries, firms have more opportunities to extract benefits from enhanced learning because they can use their superior knowledge to attract customers and offer well-targeted products to their growing customer base (Murtha, Lenway, and Hart 2001). Firms also face time pressures to keep abreast of the faster pace of product and market development, which provide more opportunities to arbitrage additional knowledge into superior performance (Stanko and Olleros 2013). As such, the enhanced learning opportunity provided by access to multiple downstream partners in plural alliances offers more benefits in a high-growth industry. Downstream partners also should be more motivated to share information to jointly exploit the opportunities associated with industry growth (Jap 1999). From a dependence-balancing perspective, the upstream firm likely has a greater need to understand changes in a rapidly growing market, which makes it more dependent on downstream partners that have more direct access to end customers (Stanko and Olleros 2013). Thus, the enhanced dependence balancing offered in a plural structure should be more valuable for upstream firms operating in more rapidly growing industries.

> H_5: The upstream firm's abnormal returns from marketing alliances using plural (vs. dyadic) structures are greater as industry growth increases.

Industry competitiveness. Industry competitiveness reflects the degree to which the upstream firm faces competition in its industry (Jaworski and Kohli 1993). When the industry is more competitive, the upstream firm has a greater need for superior information from downstream partners to respond to competitive changes. Thus, the upstream firm can benefit more from a plural than a dyadic structure because it can access more extensive and diverse information from multiple downstream partners. From a dependence-balancing perspective, the upstream firm also can benefit more from a plural structure. An upstream firm loses bargaining power and faces higher risks of holdup when downstream partners have more competitive alternatives beyond the alliance (Adegbesan and Higgins 2010). Thus, the enhanced dependence balancing offered in a plural structure is more valuable for upstream firms operating in more competitive industries.

H$_6$: The upstream firm's abnormal returns from marketing alliances using plural (vs. dyadic) structures are greater as industry competitiveness increases.

Research Approach

We adopted an event study approach, as used extensively by business scholars to examine the valuation of strategic investment decisions (Anand and Khanna 2000; Kalaignanam, Shankar, and Varadarajan 2007; Kale, Dyer, and Singh 2002). To derive the performance implications of marketing alliances, it is necessary to measure effects that accrue over time, both directly and indirectly. Inputs from marketing alliances, such as access to new markets or enhanced customer knowledge, can affect firm value indirectly by enhancing new product development or brand value as well as by having a direct impact on sales (Swaminathan and Moorman 2009). Stock market returns offer a forward-looking metric that reflects investors' expectations of the overall effects of an event on firm value (Kalaignanam, Shankar, and Varadarajan 2007). Specifically, alliances result from important decisions that provoke great attention from investment communities. For example, alliance announcements offer market signals that prompt coverage from security analysts who estimate firm values (Jensen 2004), and they have significant influences on stock movements (Kalaignanam, Shankar, and Varadarajan 2007; Swaminathan and Moorman 2009). Thus, we can infer the market value produced by relationships from a determination of the abnormal stock price effects associated with alliance announcements. Kale, Dyer, and Singh (2002) support the validity of an event study approach by showing that abnormal stock returns to alliance announcements correlate highly with the firm performance reported by managers.

Data Sample

We empirically tested our hypotheses in a range of high-tech manufacturing industries during the time frame of 1998–2010. We followed a multistage approach, in line with Swaminathan and Moorman (2009). First, we started with 450 randomly selected publicly traded firms from several high-tech industries: computer and related products (Standard Industrial Classification [SIC] codes 3571–3576, North American Industry Classification System [NAICS] codes 3341–3342), electronic components and semiconductor (SIC codes 3670–3677, NAICS code 3344), software development (SIC codes 7371–7379, NAICS code 5415), and

pharmaceutical and biotech (SIC codes 2833–2836, NAICS code 3254). In these high-tech industries, alliances play important roles in implementing marketing activities; firms in these industries rely on collaborations with downstream manufacturers to commercialize their products or technologies in appropriate markets (Fang, Lee, and Yang 2015). Thus, these high-tech industries provide an appropriate context in which to examine alliance activities with downstream partners. From each industry group, we drew an approximately equal number of firms (i.e., 150) and obtained firm data from Compustat. We removed firms with too many missing values (i.e., more than half) on measures that would provide the firm-level variables.

Second, we identified all the alliances of the remaining firms established during our study period from the SDC Strategic Alliance database. This database reveals the main characteristics of alliances, such as the firms involved, the date of their announcement, major activities by the alliance (e.g., marketing, manufacturing, research and development [R&D]), its forms (equity or nonequity), and descriptions of its objectives. Previous studies have used this comprehensive database to examine alliance networks (Swaminathan and Moorman 2009), strategic activities (Lin, Yang, and Demirkan 2007), and relationship resources (Rothaermel, Hitt, and Jobe 2006). We carefully matched the firms from the SDC database with those from Compustat and removed any that could not be matched. In addition, because we were interested in marketing alliances, we included only alliances whose activities included sales, promotion, branding, or other marketing-related activities to access new markets, products, or knowledge or skills. We removed any alliances focused on only R&D or manufacturing activities. To identify plural structure marketing alliances, we narrowed the list by requiring the involvement of three parties in an alliance, which produced 671 alliances by 371 firms.

Third, we examined the alliance descriptions and selected the 479 alliances involving one upstream and two downstream firms. In addition, we focused on downstream manufacturers, removing alliances in which either or both of the downstream partners were distributors or retailers. Agreements with distributors/retailers often entail simple buyer–seller transactions, rather than pooled resources to fulfill common goals.[2] This step narrowed our list further to 386 alliances across 238 upstream firms.

Fourth, because event studies require accurate information about announcement dates, we verified the data by checking alternative sources (e.g., Factiva, LexisNexis, company websites). If we could not locate information or found inconsistent announcement dates, we dropped those alliances from the analysis. These procedures, together with the exclusion of observations with missing values, produced 335 announcements by 213 upstream firms between 1998 and 2010. Furthermore, we carefully checked the database and the alternative sources to ensure that these announcements involved all three parties in the alliance, rather than two separate dyadic alliances announced at the same time.

Fifth, after we collected the data for the plural marketing alliances from the SDC Strategic Alliance database, we gathered all dyadic marketing alliances with downstream manufacturers from these 213 firms in the same time window (1998–2010) with nonmissing information. The dyadic marketing

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[2]We thank an anonymous reviewer for this suggestion.

alliances involved one upstream firm and one downstream partner; we excluded dyadic marketing alliances with horizontal or upstream partners to ensure the comparability of the plural and dyadic marketing alliances. This effort enabled us to identify 620 dyadic marketing alliances.

Sixth, we removed 27 cases (11 plural and 16 dyadic) with overlapping announcement windows or other announcements by competitors (e.g., competitors making marketing alliance announcements) or by the firm itself (e.g., mergers and acquisitions, new product announcements). We did this to avoid overestimated or compounded returns across multiple announcements (Kalaignanam, Shankar, and Varadarajan 2007).

These data collection efforts produced 928 marketing alliances (324 plural and 604 dyadic) from 213 firms during 1998–2010. Among them, 26% feature upstream firms in electronic components and semiconductor, 34% in software development, and 40% in pharmaceutical and biotech industries.

Measurement

Abnormal returns to the upstream firm. We used the cumulative abnormal stock returns for upstream firms following their alliance announcements as measures of their benefits. For each upstream firm, we used daily data about the stock market returns from the CRSP database during a 240-day period ending 10 days before the event day (Anand and Khanna 2000). We adopted a four-factor model to calculate daily abnormal returns (e.g., Srinivasan and Hanssens 2009) (for more details, see Web Appendix A).

To choose appropriate event windows, we followed Swaminathan and Moorman (2009) and calculated the cumulative average abnormal returns for various windows (+10 days to –10 days), then tested their significance with t-statistics (Brown and Warner 1985). We selected the event window with the most significant t-statistics; for both upstream and downstream partners, this window spanned from day –2 to day +1. (In Web Appendix A, Table A1, we provide the average abnormal returns with alternative windows.)

We also examined abnormal returns for both dyadic and plural structure alliances. For dyadic marketing alliances, the average abnormal return was 1.71%, and the average abnormal return for plural marketing alliances was 2.29% (both significant at .01 levels). These results provide initial, model-free evidence that both dyadic and plural marketing alliances generate positive abnormal returns on average.

Marketing alliance structure and type. We measured the plural/dyadic marketing structure as a dummy variable equal to 1 if the alliance is plural and 0 if it is dyadic. Consistent with Swaminathan and Moorman (2009), we coded marketing alliance type as a dummy variable equal to 1 if it involves both marketing- and product-related activities and 0 if it involves only marketing-related activities. The SDC database lists the specific activities of each alliance, including marketing tasks such as sales, cobranding, promotion, distribution, or advertising and product-related efforts such as joint research or collaborations to develop new technologies or products.

Upstream firm experience and reputation. We measured the number of alliances the upstream firm had established in the five-year period prior to the alliance announcement using data from the SDC database. We measured firm reputation with an approach consistent with Houston and Johnson (2000) and Swaminathan and Moorman (2009)—namely, using *Fortune*'s reputation survey. If the upstream firm was listed among the most admired firms in any of the past five years, we gave it a value of 1; if not, we assigned it a value of 0.

Industry growth and competitiveness. For industry growth, consistent with Fang, Palmatier, and Steenkamp (2008), we first regressed sales revenues in the upstream firm's industry (four-digit SIC code) across the prior five years (i.e., time is the independent variable). Next, we divided the slope coefficient obtained from this regression by the mean value of industry sales for those years (to adjust for absolute industry size) to arrive at the growth score for each industry. For industry competitiveness, consistent with Fang, Palmatier, and Grewal (2011), we used a Herfindahl index and squared each firm's market share, then took the sum over all firms in the industry. Because we were interested in industry competitiveness, not concentration, we subtracted the sum from 1.

Control variables. We controlled for several variables that might affect marketing alliance valuation at the alliance, firm, and industry levels. At the alliance level, we controlled for alliance equity arrangement and used a dummy variable equal to 1 if the alliance involved an equity investment by the upstream firm, and 0 otherwise. In addition, we controlled for downstream partner power, but in our sample, most downstream partners were private firms that were not required to make firm size or other financial information available. We instead used the public versus private status of the downstream firm as a proxy, because public firms generally have more resources available to influence their partners (Baum, Calabrese, and Silverman 2000; Kalaignanam, Shankar, and Varadarajan 2007). We coded this variable as 1 if any downstream partner in the alliance was public, and 0 otherwise. At the firm level, we controlled for firm size, measured by the log transformation of the number of employees. We also controlled for marketing and R&D intensity using data from Compustat for the year of the announcement. Specifically, for marketing intensity, we divided the firm's sales and general administrative expenditures by the firm's total sales; for R&D intensity, we divided R&D expenditures by the firm's total sales.

Finally, we controlled for industry dynamism. Following Fang, Palmatier, and Steenkamp (2008), we calculated the standard deviation of sales in the upstream firm's industry (four-digit SIC code) for the five years prior to the announcement, then divided that number by the mean value of industry sales for those years. We obtained these data from Compustat. We also included year dummies to control for unobserved year-specific factors that may affect firm abnormal stock returns. Table 2 summarizes the measures, sources, and descriptive statistics of the variables in our model.

Model Analysis

Self-selection correction. Our unit of analysis was the alliance announcement; the abnormal stock returns associated with each announcement provided the dependent variable. To estimate our conceptual model, we cannot use ordinary least squares because the upstream firm's decision to engage in a dyadic or plural structure marketing alliance is a self-selected variable, so there might be systematic differences between firms that engage in plural alliances versus firms that do not. To estimate such a self-selection model, a typical approach is a two-stage Heckman (1979) model (Wiles, Morgan, and Rego 2012). However, this approach is not appropriate here, because the Heckman model applies only to a bivariate distribution involving two "states," whereas in our study context, a firm

Table 2

MEASUREMENT, DATA SOURCES, AND DESCRIPTIVE STATISTICS

Variables	Measures	Data Sources	M	SD
Alliance performance	Cumulative abnormal stock returns of upstream firm implementing a vertical marketing alliance	CRSP database	.019	.049
Plural marketing structures (vs. dyadic structures)	Coded as 1 if marketing alliance is formed with two downstream partners, 0 if it is formed with one downstream partner	SDC strategic alliance database	.349	.477
Marketing alliance type	Coded as 1 if the marketing alliance includes product-related activities in addition to marketing-related activities, 0 if it includes marketing-related activities only	SDC strategic alliance database	.695	.421
Upstream firm experience	The number of alliances that the focal firm has established in the past five years	SDC strategic alliance database	9.349	2.612
Upstream firm reputation	Coded as 1 if the focal firm was listed in *Fortune*'s most admired firms in any of the past five years, 0 otherwise	*Fortune*'s firm reputation survey	.211	.319
Industry growth	Growth rate of sales across the industry (four-digit SIC code) during the past five years, divided by the mean value of industry sales for those years	Compustat	.114	.126
Industry competitiveness	1 – Herfindahl index of firm sales across the industry	Compustat	.298	.174
Industry dynamism	Standard deviation of sales across the industry (four-digit standard industrial classification) during the past five years, divided by the mean value of industry sales for those years	Compustat	.148	.081
Market overlap between downstream partners (for plural structures only)	Coded as 3 if the two downstream partners overlap in both product/service and market, 2 if they overlap in either one, and 1 if they overlap in neither	Various sources such as firm annual report, Hoover's database, and company websites	2.279	.728
Prior relationship between downstream partners (for plural structures only)	Coded as 1 if there is a prior relationship between the two downstream partners in the past five years, 0 otherwise	SDC strategic alliance database	.109	.127
Firm size	Log-transformation of the number of employees	Compustat	3.998	1.365
Alliance equity arrangement	Coded as 1 if the alliance involves an equity investment, 0 otherwise	SDC strategic alliance database	.523	.322
R&D intensity	R&D expenditure, divided by total sales	Compustat	.158	.147
Marketing intensity	Selling, general and administrative expenditures, divided by total sales	Compustat	.347	.386
Downstream partner power	Coded as 1 if any one any downstream partner is public, and 0 otherwise.	Compustat	.229	.304

might self-select into three states[3]: it can choose not to participate in any type of alliance, or if it participates, it can choose a dyadic or plural alliance. Therefore, we used a multinomial logit model for self-selection (Bourguignon, Fournier, and Gurgand 2007; Hausman and McFadden 1984), which follows Heckman's approach but takes the multinomial distribution of choices into consideration.

In turn, we needed a comparable sample of firms that did not participate in any type of alliance. Consistent with Swaminathan and Moorman (2009), for each firm in our sample, we randomly chose two firms within ±25% of their size in the same industry (four-digit SIC code) from Compustat that did not participate in any type of marketing alliance in that year. Such firms offer a reasonable proxy for the set of firms that could participate in alliance activities but chose not to do so. We used the firms that did not participate in any type of alliance as the baseline. The probability of a firm engaging in alliance form i reflects the following multinomial distribution:

$$(1) \qquad \Pr(y = i) = \frac{\exp(\alpha_i x_i)}{1 + \sum_i \exp(\alpha_i x_i)},$$

where $i = 1$ if the firm engaged in a dyadic alliance, $i = 2$ if the firm engaged in a plural alliance, α_i stands for the coefficients,

and x_i indicates firm- and industry-level factors that may contribute to the firm's probability to form a dyadic (plural) alliance. We included all firm- and industry-level variables from the return model (Equations 3 and 4). As an exclusion variable, we also controlled for the frequency of competitors' alliance formation in the year prior to the upstream firm's alliance formation, which directly affected the upstream firm's alliance decision but had no direct effect, or just indirect effects at best, on the upstream firm's returns. Using data from the SDC database, we measured the number of alliances formed by firms in the same four-digit SIC code. By taking the log-transformation of Equation 1, we have:

$$(2) \qquad \text{Ln} \Pr(y = i) = \alpha_{i1} \text{Upstream firm experience}_{i,t}$$
$$+ \alpha_{i2} \text{Upstream firm reputation}_{i,t}$$
$$+ \alpha_{i3} \text{Industry growth}_{i,t}$$
$$+ \alpha_{i4} \text{Industry competitiveness}_{i,t}$$
$$+ \alpha_{i5} \text{Firm size}_{i,t}$$
$$+ \alpha_{i6} \text{Industry dynamism}_{i,t} + \alpha_{i7} \text{R\&D intensity}_{i,t}$$
$$+ \alpha_{i8} \text{Marketing intensity}_{i,t}$$
$$+ \alpha_{i9} \text{Competitors' alliance frequency}_{i,t}$$
$$+ \text{Year dummies} + v_{i,t}.$$

The residual team v_i meets the normality statistical condition. We used STATA selmlog and generated coefficients for

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[3]We thank an anonymous reviewer for this suggestion.

multinomial logit self-selection coefficient (ρ_i) for the dyadic ($i = 1$) and plural ($i = 2$) alliances, then used these results as an additional control variable.

Model estimation and results. We then estimated the following model for dyadic and plural alliances separately and performed the Chow test on the intercept (for H_1) and independent variables (H_2–H_6) to determine how their effects on alliance performance are different between the two groups (Banerjee, Prabhu, and Chandy 2015; Mayer and Nickerson 2005). In both samples, the statistically significant panel unit root test (dyadic sample: $\chi^2 = -29.29$, $p < .01$; plural sample: $\chi^2 = -31.04$, $p < .01$) indicated that they were stationary (Cameron and Trivedi 2005). Second, Durbin–Watson statistics (Baltagi and Wu 1999) suggested that serial correlation was not a significant problem (dyadic sample: .18, n.s.; plural sample: .19, n.s.). For ease of interpretation, we mean-centered all variables. We used robust standard errors to take account of two-stage estimation (Heckman 1979).

(3) Plural structure alliance performance

$$(\text{Abnormal stock return of upstream firm})_{i,t}$$

$$= \beta_{a0} + \beta_{a1}\text{Alliance type}_{i,t}$$

$$+ \beta_{a2}\text{Upstream firm experience}_{i,t}$$

$$+ \beta_{a3}\text{Upstream firm reputation}_{i,t}$$

$$+ \beta_{a4}\text{Industry growth}_{i,t}$$

$$+ \beta_{a5}\text{Industry competitiveness}_{i,t}$$

$$+ \text{Control variables} + \varepsilon 1_{i,t}, \text{ and}$$

(4) Dyadic structure alliance performance

$$(\text{Abnormal stock return of upstream firm})_{i,t}$$

$$= \beta_{b0} + \beta_{b1}\text{Alliance type}_{i,t}$$

$$+ \beta_{b2}\text{Upstream firm experience}_{i,t}$$

$$+ \beta_{b3}\text{Upstream firm reputation}_{i,t}$$

$$+ \beta_{b4}\text{Industry growth}_{i,t}$$

$$+ \beta_{b5}\text{Industry competitiveness}_{i,t}$$

$$+ \text{Control variables} + \varepsilon 2_{i,t}.$$

Table 3 shows the estimation results. Models 1 and 2 test plural and dyadic structure alliance performance, respectively. For H_1, regarding the main effects of plural versus dyadic structures, the intercept for the plural structure model (Model 1) should be significantly higher than that in the dyadic structure model (Model 2). The results in Table 3 show that for a plural structure, alliance performance is .0218, while for a dyadic structure, alliance performance is .0102, and the difference is significant (.0116, $p < .05$).

For the moderating effects, we compared the main effects of moderators in plural versus dyadic structures. Regarding the moderating effect of marketing alliance type, the effect of market alliance type on the upstream firm's return is .0089 ($p < .01$) in a plural structure and .0029 ($p < .01$) in a dyadic structure. The difference is significant (.0060, $p < .05$), in support of H_2, in which we predicted that a plural structure would outperform a dyadic structure to a greater degree when the alliance involved both product development and marketing activities rather than marketing activities alone.

Regarding the moderating effect of upstream firm–level factors, the effect of the upstream firm's experience is .0015 ($p < .05$) in a plural structure and .0002 (n.s.) in a dyadic structure. The difference is significant (.0013, $p < .05$), in support of H_3. However, we found no significant effect of the upstream firm's reputation in either a plural or a dyadic structure, and the difference is not significant (.0002, n.s.), so we cannot confirm H_4. These differential moderating effects of alliance experience and reputation suggest the relative importance of the upstream firm's experience-based capability compared with its attractiveness associated with reputation to manage an alliance with its downstream partners. One possible explanation is that the control through reputation relies on the partners' motivation to respond to the upstream firm's attractiveness (Podolny 2001), and thus it does not necessarily provide a mechanism to enforce the downstream partners to be more cooperative. In contrast, firms with more past alliance experience will develop a capability to direct their partners to be more cooperative.

Regarding the moderating effect of industry-level factors, the effect of industry growth is .0321 ($p < .01$) in a plural structure and .0299 ($p < .01$) in a dyadic structure, but the difference is not significant (.0022, n.s.), failing to support H_5. This empirical result suggests that forming a new alliance, regardless of its structure, is beneficial in a rapidly growing industry. Finally, the effect of industry competitiveness in a plural structure ($\beta = -.0399$, $p < .01$) is lower than that in a dyadic structure ($\beta = -.0183$, $p < .05$), and the difference is significant ($-.0216$, $p < .05$), failing to support H_6. One possible explanation is that because downstream partners find more alternative upstream firms in a competitive upstream market environment, they are less committed to the relationship and less willing to share information with the upstream firm because they prefer to maintain flexibility among the many competitive alternatives (Folta 1998). Therefore, learning becomes less efficient, and the upstream partner benefits more from a dyadic than a plural structure in developing more exclusive, closely linked relationships with a chosen downstream partner to offset its inefficient learning in the competitive market environment. Overall, the results indicate that although plural structures generate greater returns than dyadic structures for the upstream firm, this effect varies with alliance-, upstream firm–, and industry-level factors.

Counterfactual analysis. To provide additional support for our hypotheses, we used these findings to conduct a counterfactual analysis to comparatively assess alliance performance between plural and dyadic structures.[4] We focus our analysis on the variables with significant differences in Chow's test in Table 3 (marketing alliance type, firm experience, and industry competitiveness). Specifically, we compare the performance of a dyadic structure when organized as predicted (i.e., dyadic) versus the opposite to the prediction (i.e., if the firm had chosen a plural instead of a dyadic structure) under different moderating conditions. That is, we used the predicted alliance performance from Model 2 in Table 3 (dyadic structure) and compared it

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[4]We thank an anonymous reviewer for this suggestion.

Table 3

STUDY 1 RESULTS: EFFECT OF PLURAL VERSUS DYADIC MARKETING STRUCTURES ON ALLIANCE PERFORMANCE

| | Alliance Performance | | | | | |
| | Model 1: Plural Structure | | Model 2: Dyadic Structure | | | Difference (Significance |
Variables	β	SE	β	SE	Hypotheses	Based on Chow's Test)
Intercept	.0218***	.0046	.0102**	.0043	H_1 (+)	.0116**
Main Effects						
Marketing alliance type	.0089***	.0031	.0029	.0033	H_2 (+)	.0060**
Upstream firm experience (Firm experience)	.0015**	.0006	.0002	.0007	H_3 (+)	.0013**
Upstream firm reputation (Firm reputation)	.0033	.0029	.0031	.0031	H_4 (+)	.0002 (n.s.)
Industry growth	.0321***	.0114	.0299***	.0105	H_5 (+)	.0022 (n.s.)
Industry competitiveness	−.0399***	.0132	−.0183**	.0111	H_6 (+)	−.0216**
Control Variables						
Firm size	−.0057***	.0016	−.0062***	.0018		
Downstream partner power	.0004	.0025	.0002	.0021		
Industry dynamism	−.0189	.0202	−.0164	.0187		
Alliance equity arrangement	.0036**	.0019	.0041**	.0021		
R&D intensity	.0192**	.0095	.0221**	.0099		
Marketing intensity	.0051	.0032	.0055	.0035		
Self-selection coefficient (ρ)	.0017	.0021	.0019	.0020		
Number of observations	324		604			
Adjusted R-square	.2248		.2082			

*$p < .10$.
**$p < .05$.
***$p < .01$.
Notes: Year dummies are not included for presentation brevity.

with the prediction obtained by applying coefficients in Model 1 in Table 3 (plural structure) to the sample observations of dyadic structure. Following Mayer and Nickerson (2005) and Ghosh and John (2009), when assessing a single independent variable (i.e., marketing alliance type, firm experience, or industry competitiveness), the other independent variables and control variables are held at their sample means. Furthermore, consistent with Mayer and Nickerson and Ghosh and John, we did not include the inverse Mills ratio in our estimate.

Figure 2 displays the results of our counterfactual analysis. Regarding the moderating effect of marketing alliance type, for dyadic structure, the returns are 1.31 from marketing/product alliance and 1.02 from marketing alliance only, with a difference of .29. If the firm had chosen plural structure, the difference becomes larger, .80, as we show in Figure 2, Panel A.

Regarding the moderating effect of upstream firm experience, as Figure 2, Panel B, illustrates, for dyadic structure, the returns are 1.03 when firm experience is high (two standard deviation above the mean) and .98 when firm experience is low (two standard deviation below the mean), with the difference of .05. If the firm had chosen a plural structure, the difference becomes larger (1.44). Finally, for the moderating effect of industry competitiveness, as we show in Figure 2, Panel C, for dyadic structure, the returns are .42 when industry competitiveness is high and 1.62 when industry competitiveness is low, with the difference of 1.20. If the firm had chosen a plural structure, the difference becomes larger (2.69).

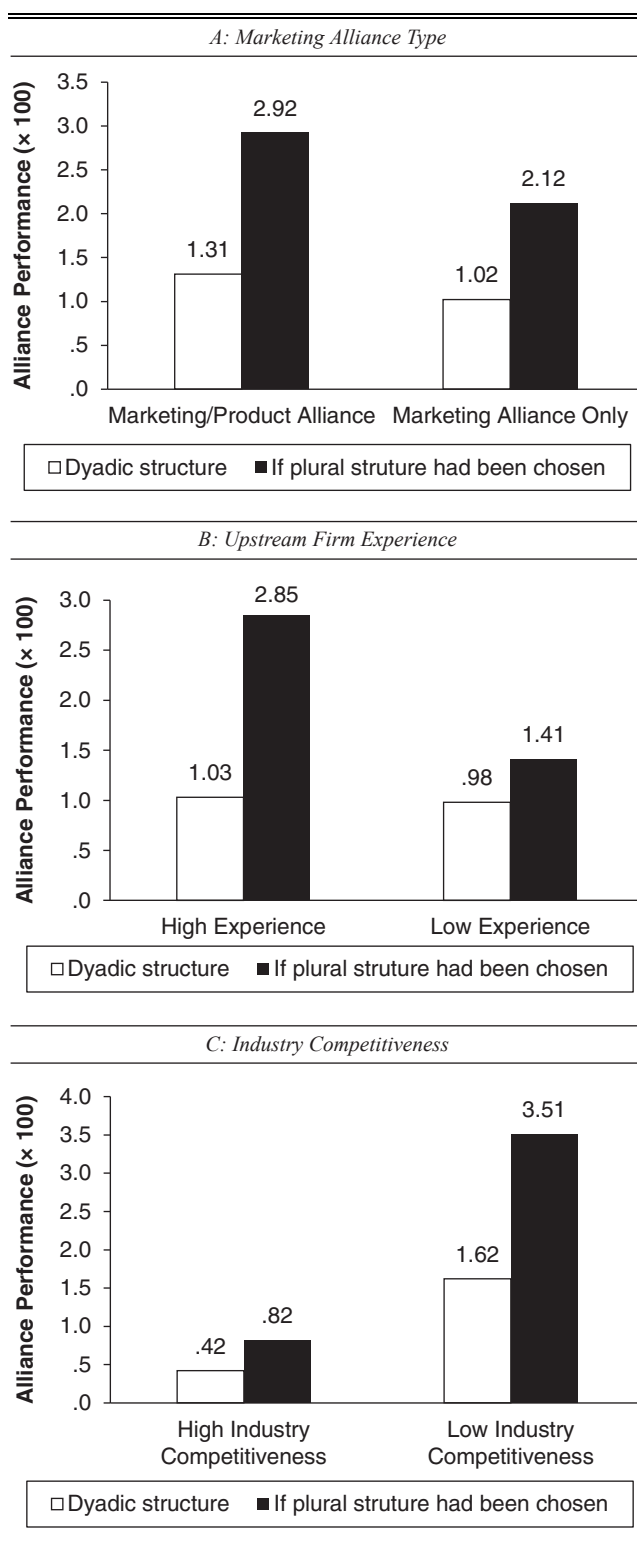These results are consistent with our main findings in Table 3.

Pooled sample analysis. To validate our results, we conducted additional analyses by pooling the samples of dyadic and plural structures. In this analysis, we created a dummy variable, plural structure, which took a value of 1 if the alliance is a plural alliance and 0 if it is a dyadic one, and interacted it with relevant independent variables.

(5)

$$
\begin{aligned}
&\text{Alliance performance (Abnormal stock return of upstream firm)}_{i,j} \\
&= \beta_{c0} + \beta_{c1}\text{Plural structures}_{i,t} + \beta_{c2}\text{Alliance type}_{i,t} \\
&\quad + \beta_{c3}\text{Upstream firm experience}_{i,t} \\
&\quad + \beta_{c4}\text{Upstream firm reputation}_{i,t} + \beta_{c5}\text{Industry growth}_{i,t} \\
&\quad + \beta_{c6}\text{Industry competitiveness}_{i,t} + \beta_{c7}\text{Plural structures}_{i,t} \\
&\quad \times \text{Alliance type}_{i,t} + \beta_{c8}\text{Plural structures}_{i,t} \\
&\quad \times \text{Upstream firm experience}_{i,t} + \beta_{c9}\text{Plural structures}_{i,t} \\
&\quad \times \text{Upstream firm reputation}_{i,t} + \beta_{c10}\text{Plural structures}_{i,t} \\
&\quad \times \text{Industry growth}_{i,t} + \beta_{c11}\text{Plural structures}_{i,t} \\
&\quad \times \text{Industry competitiveness}_{i,t} \\
&\quad + \text{Control variables} + \varepsilon 3_{i,t}.
\end{aligned}
$$

The results presented in Table 4 show that the interaction effects are significant and consistent with the results reported in Table 3, except for the moderating effect of industry growth, which is significant ($\beta = .0278$, $p < .05$), in support of H_5.

Figure 2
RESULTS: COUNTERFACTUAL ANALYSIS

A: Marketing Alliance Type

□ Dyadic structure   ■ If plural struture had been chosen

B: Upstream Firm Experience

□ Dyadic structure   ■ If plural struture had been chosen

C: Industry Competitiveness

□ Dyadic structure   ■ If plural struture had been chosen

Robustness Analysis

We conducted further analyses to confirm the robustness of our results to (1) plural structure alliances involving more than two partners, (2) multiple dyadic alliances, and (3) relative reputation. As we detail in Web Appendix B, the results remained consistent across these additional analyses.

STUDY 2: EFFECTIVENESS OF PLURAL MARKETING STRUCTURES

In Study 2, we narrow our focus to only plural structures to explore their key and unique aspect—namely, horizontal relationships between downstream partners combined with more typical vertical relationships. The horizontal relationship in an alliance entails both competitive and cooperative pressures (Luo, Rindfleisch, and Tse 2007), which can influence learning and dependence balancing. Specifically, we consider market overlap and a prior relationship between downstream partners as horizontal relationship factors, and we investigate how they interact with upstream firm–level factors to determine the effectiveness of plural structures.

Effects of Downstream Partners' Horizontal Relationships on the Upstream Firm's Return

Market overlap. In plural alliances, downstream partners may be less cooperative when their markets overlap, suppressing the upstream firm's learning from downstream partners. In overlapping markets, downstream firms face a greater risk of dysfunctional competition, including the threat of opportunistic exploitation of any shared knowledge to obtain private gains (Luo, Rindfleisch, and Tse 2007). The risk of dysfunctional competition between downstream partners makes them less cooperative and thus hinders learning from the plural structure alliance. Alternatively, downstream partners' market overlap enhances the upstream firm's ability to balance dependence because its two downstream partners are more similar; thus, it can more readily use them as substitutes, which should enhance the upstream firm's dependence balancing (Emerson 1962). Because market overlap between downstream partners can have opposing effects—suppressing learning while facilitating dependence balancing—the net effect on upstream firm performance is indeterminate.

However, the upstream firm–level factors of experience and reputation likely beneficially moderate these opposing effects of market overlap by enabling the upstream firm to coordinate its competing downstream partners and encourage more effective learning. The upstream firm's past alliance experience, which includes learning from both positive and negative experiences, should provide the firm with enhanced alliance management capabilities (Kale, Dyer, and Singh 2002) and help relieve the competitive tension between downstream partners. Experience-generated abilities should be especially important in plural structures when downstream partners are in overlapping markets because in this challenging business environment, superior management capabilities should pay off more. Similarly, upstream firms with better reputations should prompt downstream partners to cooperate and share information, because their reputation makes the upstream firms more attractive partners, which downstream firms aim to accommodate (Kang, Mahoney, and Tan 2009). In addition, an upstream firm with a better reputation can more easily sanction or impose penalties on less cooperative downstream partners by drawing more

Table 4

STUDY 1 RESULTS: POOLED SAMPLE ANALYSIS

Variables	Hypotheses	Model 1	
		β	SE
Intercept		.0101***	.0034
Main Effects			
Plural marketing structures (relative to dyadic)	H$_1$ (+)	.0045*	.0027
Marketing alliance type		.0051	.0036
Upstream firm experience (Firm experience)		.0011	.0008
Upstream firm reputation (Firm reputation)		.0031	.0035
Industry growth		.0297**	.0132
Industry competitiveness		−.0187	.0151
Plural marketing structures × Marketing alliance type	H$_2$ (+)	.0082**	.0038
Plural marketing structures × Firm experience	H$_3$ (+)	.0029***	.0012
Plural marketing structures × Firm reputation	H$_4$ (+)	.0022	.0028
Plural marketing structures × Industry growth	H$_5$ (+)	.0278**	.0147
Plural marketing structures × Industry competitiveness	H$_6$ (+)	−.0419***	.0163
Control Variables			
Firm size		−.0058***	.0019
Downstream partner power		.0003	.0029
Industry dynamism		−.0164	.0247
Alliance equity arrangement		.0032	.0021
R&D intensity		.0185**	.0114
Marketing intensity		.0038	.0037
Self-selection coefficient (ρ)		.0014	.0023
Number of observations		928	
Adjusted R-square		.2802	

*$p < .10$.
**$p < .05$.
***$p < .01$.
Notes: Year dummies are not included for presentation brevity.

attention from other firms (Kim and Laumann 2003). Thus, the net effect of market overlap between downstream partners on upstream firm performance should improve when the upstream firm has more experience or a better reputation.

H$_7$: The effect of market overlap between downstream partners on the upstream firm's abnormal returns from a plural structure is positively moderated (i.e., more positive or less negative) by greater upstream firm (a) experience and (b) reputation.

Prior relationships between downstream partners. In plural alliances, downstream partners may be more willing to cooperate and share information when they have a prior relationship. They perceive less risk of knowledge leakage or damage to their business because they have developed higher levels of trust and existing communication and conflict resolution processes through their prior relationships (Gulati 1995; Uzzi 1997). Such cooperation should enhance learning efficiency in the plural structure alliance, which in turn should improve the upstream firm's performance. Alternatively, downstream partners with existing relationships might undermine the upstream partner's ability to balance dependence because, in plural alliances, they might align their actions and jointly hold up the upstream firm to enhance their collective bargaining power over it (Heidl, Steensma, and Phelps 2014). Dependence balancing becomes more challenging for the upstream firm because it cannot treat the two downstream partners

differently (i.e., "divide and conquer"). Thus, a prior relationship between downstream partners may have opposing effects on returns to the upstream firm: it enhances learning efficiency but suppresses dependence balancing.

However, the upstream firm–level factors of experience and reputation likely beneficially moderate these opposing effects of downstream partners' prior relationships by enabling the upstream firm to manage its ongoing relationships and increasing the value of the upstream firm as an alliance partner. Specifically, upstream firms' past alliance experience increases their relationship-management capabilities and helps suppress the risk of coordinated holdup from downstream partners' relationship ties. Similarly, upstream firms with better reputations are more valuable as alliance partners, which may help suppress downstream partners' willingness to hold up resources, even though their past relationship would enable them to do so. An upstream firm with a better reputation can more easily sanction less cooperative downstream partners, which reduces the likelihood of downstream partners using their collective bargaining power (Kim and Laumann 2003). Thus, the net effect of past relationships between downstream partners on upstream firm performance should improve when the upstream firm has more experience or a better reputation.

H$_8$: The effect of prior relationships between downstream partners on the upstream firm's abnormal returns from a plural structure is positively moderated (i.e., more positive or

less negative) by greater upstream firm (a) experience and (b) reputation.

Research Approach and Measures

In Study 2, we focus on the plural marketing alliances from Study 1 and introduce two new constructs: market overlap and prior relationships between downstream partners. The overlap of markets stimulates competitive behaviors by downstream firms, such as price cuts, advertising, or new product introductions, to attract and serve customers better than other firms (Fuentelsaz and Gómez 2006; Stassen, Mittelstaedt, and Mittelstaedt 1999). Two market features—product/service and geographic scope—are relevant when evaluating market overlap, in that they drive competition (Brynjolfsson, Hu, and Rahman 2009; Chiou 2009). When they operate in markets that overlap with those of other firms, downstream firms face more competition than if they operate in markets with less overlap (Brynjolfsson, Hu, and Rahman 2009). To examine the market overlap of two downstream partners, we assess two domains: product/service and geographic markets. We coded market overlap as high (= 3) if they overlapped in both domains, average (= 2) if they overlapped in one domain, and low (= 1) if they overlapped in neither. In our sample, 36% of firms experienced high market overlap; for example, the biotech firm Genentech worked with two pharmaceutical firms, Pfizer and Merck, to develop and sell a new drug, and Pfizer and Merck overlapped in both product and geographic markets. We found average market overlap for 44% of our sample, such as when IBM worked with Sun Systems and Epoch to promote IBM systems. Sun and Epoch overlap in their geographic markets but not in their product markets. Finally, the remaining 20% of our sample provided low market overlap; SAP software worked with SAIC, an auto manufacturer in China, and Toshiba in Japan to develop and promote custom solutions.

To collect product/service and geographic market information about the downstream partners, we consulted various sources, including Compustat business segment data for public companies, databases such as Hoover's and Factiva for private companies, and company websites. Two research assistants independently coded market overlap as high, average, or low. Their interrater reliability was high (.92); for cases in which they did not reach agreement, they and a researcher discussed the coding until they reached consensus. Consistent with prior studies (e.g., Swaminathan and Moorman 2009), we used a five-year window prior to the alliance announcement to examine the presence or absence of any past relationship between the two downstream partners (1 = presence, 0 = absence), according to data from the SDC database.

Model Analysis

We adopted an approach similar to the one we used in Study 1 and included the same control variables. For ease of interpretation, we mean-centered all variables with interaction effects. Formally, the model setup is:

(6)

$$
\begin{aligned}
&\text{Alliance performance (Abnormal stock return of upstream firm)}_{i,t} \\
&= \alpha_o + \alpha_1 \text{Market overlap between downstream partners}_{i,t} \\
&\quad + \alpha_2 \text{Prior relationship between downstream partners}_{i,t} \\
&\quad + \alpha_3 \text{Upstream firm experience}_{i,t} \\
&\quad + \alpha_4 \text{Upstream firm reputation}_{i,t} \\
&\quad + \alpha_5 \text{Market overlap between downstream partners}_{i,t} \\
&\quad\quad \times \text{Upstream firm experience}_{i,t} \\
&\quad + \alpha_6 \text{Market overlap between downstream partners}_{i,t} \\
&\quad\quad \times \text{Upstream firm reputation}_{i,t} \\
&\quad + \alpha_7 \text{Prior relationship between downstream partners}_{i,t} \\
&\quad\quad \times \text{Upstream firm experience}_{i,t} \\
&\quad + \alpha_8 \text{Prior relationship between downstream partners}_{i,t} \\
&\quad\quad \times \text{Upstream firm reputation}_{i,t} + \text{Control variables} + \varepsilon_{i,t}.
\end{aligned}
$$

We used the same self-selection model as in Study 1 but only applied the multinomial logit self-selection coefficient (ρ_2) for observations of a plural structure alliance, which we included in Equation 6 to control for potential selection bias.

Model Results and Discussion

We present the model estimation results in Table 5. Model 1 included only main effects; Model 2 tested the interaction effects. In Model 2, the upstream firm's alliance experience and reputation both positively moderated the effects of market overlap between downstream partners on the upstream firm's returns ($\beta = .0025$, $p < .10$; $\beta = .0137$, $p < .01$, respectively), in support of H_{7a} and H_{7b}. Model 2 shows that the upstream firm's alliance experience positively moderated the effect of a prior relationship between downstream partners on the upstream firm's returns ($\beta = .0031$, $p < .05$), in support of H_{8a}. However, we found no significant moderating effect of the upstream firm's reputation on its returns due to a prior relationship between downstream partners ($\beta = .0041$, n.s.), so H_{8b} must be rejected.

Robustness Analysis

We conducted further analyses to confirm the robustness of our results to alternative measures of (1) the prior relationship between downstream partners, (2) the upstream firm's experience, and (3) market overlap. As we detail in Web Appendix B, the results remained consistent.

STUDY 3: SCENARIO-BASED EXPERIMENT

The results of Study 2 rely on two fundamental premises: First, market overlap between two downstream partners decreases learning effectiveness between downstream partners but improves dependence balancing of the upstream firm. Second, a prior relationship between downstream partners improves learning effectiveness but decreases dependence balancing. As an additional analysis, we explicitly tested these underlying arguments using a scenario-based experiment, in which we achieve some indication of the causality between the independent (i.e., market overlap

Table 5
STUDY 2 RESULTS: FACTORS INFLUENCING THE EFFECTIVENESS OF PLURAL MARKETING STRUCTURES

Variables	Hypotheses	Model 1		Model 2	
		β	SE	β	SE
Intercept		.0189*	.0113	.0176*	.0121
Main Effects					
Market overlap between downstream partners (Market overlap)		−.0044**	.0023	−.0049**	.0029
Prior relationship between downstream partners (Prior relationship)		.0014	.0033	.0012	.0036
Upstream firm experience (Firm experience)		.0017**	.0009	.0011	.0012
Upstream firm reputation (Firm reputation)		.0042	.0036	.0033	.0048
Factors Moderating the Effectiveness of Plural Marketing Structures					
Market overlap × Firm experience	H_{7a} (+)			.0025*	.0015
Market overlap × Firm reputation	H_{7b} (+)			.0137***	.0054
Prior relationship × Firm experience	H_{8a} (+)			.0031**	.0018
Prior relationship × Firm reputation	H_{8b} (+)			.0041	.0063
Control Variables					
Industry growth		.0356***	.0143	.0313**	.0164
Industry competitiveness		−.0317**	.0161	−.0308	.0188
Marketing alliance type		.0063	.0041	.0049	.0053
Firm size		−.0077***	.0022	−.0072***	.0028
Downstream partner power		.0001	.0029	.0001	.0033
Industry dynamism		−.0233	.0242	−.0201	.0250
Alliance equity arrangement		.0041**	.0023	.0038	.0026
R&D intensity		.0163	.0113	.0149	.0121
Marketing intensity		.0046	.0039	.0041	.0046
Self selection coefficient (ρ)		.0013	.0026	.0015	.0028
Number of observations		307		307	
Adjusted R-square		.2108		.2483	

*$p < .10$.
**$p < .05$.
***$p < .01$.
Notes: Year dummies are not included for presentation brevity.

and prior relationship) and dependent (learning and dependence balancing) variables.

Respondents and Procedures

Because alliance decisions in most organizations involve top-level executives (Cui and O'Connor 2012), we needed participants with similar profiles. We invited senior executives from one of the leading executive master's of business administration programs in China to participate and obtained usable responses from 86 participants, who indicated sufficient expertise and a high level of involvement in their organization's strategic alliance activities (six or higher on a seven-point scale). We assigned the participants to conditions in a 2 (upstream firm vs. downstream partner) × 2 (market overlap: high vs. low) × 2 (presence of prior relationship: yes vs. no) between-subjects design. We differentiated the upstream firm and downstream partner perspectives to gather the measures of learning effectiveness between downstream partners from downstream partners and the measures of the dependence balancing effectiveness of upstream firms from the upstream firm.[5] Web Appendix C provides detailed descriptions of the experimental procedures, measures, manipulation checks, and demographic items.

[5]We thank an anonymous reviewer for this suggestion.

Results

The results of an analysis of variance suggested that from the perspective of downstream partners, when their market overlap is high, learning effectiveness between them is significantly lower (3.54 vs. 4.24; $F(1, 38) = 11.23, p < .01$). When they have previously been in a relationship, their learning effectiveness is significantly higher than if they have no prior relationship (4.52 vs. 4.11; $F(1, 38) = 3.72, p < .05$). For the upstream firms, high market overlap between the two downstream partners significantly increases dependence-balancing effectiveness (3.93 vs. 3.25; $F(1, 44) = 9.14, p < .01$), and in the presence of a prior relationship, dependence-balancing effectiveness is significantly lower than without any relationship (3.30 vs. 3.84; $F(1, 44) = 7.03, p < .05$). These results support the arguments underlying Study 2.

DISCUSSION

Working with downstream partners is an important component of a firm's strategies to access new markets, products, brands, knowledge, or skills. Marketing alliances more often include collaborations with multiple downstream firms in a single alliance. In our first event study, we investigated when a plural structure outperforms a dyadic structure while accounting for the moderating effects of alliance-, upstream firm–, and industry-level factors. In the

second event study, we investigated which factors determine the effectiveness of a plural structure and how horizontal relationship–level factors interact with upstream firm–level factors to affect the upstream firm's returns from a plural structure alliance. With our experimental study, we confirmed the theoretical arguments underlying Study 2.

Theoretical Implications

Whereas prior research on marketing alliances has focused almost exclusively on dyadic structures, we expand the focus to a plural structure involving multiple downstream partners in an alliance. Some research has examined the challenges or costs associated with multipartner alliances, such as incomplete contracts, coordination difficulty, and higher failure risks (Gong et al. 2007), but the current study enhances our understanding of a plural structure alliance by considering the role of plural versus dyadic structures in facilitating or suppressing learning and dependence balancing.

Their contingent effects on the upstream firm's returns across alliance-, upstream firm–, and industry-level factors largely support the two mechanisms we proposed. Specifically, at the alliance level, a plural structure is more beneficial for marketing alliances involving both product and marketing objectives rather than only marketing objectives. These findings support our argument that a plural structure, compared with a dyadic one, better supports the upstream firm's dependence balancing because the broader task domains provide more alternatives to the upstream firm to arbitrage across the downstream firms. At the upstream firm level, alliance experience can improve learning efficiency when working with multiple downstream partners. At the industry level, the upstream firm benefits more from a plural than a dyadic structure as the industry grows faster. Dependence balancing across multiple partners also becomes more important as a means to overcome information asymmetry with downstream partners in a fast-growing industry.

Study 2 reveals the unique nature of a plural structure that results from interactions between vertical and horizontal relationship components in an alliance. Prior network research has examined interactions that occur with multiple partners in a network composed of individual alliances, such as a dyadic relationship embedded in a broader relationship network (Anderson, Hakansson, and Johanson 1994; Swaminathan and Moorman 2009). Although a plural structure also involves multiple downstream partners, our findings suggest that the interactions that occur in a plural structure differ from those in a relationship network. Specifically, a plural structure involves the development of a joint team or entity composed of an upstream firm and its multiple downstream partners in an alliance. As a team, they unite their resources and interact to achieve their commonly agreed-upon goals. In contrast, a network is composed of multiple alliances, which are not likely to have common objectives, and thus interactions are not necessarily expected among firms in the alliance network. As such, although both involve multiple partners, the specific form of interactions are different: while network research has emphasized the structural aspect of a firm's alliance network, such as centrality, density, or structural holes

(Ahuja 2000; Owen-Smith and Powell 2004; Swaminathan and Moorman 2009), as a firm's performance determinants, our findings imply that a particular form of interaction (i.e., interaction between vertical and horizontal relationships in an alliance) is a critical performance determinant in a plural structure.

Finally, this article contributes to research into supplier–original equipment manufacturer (OEM) relationships. For example, prior studies have highlighted the critical role of supplier–OEM links for developing new products and conducting marketing activities (Fang 2008); we expand the scope to include a supplier that might work with multiple OEMs in an alliance. Dahlquist and Griffith (2014) suggest that component suppliers can enhance their profitability by increasing differentiation with OEMs and indirect industrial buyers. This study explicitly reveals the importance of learning and dependence balancing for managing such complex relationships. Ghosh, Dutta, and Stremersch (2006) show that component manufacturers use contrasting practices when offering customized products to OEMs, and they investigate the optimal level of control that suppliers should exert. Our results reveal that the optimal control by suppliers may be contingent on the number of OEMs involved (one or multiple).

Managerial Implications

This article offers important suggestions for managers who intend to initiate and manage a plural structure alliance, including (1) when to use plural structures and (2) how to manage them once implemented. First, the upstream firm must consider factors at three different levels to choose between plural and dyadic structures in a new vertical marketing alliance. At the alliance level, the upstream firm needs to consider a plural structure rather than a dyadic structure if the vertical marketing alliance targets both marketing- and product-related objectives. A plural structure also should be considered if the upstream firm has strong alliance experience; however, without experience, the upstream firm may not achieve greater returns from a plural (compared with a dyadic) structure. The upstream firm should be cautious about implementing a plural structure based on the expectation that its reputation will give it power to effectively manage complex plural alliances, because our results show that reputation is not an important factor for the relative effectiveness of plural versus dyadic structures. Finally, the upstream firm needs to avoid a plural structure if it faces high levels of competition in the market because dyadic structures perform better in this situation.

Second, our counterfactual analysis, which tested the expected performance changes of making the "wrong" choice of alliance structure, provides managers insight into the relative magnitude or importance of dyadic versus plural decisions under different conditions. If a firm is entering into a broad-scope partnership (e.g., marketing and product agreement) and is average in all other characteristics (e.g., experience, competitiveness), its abnormal positive stock returns will be 123% higher using a plural versus dyadic structure. Alternatively, a firm with high experience achieves 77% higher abnormal positive stock returns using a plural structure than dyadic structure. Finally, a firm with in an industry with low competitiveness gains 117% higher

abnormal positive stock returns using a plural structure than a dyadic structure.

Third, we offer guidance regarding how to achieve higher returns once the firm has decided to implement a plural structure. The upstream firm should align its capability with the horizontal relationship characteristics of its downstream partners. This study suggests the need to consider market overlap and prior relationship between downstream partners when initiating a plural structure. Specifically, a firm should initiate a vertical alliance with multiple downstream partners that have market overlap or prior relationships only if it has sufficient alliance capability gained through its past alliance experience.

Finally, our results provide managers with insights into guidelines for choosing multiple downstream partners for effective interactions within an alliance, as an important marketing tool, because it has a strong impact on firm performance. Managers should also recognize that the linkage between the choice of multiple downstream partners and performance is dependent on learning and dependence factors as well as environmental conditions.

Limitations and Further Research

This research suffers some limitations that suggest promising research opportunities. First, we focused on marketing alliances; these considerations also might extend to different alliances, such as technological or manufacturing alliances with multiple business customers or suppliers. Investigations of these alternative settings offer a promising means to test how vertical and horizontal relationship factors might interact to affect new product development by the upstream firm. Research into learning and dependence balancing in more diverse contexts could extend our understanding of plural structure alliances.

Second, we focused on the upstream firm, but downstream firms also can engage in plural structures by working with multiple upstream partners. Further research efforts are needed to test whether and how our conceptual framework applies to alliances in which a downstream firm works with multiple upstream partners. In such upstream alliances, different factors may influence alliance performance, such as the downstream firm's capability and experience to manage its interactions with multiple upstream partners in a single alliance.

Third, we used *Fortune*'s survey of America's Most Admired Corporations to measure reputation. Although it has been widely used in both management (e.g., Philippe and Durand 2011; Roberts and Dowling 2002) and marketing (e.g., Houston and Johnson 2000; Swaminathan and Moorman 2009) literature, its limitations also are well known. For example, the survey is conducted with a limited set of stakeholders, such as executives, directors, and analysts, but not customers, suppliers, employees, or interest groups. Furthermore, the survey does not consider relatively small firms (Deephouse 2000). Additional research that measures reputation by considering the perspectives of more diverse stakeholders is needed to confirm these results.

Fourth, although we did not distinguish the specific roles of each downstream partner, further research could investigate the division of tasks between downstream partners and test the impact of this division on returns from the plural structure alliance. For example, downstream partners may perform the same tasks together or each may take responsibility for different tasks (e.g., one performs marketing, the other performs R&D). Fifth, stock market returns are a widely used indicator of firm performance (Kalaignanam, Shankar, and Varadarajan 2007; Swaminathan and Moorman 2009), but further tests with more diverse performance measures, such as sales revenue, market share, or profits, could enrich understanding of the relative benefits of forming a plural or dyadic structure marketing alliance.

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Understanding the Effects of Plural Marketing Structures on Alliance Performance

Eric (Er) Fang, Jongkuk Lee, Robert Palmatier, and Chaoyang Guo

Web Appendix A
Abnormal Returns Based on Four-Factor Model

We adopted a four-factor model, which extends the market model by recognizing additional risk factors that may affect stock valuations (e.g., Srinivasan and Hanssens 2009). As a baseline, in the market model, $R_{i,t} = \alpha_i + \beta_i R_{m,t} + e_{i,t}$, where $R_{i,t}$ denotes the daily returns for firm i on day t, and $R_{m,t}$ is the daily returns on the equally weighted index (i.e., all stocks listed in CRSP). In addition, Fama and French (1992, 1996) propose a three-factor model of stock returns that features the difference in returns between large- and small-cap portfolios (size risk factor), the difference in returns between high and low book-to-market stocks (value risk factor), and a systematic risk factor (beta). Carhart (1997) extends this model by including a momentum factor:

$$(A1)\ R_{i,t} = \alpha_i + \beta_i R_{m,t} + s_i SMB_t + h_i HML_t + u_i UMD_t + e_{i,t},$$

where SMB_t (size factor) is the return on a value-weighted portfolio of small stocks minus the return of big stocks, HML_t (value factor) is the return on a value-weighted portfolio of high book-to-market stocks minus the return on a value-weighted portfolio of low book-to-market stocks, and UMD_t (momentum factor) is the average return on two high prior-return portfolios, minus the average return on two low prior-return portfolios. The data source for the four-factor financial model is Kenneth French's website (http://mba.tuck.dartmouth.edu/pages/faculty/ ken.french/data_library.html). We used the difference between actual and predicted returns on day t, with the four-factor model as the abnormal return on day t.

Following the procedure suggested by Swaminathan and Moorman (2009), we selected the

event window with the most significant t-statistics. Table A1 summarizes the cumulative

abnormal stock returns during each selected event window. We selected −2 to +1 days, which

produced the highest t-value.

Table A1
Abnormal Returns for Alternative Event Windows

Event Windows	Abnormal Stock Returns		
	Mean	SD	t-value
-3 to +3 days	0.017	0.056	2.874***
-2 to +2 days	0.018	0.055	3.103***
-1 to +1 days	0.017	0.052	3.004***
-1 to 0 days	0.014	0.046	2.258**
0 to 1 days	0.015	0.053	2.185**
-1 to +2 days	0.017	0.055	2.724***
-2 to +1 days	**0.019**	**0.049**	**3.373***

Robustness Analysis for Study 1

Robustness to plural marketing alliance involving more than two partners. The sample featured 86 observations of plural marketing alliances with more than two downstream partners, and we included these observations in our final sample of plural marketing alliances. The difference between plural and dyadic marketing alliances did not change with the inclusion of such plural marketing alliances.

Robustness to multiple dyadic alliances. We compared plural marketing alliances with multiple dyadic marketing alliances, to test whether a firm could achieve similar learning and dependence balancing benefits by forming multiple dyadic marketing alliances. For dyadic marketing alliances, we considered those in which the firm established at least one other dyadic marketing alliance in the prior year. The relative benefits of plural and dyadic marketing alliances did not change.

Robustness to relative reputation. We further tested with relative reputation of the upstream firm to its downstream partners. The relative reputation was calculated by subtracting upstream firm's reputation (1 if the upstream firm was listed among the most admired firms in any of the past five years, and 0 if not) by downstream partners' reputation (1 if any of the downstream partners were listed among the most admired firms in any of the past five years, and 0 if not). The results remained consist.

Robustness Analysis for Study 2

Robustness to alternative measures of presence of prior relationships. In our sample, we measured the existence of a prior relationship using the five-year window prior to the alliance

announcement. As a robustness analysis, we also used seven- and ten-year windows to measure the presence of prior relationships. The results were consistent.

Robustness to alternative measures of upstream firm experience. In our sample, we measured upstream firm experience as the number of alliances the firm established in the five-year period prior to the alliance announcement. As a robustness check, we measured upstream firm experience using the number of plural alliances the firm engaged in during the five-year period prior to the alliance announcement. The results were consistent.

Robustness to alternative measures of market overlap. In our sample, we included both geographic and product overlap as measures of market overlap. As a robustness check, we used only geographic overlap to measure market overlap (1 = geographic market overlap, 0 = no geographic market overlap) and obtained consistent results.

In addition, some downstream firms may operate in multiple segments. However, most of the downstream partners are private firms with no detailed sales in different product segments. As a robustness check, we checked the COMPUSTAT business segment database, which reports a firm's revenues in different product segments (i.e., SIC codes) for downstream firms that are also public firms (24 pairs). We obtained product overlap as the ratio of total revenues in overlapping product segments (same SIC codes) by total sales revenues across the two firms, and the correlation of this measure with our product overlap measure was high and significant at .57.

Respondent Profiles

The respondents' average age was 42 years, with average work experience of 19 years, and 21% were women. Furthermore, 56% were CEOs of their respective organizations, and the rest were other senior executives, such as chief operating officers, senior vice presidents, and so forth. Before the experiment, the respondents indicated their level of participation in their organization's strategic alliances activities; we retained only those with sufficient involvement levels (6 or higher on a seven-point scale), which led to 86 usable observations. Approximately 75% of the participants worked in high-tech manufacturing industries such as semiconductors, computer and related products, or medical devices.

Scenario Descriptions

Please carefully read the scenario below and imagine that you were the CEO of the firm.

Upstream Firm

Your firm is a mid-sized component manufacturing company, with about 4,000 employees, in the semi-conductor industry. The firm's annual revenue was about $3 billion RMB. Several months ago, the firm established a strategic alliance with TWO downstream OEM manufacturers to conduct joint product development and sales promotions, and these two downstream manufacturers were of similar size

Downstream Partner

Your firm is a mid-sized OEM manufacturing company, with about 8,000 employees, in the semi-conductor industry. The firm's annual revenue was about $6 billion RMB. Several months ago, your firm established a strategic alliance with one upstream component firm and another

OEM manufacturer in the same industry as your firm. The purpose of the alliance is to conduct

joint product development and sales promotions. The other OEM manufacturer and your firm

were of similar size

High Market Overlap

The two downstream OEM manufacturers operate in overlapping geographic markets.

Therefore, these two firms compete with each other over the same group of customers.

Low Market Overlap

The two downstream OEM manufacturers operate in different geographic markets.

Therefore, these two firms are not direct competitors.

Presence of Prior Relationship

Before this alliance, two downstream OEM manufacturers had been working together in

another alliance.

Absence of Prior Relationship

This is the first time that the two downstream OEM manufacturers work together. Before this

alliance, these two firms did not have any past business relationship with each other.

Manipulation Check

As a manipulation check, participants responded to an item asking, "How high is the market

overlap between the two downstream OEM manufacturers?" on a seven-point scale. Those in the

high market overlap rated this question significantly higher than those in market overlap

condition (5.26 vs. 3.65; $F(1, 84) = 29.49$, $p < .01$). In addition, all participants correctly

identified whether the two downstream OEM had past relationships, as specified in the

conditions.

Measures

All measures used seven-point Likert scales ("strongly disagree" to "strongly agree").

Learning effectiveness between downstream partners (Selnes and Sallis 2003; composite

reliability = .91) (downstream OEM partners)

1. In this alliance, the other OEM manufacturer and we are likely to exchange information related to changes in the technology of products. (factor loading = .84)
2. In this alliance, it would be common for the other OEM manufacturer and us to establish common procedures to solve operational problems and discuss strategic issues. (factor loading = .87)
3. The atmosphere in this alliance is likely to stimulate productive discussion encompassing a variety of opinions. (factor loading = .84)
4. In this alliance, the other OEM manufacturer and we are likely to engage in active learning from each other to improve each other's business operations. (factor loading = .90)

Dependence balancing effectiveness from upstream firm[1] (Ganesan 1994; composite reliability

= .84) (upstream manufacturer)

1. We can manage both downstream manufacturers so that neither one of them becomes too powerful. (factor loading = .87)
2. If our relationship with either one of the downstream OEM manufacturers discontinues, we are able to make up the sales volume from the other partner. (factor loading = .83)
3. It would be very difficult for us to replace either one of the downstream OEM manufacturers (reverse coded). (factor loading = .73)
4. We can use our power in the alliance to influence the decisions of our downstream OEM manufacturers. (factor loading = .76)

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[1] Market overlap between downstream partners would help the upstream firm balance the structural dependence because the overlapping downstream partners can be replaced with each other more easily. In contrast, prior relationship between downstream partners can cause a greater difficulty in balancing dependence associated with decision control because the prior relationship makes it difficult to treat each downstream partner differently. We therefore measured the effectiveness of balancing these two aspects of dependence (i.e., structural dependence and decision control).

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