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Alliance Competence, Resources, and Alliance Success: Conceptualization, Measurement, and Initial Test

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This research examines the effect of an alliance competence on resource-based alliance success. The fundamental thesis guiding this research is that an alliance competence contributes to alliance success, both directly and through the acquisition and creation of resources. Using survey data gathered from 145 alliances, empirical tests of the hypotheses provide support for the posited explanation of alliance success. The findings indicate that an alliance competence is not only antecedent to the resources that are necessary for alliance success but also to alliance success itself.

Alliances are broadly defined as collaborative efforts between two or more firms in which the firms pool their resources in an effort to achieve mutually compatible goals that they could not achieve easily alone (Bucklin and Sengupta 1993; Day 1995; Heide and John 1990; Sividas and Dwyer 2000; Varadarajan and Cunningham 1995; Varadarajan and Rajaratnam 1986). Resources here are defined as any tangible or intangible entity (e.g., physical assets and/or capabilities) available for use by a firm to

compete in its marketplace (Hunt and Morgan 1995). When interfirm business relationships are collaborative, rather than adversarial in nature, a variety of types of these relationships may be classified as alliances, for example, manufacturer-supplier partnerships, strategic purchasing arrangements, joint ventures, outsourcing, technology licensing agreements, and various forms of R&D consortia (Morgan and Hunt 1994; Varadarajan and Cunningham 1995).

The popularity of alliances is growing. Booz, Allen, and Hamilton estimate that more than 20,000 alliances were formed in 1995 and 1996 (Harbison and Pakar 1997). Indeed, research by Accenture indicates that alliances

account for anywhere from 6 percent to 15 percent of the market value of the typical company . . . [and are] expected to account for 16 percent to 25 percent of median company value within five years and, astonishingly, more than 40 percent of market value for almost one-quarter of companies. (Kalmbach and Roussel 1999:5)

Yet, alliance success remains elusive. Studies find that as many as 70 percent of alliances are not successful (Day 1995). Thus, an important question for researchers and practicing managers is, *What makes alliances succeed?*

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Researchers argue that both relational factors (e.g., trust and commitment) and nonrelational resources (e.g., complementary and idiosyncratic) contribute to alliance success (Day 1995; Ganesan 1994; Hunt 1997; Jap 1999; Morgan and Hunt 1994; Varadarajan and Cunningham 1995). However, although an extensive body of research examines the development of relational factors that enhance alliance performance, there is little research on how alliances successfully *acquire and create* the complementary and idiosyncratic *resources* that facilitate competitive advantage and superior financial performance. In addition, there is little research on a construct that we argue promotes the acquisition and creation of such resources in alliances: an *alliance competence*. We define such a competence as an organizational ability for finding, developing, and managing alliances. Therefore, in this article, we conceptualize the construct of alliance competence, develop a measure for it, and test a model that examines its effect on alliance resources and alliance success.

The fundamental thesis that guides our research is that an alliance competence contributes to alliance success because such a competence has (1) a direct positive effect on alliance success, (2) an indirect effect on alliance success by positively influencing the *acquisition* of complementary resources, and (3) an indirect effect on alliance success by positively influencing the *creation* of idiosyncratic resources. This article is organized as follows. After reviewing resource-based and competence-based theories that are used to explain alliance performance, we draw on these theories to develop hypotheses that offer an alliance competence model of resources and alliance success. We then test our model using structural equation modeling and a sample of 145 alliances. We end by discussing our results and suggesting topics for future research.

BACKGROUND ON RESOURCES AND BUSINESS PERFORMANCE

Researchers have begun to explore how firms use alliances to gain the resources needed to develop and maintain competitive advantage (e.g., Day 1995; Hunt 1997; Varadarajan and Cunningham 1995). In so doing, marketing scholars have turned to theories from business strategy, resource based and competence based, to explain alliance performance. A *resource-based view of the firm* (RBV) is one resource-based theory that has been used to explain alliance performance (Barney 1991; Day 1995; Jap 1999; Varadarajan and Cunningham 1995). The fundamental thesis of RBV is that firm resources (to varying degrees) are both significantly heterogeneous and imperfectly mobile (Conner 1991; Hunt and Morgan 1995; Wernerfelt 1984). Resource heterogeneity means that each and every firm has an assortment of resources (e.g., distribution networks, manufacturing capabilities, research and

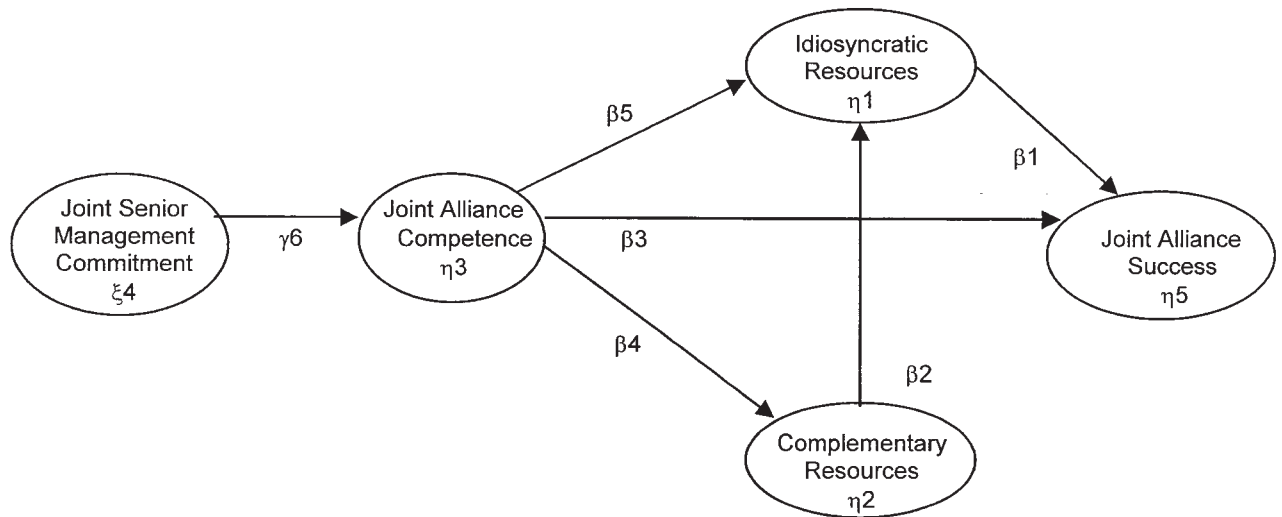
development capabilities, and employees with special skills) that is at least in some ways unique. Imperfectly mobile implies that firm resources, to varying degrees, are not commonly, easily, or readily bought and sold in the marketplace (the neoclassic factor markets). Because of resource immobility, resource heterogeneity can persist through time despite attempts by firms to acquire the same resources of particularly successful competitors.

From an RBV perspective, resource heterogeneity leads to competitive advantage when the resources are (1) valuable, (2) rare, (3) durable, and (4) inimitable (Barney 1991, 1992). Resources that are valuable contribute to competitive advantage because they enhance the ability of a firm to create superior customer value and/or have lower costs. Rare resources are those that few competitors have. Durable resources maintain their value over time, that is, they are not highly vulnerable to obsolescence or depreciation. Inimitable resources are those that competitors cannot duplicate readily. RBV suggests that when a firm has resources that possess all four of these attributes, it will achieve a sustainable competitive advantage because it will produce for its customers products of higher value (and/or lower cost) than its competitors.

Although much of the recent research on alliance success specifically cites RBV, *competence-based theory* provides a *complementary* explanation of alliance success because it explains how firms develop strategies to effectively deploy resources (Sanchez, Heene, and Thomas 1996). In other words, competence-based theory provides the “bridge between resources and strategy” (Lewis and Gregory 1996:146). Thus, a *competence* is an organizational ability to deploy tangible and intangible entities in a way that helps a firm compete in its marketplace (Sanchez et al. 1996).

In addition, recent work argues that competences themselves may be considered as resources (Hamel and Prahalad 1994; Hunt 2000; Lowendahl and Haanes 1997). This research argues that a competence is (1) a form of resource because it is an intangible entity that firms use to compete in their marketplaces and (2) a higher order resource. Regarding the second point, *resource-advantage theory* (a resource-based theory of competition that incorporates competence-based theory) conceptualizes a competence as a *higher order* resource that is a distinct combination, or composite, of more basic *lower order* resources (Hunt 2000; Hunt and Morgan 1995, 1996, 1997). Resource-advantage theory’s central premise is that firms seek comparative advantages in resources in an effort to develop marketplace positions of competitive advantage and thereby achieve superior financial performance. For resource-advantage theory, the ability to *combine* lower order resources in a fashion that cannot be matched by competitors is a higher level resource that contributes to competitive advantage (Hunt 2000). For example, Sony’s “minaturization” competence is a synergistic higher order

FIGURE 1
An Alliance Competence Model of Resources and Alliance Success



NOTE: Observable indicators, factor loadings, and measurement and latent errors are not included for simplicity of depiction.

combination of tangible basic resources (e.g., specific machinery) and intangible basic resources (e.g., know-how) that allow Sony to compete more effectively (Hamel and Prahalad 1994).

For firms that wish to use alliances to achieve business goals, we argue that an important competence is an alliance competence. We conceptualize an *alliance* competence as an organizational ability for finding, developing, and managing alliances. Consistent with the competence-based theory and resource-advantage theory conceptualizations of a competence, an alliance competence should enhance the ability of firms to use alliances as a strategic option for pooling and deploying partner firms' basic resources to compete in their marketplace. As Day (1995) pointed out, firms having an alliance competence "have a deep base of experience that is woven into a core competency that enables them to outperform rivals in many aspects of alliance management" (p. 299). Examples of firms purported to have an alliance competence include Corning, Visa, and Hewlett Packard (Day 1995; Spekman, Isabella, and MacAvoy 1999; "Two Grandmasters" 1994).

AN ALLIANCE COMPETENCE MODEL OF RESOURCES AND ALLIANCE SUCCESS

Using resource-advantage theory, and thereby combining resource-based and competence-based views of alliance performance, we develop hypotheses that offer a

model of alliance success¹ (see Figure 1). In this model, an alliance competence is a key antecedent variable to alliance success because it not only directly affects alliance success but also indirectly affects alliance success through its effects on the acquisition of complementary resources and the creation of idiosyncratic resources. Because alliance competence is posited as a key antecedent variable, we label this model the "Alliance Competence Model of Resources and Alliance Success."

Resource Hypotheses

We posit that two specific types of resources affect alliance success: idiosyncratic and complementary resources. In terms of resource-advantage theory, complementary resources may be thought of as lower order resources that are "brought" to the alliance and idiosyncratic resources as the higher order resources that are "developed" by the alliance through the process of combining the complementary resources of the partner firms (Hunt 2000).

Idiosyncratic resources. We define alliance *idiosyncratic* resources as those that (1) are developed during the life of the alliance, (2) are unique to the alliance, and (3) facilitate the combining of the distinct lower order resources contributed by the partner firms (and, hence, are higher order resources). Idiosyncratic resources may be tangible, such as a joint manufacturing facility, or intangible, such as developing a highly efficient process for working to-

gether (Hunt 2000). Similarly, some researchers refer to idiosyncratic “investments” or “assets” (e.g., E. Anderson and Weitz 1992; Jap 1999; Williamson 1983, 1984). For example, E. Anderson and Weitz (1992) noted that alliance idiosyncratic investments include

training and/or dedicating personnel to servicing a specific manufacturer’s products, adopting a common order processing system, building specialized facilities to handle a specific manufacturer’s product line, and linking the manufacturer and distributor in the customer’s mind through promotions. (P. 20)

From a resource-advantage theory perspective, idiosyncratic resources make possible the integration of the partner firms’ individual resources, that is, allow alliances to extract the competitive advantage *potential* from the combination of the partner firms’ respective resources (Hunt 2000). From an RBV perspective, idiosyncratic resources, since they are unique to the alliance and are constantly evolving, help alliances maintain the durability and inimitability of their resource advantage (Dyer and Singh 1998; Jap 1999). Day (1995) discussed the idiosyncratic resource advantage achieved by many of Corning’s alliances:

Even if the competitors did understand the Corning recipe, they would still have to overcome what are called “time compression diseconomies.” Most capabilities can only be developed painstakingly over long periods of time. Rivals that try to rapidly achieve the same result through a “crash program” are likely to find they have incurred much higher costs than if they had made the same expenditures over a longer period, and they would probably still not achieve the same end result. (P. 299)

Hypothesis 1: The greater the degree to which resources in an alliance are idiosyncratic, the greater the degree of joint alliance success.

Complementary resources. We define complementary resources as the degree to which firms in an alliance are able to eliminate deficiencies in each other’s portfolio of resources (and, hence, enhance each other’s ability to achieve business goals) by supplying distinct capabilities, knowledge, and other entities. Although some refer to these resources as “complementary competencies” (e.g., Jap 1999), we use the broader term *resources* because, pursuant to RBV and resource-advantage theory, such entities as capabilities and knowledge are resources when they are used by a firm to compete in its marketplace (Hunt 2000; Hunt and Morgan 1995). Clearly, one of the reasons that firms enter into alliances is because they lack certain capabilities needed to be successful in a certain arena (Das and Teng 2000; Day 1995; Hunt 1997). Similarly, both Gummeson (1994, 1995) and Hunt (1997) posited that

firms’ portfolios, that is, their assortments (Alderson 1965), of relationships enable them to access the resources of other firms through alliances and gain a resource advantage. Varadarajan and Cunningham (1995) noted,

A firm entering into a strategic alliance may either seek partners whose abilities augment its strengths or ameliorate its weaknesses. . . . When firms [in an alliance] have complementary abilities, each partner can concentrate on the part of the value chain where it can make the greatest contribution. (Pp. 292, 293)

Resource-advantage theory suggests that the primary way that complementary resources lead to alliance competitive advantage is *indirect* in that they constitute the lower order or “basic” capabilities that must be combined via idiosyncratic resources into a system that cannot be matched by competitors (Hunt 1997; Hunt and Morgan 1995, 1996, 1997). For example, in airline alliances, although partner airlines may have complementary geographic capabilities, the ability of such alliances to be successful is based on the development of idiosyncratic systems that effectively integrate these geographic capabilities to provide passengers with seamless travel.

However, complementary resources *directly* affect the development of idiosyncratic resources because they motivate the development of higher order idiosyncratic resources that can be used to successfully combine and deploy the complementary resources pooled by the partner firms (Jap 1999). In other words, higher degrees of resource complementarity provide incentives for the alliance partners to invest more in the development of idiosyncratic resources because greater resource complementarity increases the likelihood that idiosyncratic investments will result in competitive advantages. Jap (1999) argued, complementary resources facilitate the development of idiosyncratic resources by encouraging the partner firms to “focus on potential strategic outcomes” (p. 465). In addition, because complementary resources represent the degree to which firms in an alliance are able to eliminate deficiencies in each other’s portfolio of resources, they contribute to the ability of an alliance to develop idiosyncratic resources that cannot be duplicated by competition (Hunt 1997; Hunt and Morgan 1995, 1996, 1997).

Hypothesis 2: The greater the degree to which resources in an alliance are complementary, the greater the degree to which resources in an alliance are idiosyncratic.

Alliance Competence Hypotheses

During the exploratory phase of our research, we conducted a review of the literature that examined the concept of alliance competence and conducted interviews with three academics and 32 practitioners who are

knowledgeable about alliances. Here, open-ended questions were asked about the concept of an alliance competence and its effects on alliance performance. From this initial research, we found that both academics and practicing managers believe that there is such an entity as an alliance competence; that is, some firms are simply better than other firms at finding, developing, and managing alliances. Second, to the probe “what are the components of alliance competence?” we found that informants use such phrases as “knowledge of how to manage alliances,” “experience with alliances,” “well-trained alliance managers,” “alert to new alliance opportunities,” and “ability to select good alliance partners.” Summarizing our informants’ responses, we posit that an alliance competence has three facets, which we label (1) alliance experience, (2) alliance manager development capability, and (3) partner identification propensity. Furthermore, consistent with competence-based theory and resource-advantage theory conceptualizations of a competence (a higher order resource that is a distinct combination of lower order resources), we propose that these three facets are the three lower order resources that collectively comprise the higher order resource of an alliance competence.² That is, more of *each* of these three lower order resources will contribute to increasing a firm’s competence in finding, developing, and managing alliances.

Alliance experience. Experience with alliances is a resource that can be leveraged across an organization because it contributes to knowledge about how to manage and use alliances (Simonin 1997). Thus, alliance experience is a lower order resource that facilitates an alliance competence. Day (1995) noted that such experience contributes to the quality of a firm’s “alliance management” by, among other things, improving their abilities with respect to “selecting and negotiating with potential partners” and “planning the mechanics of the alliance so that roles and responsibilities are clear cut” (p. 299). Although books and training programs exist, much of the knowledge about finding, developing, and managing alliances is “tacit” (Polanyi 1966), and firms must learn by doing (Anand and Khanna 2000; Day 1995; Spekman et al. 1999). Indeed, an alliance competence is such a hands-on learning experience that firms should expect some of their initial attempts at alliances to fail—and this will comprise part of the learning experience. Thus, firms’ initial attempts should be with relatively noncomplex and modest alliances, with attempts at more ambitious alliances awaiting the experience that builds over time (Lambe and Spekman 1997; Spekman et al. 1999).

Alliance manager development capability. Day (1995) and Spekman, Isabella, MacAvoy, and Forbes (1996) suggested that firms with an alliance competence have the ability to *develop* capable alliance managers. These managers then enable firms to plan and navigate the mechanics

of an alliance so that roles and responsibilities are clearly articulated and agreed upon. In addition, these managers have the ability to review continually the fit of the alliance to the changing environment to make modifications as necessary. Simonin (1997) stated, “The lower-than-average failure rate of joint ventures in the oil industry can be linked to the fact that managers have *learned* [italics added] the essentials of collaboration” (p. 1151). As a result, we argue, firms with competent alliance managers will negotiate, structure, and run alliances in ways that allow such firms to (1) secure attractive alliance partners, (2) minimize the chances of such alliance mismanagement as poor conflict resolution, and (3) work with their partner firms to successfully combine and synthesize their complementary resources over time into idiosyncratic resources that lead to competitive advantage.

Partner identification propensity. Firms that have an alliance competence systematically and proactively scan for and identify potential partners that have the complementary resources that are needed to “develop a relationship portfolio or ‘mix’ that complements existing competencies and enables them to occupy positions of competitive advantage” (Hunt 1997:440). Firms that can identify such partners not only enhance their ability to compete but also improve their chances of alliance success (Dyer and Singh 1998; Lambe, Spekman, and Hunt 2000; Simonin 1997; Sivadas and Dwyer 2000). In addition, Varadarajan and Cunningham (1995) and Day (1995) suggested that firms that scan for promising partners may also often achieve an alliance “first-mover” advantage that allows them to gain access to and preempt competition from scarce resources offered by potential alliance partners. Day (1995) argued that a “firm that is adept at identifying, consummating, and managing strategic alliances probably has a first mover advantage in bringing the best candidates into a relationship” (p. 299).

In summary, we conceptualize a *firm’s* alliance competence as an organizational ability for finding, developing, and managing alliances. This conceptualization is consistent with the definition of competence because an alliance competence is an organizational ability that helps a firm deploy interfirm entities in a way that helps the firm compete in its marketplace. Furthermore, this conceptualization is consistent with the resource-advantage view that a competence is a higher order resource that is a distinct combination of lower order resources. These lower order resources, we argue, comprise the three facets of an alliance competence: alliance experience, alliance manager development capability, and partner identification propensity.

In our research, we examine the effects of a *joint* alliance competence, which we conceptualize as the degree to which *both* partners have an organizational ability for finding, developing, and managing alliances. We theorize

that partners in an alliance where both partners have an alliance competence will work together more effectively than partners in an alliance in which only one (or none) of the alliance partners has an alliance competence. In other words, an unskilled alliance partner can diminish the ability of the alliance partners to work together and make necessary resource investments in the alliance to create alliance value. For example, a firm, even one with an alliance competence, will have difficulty working with an alliance partner that cannot manage interfirm cultural differences, has trouble coordinating activities with another firm, does not share control, does not easily share information, and fails to make necessary investments in the alliance (Sivadas and Dwyer 2000; Spekman et al. 1999).

In addition, although it might be argued that one competent alliance partner can have a positive effect on, or "train," the other, research indicates that the know-how required to be a competent alliance partner is complex and requires years of alliance experience (Anand and Khanna 2000; Day 1995; Lambe and Spekman 1997; Simonin 1997; Spekman et al. 1999). Thus, it is unlikely that a partner firm with little alliance competence will develop such a competence during the life of any particular alliance. We propose that when all of the firms in an alliance have an alliance competence, there is a synergistic benefit that enhances the ability of the alliance partners to work together to create alliance value.

Hypothesis 3: The greater the degree of joint alliance competence, the greater the degree of joint alliance success.

We also posit that an alliance competence should have a direct, positive effect on complementary resources because such a competence is a resource that exists *prior to the alliance* that helps firms *identify* and *secure* partner firms that have complementary resources on four grounds. First, organizational experience with alliances contributes to a firm's knowledge of how to successfully form and implement alliances (Simonin 1997; Spekman et al. 1999). Firms that have such experience will improve their ability to select, negotiate, and structure alliances so that they can secure alliance partners that have complementary resources (Day 1995; Spekman et al. 1999). Second, because an alliance competence implies that a firm produces capable alliance managers, it facilitates the ability of such firms to select and secure alliance partners that have complementary resources because alliance managers are often involved in initial negotiation and structuring of alliances (Spekman et al. 1999). Third, an alliance competence should have a positive effect on complementary resources because it enhances that ability of firms with such a competence to identify potential alliance partners with complementary resources (Dyer and Singh 1998; Simonin

1997; Sivadas and Dwyer 2000; Spekman et al. 1999). As noted by Hunt (1997), firms with an alliance competence

conduct periodically a strategic resource audit as a standard part of its corporate planning . . . [that] pay[s] close attention to the core competencies of the organization and the role that relationships with suppliers, customers, employees, and competitors can play in enhancing the total "mix" of strategic competencies. (P. 440)

Fourth, the partner identification propensity facet of alliance competence implies a "proactiveness," which provides firms with an *information advantage* that helps them gain access to complementary resources in situations where there is a scarcity of potential alliance partners who offer complementary resources (Lambe and Spekman 1997; Sarkar, Cavusgil, and Aulakh 1999; Sarkar, Echambadi, and Harrison 2001). Here (because of asymmetric information about alliance opportunities), firms with a partner identification propensity (i.e., who proactively scan for, and identify, promising alliance partners) facilitate their ability to partner *first* and hence gain access to scarce complementary resources because they often have better and earlier information than competition about potential alliance partners. Indeed, examples of such information advantage abound:

Swiss pharmaceutical companies (e.g., Roche, Ciba-Geigy, and Sandoz) appear to be gaining a significant advantage in biotechnology by partnering early with promising new biotechnology firms . . . these firms also have a high-level technology czar who manages a broad search for potential technology partners. These efforts appear to be paying off. About Sandoz, the managing general partner of a biotechnology venture-capital fund said, "They know about companies we're starting when they're just in the crystal ball." (Lambe and Spekman 1997:113)

Here, the information advantage generated by a firm's partner identification propensity may translate into a kind of first-mover resource advantage for the firm because it gains access to the *best* resources and/or preempts competition from the *only* complementary resources (Day 1995; Dyer and Singh 1998; Gomes-Casseres and Leonard-Barton 1994; Lambe and Spekman 1997; Varadarajan and Cunningham 1995). Such a first-mover resource advantage makes it difficult for competition to imitate the competitive advantage potential of the distinct partner resources pooled in the alliance and, thus, contributes to the degree to which such resources are complementary (or, again, the degree to which the resources pooled in the alliance enhance the ability of the firms to achieve their business goals).

Hypothesis 4: The greater the level of joint alliance competence, the greater the degree to which resources in an alliance are complementary.

In addition, an alliance competence should positively affect idiosyncratic resources because it helps firms *manage* an alliance in a way that allows the partner firms to successfully combine and synthesize their complementary resources over time to create idiosyncratic resources (Hunt 2000; Spekman et al. 1999). In terms of resource-advantage theory, an alliance competence is an organizational ability that facilitates the combining “of tangible and intangible basic [or complementary] resources” possessed by the alliance partners to create idiosyncratic resources that may be used to “efficiently/effectively produce valued market offerings” (Hunt 1997:439). Also, Day (1995) suggested that an alliance competence contributes to a firm’s ability to create idiosyncratic resources that cannot be matched by competition because of “causal ambiguity” (p. 299). This ambiguity, which contributes to the inimitability of the idiosyncratic resources, is maintained because “the essential skills and knowledge are embedded so deeply into the people, the tacit knowledge about alliances, the culture and the supporting processes that they cannot be directly observed.”

Hypothesis 5: The greater the level of joint alliance competence, the greater the degree to which resources in an alliance are idiosyncratic.

Senior management commitment. Although we posit that an alliance competence is a key antecedent variable of alliance success, we also hypothesize that the development of a firmwide alliance competence is strongly influenced by senior management’s commitment to the use of alliances. (*Joint* senior management commitment exists when the senior management of both of the firms in an alliance are committed to the use of alliances.) Because the strategic direction of organizations is driven by senior management, competences are developed or maintained only under the urging of senior management (Hamel and Prahalad 1994; Prabhu and Robson 2000; Sanchez et al. 1996). In similar fashion, Lado, Boyd, and Wright (1992) argued that competences are “consciously and systematically . . . developed by the willful choices and actions of the firm’s strategic leaders” (p. 78).

Thus, senior management commitment to use of alliances as a strategic alternative facilitates an alliance competence (Inkpen 1996; Sivadas and Dwyer 2000; Spekman et al. 1999). As Day (1995) argued, firms with an alliance competence exhibit “a non-wavering commitment to ongoing alliances” (p. 299). In the face of the inevitable ups and downs of an alliance, such a commitment is difficult without upper-management support. As to the importance of senior management commitment to the use of alliances,

Carl Pascarella, Visa’s CEO, stated, “We understand how to manage outside relationships. Everyone in this organization understands what it is like to work with a member of an alliance” (“Financial Services” 1995:2).

Hypothesis 6: The greater the level of joint senior management commitment to the use of alliances, the greater the level of joint alliance competence.

METHOD

Research Design

An ideal survey sample for research on alliance success would be a probability sample of the universe of all alliance managers. Unfortunately, no such sample exists for alliances, let alone for alliance *managers*. Thus, we used a procedure that (1) identified a sample of managers who, a priori, might cooperate and (2) prescreened them for alliance responsibilities. Specifically, we approached organizations that had midlevel and senior business managers who had attended executive programs, or had graduated from the MBA program, of a leading U.S. business school. A random sample of these managers was asked if they were involved with an alliance. They were also asked to provide the names of up to three colleagues (for up to three different alliances) who had such responsibilities. The resulting sample of 226 *distinct* alliances was then composed of (1) alliances for which the respondents stated that they had responsibility and (2) alliances for which respondents stated their colleagues had responsibility. Self-administered questionnaires were then mailed to the 226 *individuals identified as having responsibility for their distinct alliances*.

Cover letters sent with the questionnaires confirmed the respondent’s involvement with the alliance in question, stressed the importance of the research, stressed the importance of the respondent’s participation, and offered an incentive (an executive summary of the final results) for participating. To maximize response, we use the mail survey methods suggested by Dillman (1978). One week after the initial mailing, we mailed follow-up letters to encourage a response. Three weeks after the initial mailing, all remaining nonrespondents were sent a second follow-up letter, plus a replacement questionnaire. A total of 195 were returned, a response rate of 86 percent.

The respondents in this survey act as key informants. Because the task of key informants is complex, they should be chosen based on important qualifications they might possess, such as specific responsibilities and special knowledge (Phillips 1981). Both the initial screening and the cover letter that accompanied the questionnaire were designed to ensure that key informants were knowledgeable about the alliance on which they reported. As Phillips

(1981) suggested, we eliminated respondents who were not knowledgeable about the alliance on which they were reporting. Respondents rated themselves on a 7-point Likert-type scale, where 1 was *not very knowledgeable* about the alliance and 7 was *very knowledgeable* about the alliance. All respondents who rated themselves less than 5 were dropped. This procedure reduced the sample to 187 alliance managers, each involved in a separate and distinct alliance. The average knowledge level about the alliance on which they report for the remaining 187 alliance manager respondents is 6.5, a very high score for research using informants (Phillips 1981).

The sample was refined further by eliminating alliances that had not been in existence for at least 1 year. Evidence suggests that respondents should be able to observe “considerable variation in outcomes” within a year (Jap 1999:467). Thus, by using only alliances that were at least 1 year old, we further assured the likelihood of a knowledgeable respondent. This procedure left a sample of 152 alliances, the average age of which is 6.2 years.

Finally, we performed a listwise deletion of alliances that had missing values for any of the variables in the proposed model. This eliminated 7 additional alliances, resulting in an analysis sample of 145 alliance managers from 71 companies (representing 145 separate and distinct alliances). Of the 145 managers, 122 of the respondents considered themselves as “the” person responsible for the alliance, and the remaining 23 were either part of the alliance team or supervised the person responsible for the alliance.

Sample characteristics. The sampling method provided a sample that varies greatly in alliance characteristics. Informants’ alliances vary widely in age (13.8% are 1 to 2 years old, 24.8% are 2 to 3 years old, 15.9% are 3 to 4 years old, 9.0% are 4 to 5 years old, 5.5% are 5 to 6 years old, 4.1% are 6 to 7 years old, 26.9% are 7 to 50 years old), functional scope (8.3% exchange of know-how/technology, 0.7% joint exploration/development of raw materials, 3.4% joint R&D, 33.8% strategic purchasing, 9.7% joint product/service development, 8.3% joint manufacturing, 5.5% joint marketing, 11.0% manufacturing/marketing, 8.3% manufacturing/distribution, 11.0% other), and whether they are domestic or cross-border (31.3% are cross-border and 68.7% are U.S. domestic).

The alliances surveyed vary in primary functional scope, represent both horizontal (e.g., joint manufacturing) and vertical (e.g., manufacturer-distributor) alliances, are from a broad cross section of industries, and are both domestic and international in nature. Although a sample from such a heterogeneous population of alliances may increase the chances of extraneous sources of variation, we argue that the diverse nature of our sample is useful because we posit that alliance competence is a key antecedent variable for success in *all* types of—not just specific kinds of—

alliances. In other words, all forms of alliances should evidence similar mechanisms for success: an alliance competence and specific resource advantages (Day 1995; Varadarajan and Cunningham 1995).

Unit of analysis. The sample consists of two-firm alliances. Indeed, both the screening procedure and the questionnaire cover letter made it clear that the alliances of concern in this research were alliances between only two firms. Thus, although the measures used were designed to examine perceptions of the dyad, the data were collected from one partner’s viewpoint.³ The use of an informant “speaking” on behalf of the partnership and answering questions on dyadic issues and conditions is sometimes referred to as a “proxy-report” (Menon, Bickart, Sudman, and Blair 1995:77). Empirical and theoretical support exists for the use of proxy reports when there is joint participation in an event—such as there is in alliances (Menon et al. 1995). In addition, although researchers widely recognize the value of gathering data from both sides of the firm dyad (because of the confirmation of perceptions and the validity testing such data permit), the difficulties associated with gathering and using such data are so great that most studies that involve firm dyads use proxy-reports (E. Anderson and Weitz 1992; Buchanan 1992; Jap 1999; Kaufmann and Dant 1992; Noordewier, John, and Nevin 1990).

Measures

Pretest. We began our measurement development with 27 items (see appendix), 12 of which were modifications of extant measures that had been tested in other research (idiosyncratic resources, complementary resources, and alliance success) and 15 for the new measures of senior management commitment and alliance competence. The initial items for senior management commitment and alliance competence were generated from (1) construct definitions, (2) literature that represents the domain of each facet of the variable, (3) interviews with 32 practicing managers who are knowledgeable about alliances, and (4) interviews with three academics who have theorized and conducted research on alliances. During the process of developing the new measures for senior management commitment and joint alliance competence, we sought items that would tap the domains of the constructs (Churchill 1979).

Significant development and refinement of our measures occurred during the pretest, which used the “substantive validity” testing procedure of J. C. Anderson and Gerbing (1991). This procedure has experts or individuals of interest match items to the constructs they are supposed to measure. Item validity is then inferred from the accuracy with which items are judged to match the construct definition. Thirty-two midlevel and senior managers

attending executive programs at a leading U.S. school of business and enrolled in executive courses that focus on topics (channels, sales, alliance management) germane to alliances were used as respondents in this pretest process.⁴ All participants were familiar with the concept of alliances, and most had experience managing or being part of an alliance.

Consistent with J. C. Anderson and Gerbing's (1991) approach, executives in the pretest were asked to match prospective items to their appropriate construct. Items that were often mismatched were either eliminated or refined. Statistically significant values ($p < .05$) of the substantive validity coefficient indicate that the construct is sufficiently well designed and that research participants were able to assign the measures to their intended construct (J. C. Anderson and Gerbing 1991). This heuristic was used as a guide in the process of deciding which items to retain. Substantive validity testing was used to test both the newly developed alliance competence measure and the modified extant measures that had been tested in other research (complementary resources, idiosyncratic resources, and alliance success). The substantive validity pretest procedure resulted in a total of five items being removed from the senior management commitment, alliance competence, and idiosyncratic resource measures.

Characteristics of measures. The analysis required measures for five constructs: complementary resources, idiosyncratic resources, joint alliance success, joint senior management commitment, and joint alliance competence. *Complementary resources* is a reflective measure composed of a three-item scale that is a modified version of the Complementary Competencies of the Dyad scale used by Jap (1999). The first modification changed the language of item wording from *they* and *their* to *we* and *our* because our pretests indicated that *we* and *our* are more evocative for an informant reporting on his or her alliance dyad.⁵ For example, "They have complementary strengths that are useful to their relationship" was changed to "We have complementary strengths that are useful to our relationship." Second, because we ground our research in RBV and resource-advantage theory and to be consistent with our definition that complementary resources enhance the ability of the firms to achieve their goals, we modified "They contribute different capabilities to the relationship" to "We both contribute different resources to the relationship that help us achieve mutual goals." The resulting measure, scored on a 7-point scale ranging from *strongly disagree* to *strongly agree*, taps the degree to which the partners enhance their ability to achieve business goals by pooling their distinct capabilities.

Idiosyncratic resources is a reflective measure composed of a four-item scale that has both items that are modified versions of the items used by Jap (1999) and other items that are similar to the items used by E. Anderson and

Weitz (1992). We started with a pool of six items, two of which did not pass the substantive validity pretest. It is interesting to note that the two items ("wasting a lot of knowledge" and "lose a lot of investments") that did not pass the substantive validity pretest are different from the remaining items in that they refer to termination costs, a concept that is central to transaction cost analysis, but not resource-based theories. Again, we made the pronoun changes discussed earlier for complementary resources. The measure, scored on a 7-point scale ranging from *not true at all* to *very true*, captures the degree to which the partners have developed over time assets and/or capabilities that are specific to the alliance and enhance the alliance's competitive efforts.

Alliances can be successful in multiple ways. For example, alliances can be evaluated on the degree to which they achieve strategic objectives, result in the achievement of competitive advantages, and/or result in profits for the partner firms. We use joint profits as our indicator of alliance success because it can be argued that profitability implies that strategic objectives and competitive advantages were achieved (Jap 1999). Therefore, *joint alliance success* is a reflective measure composed of a three-item scale that is a modified version of the Profit Performance scale used by Jap (1995, 1999). The only modifications were the pronoun changes discussed earlier. The measure, scored on a 7-point scale ranging from *not at all true* to *very true*, captures the degree to which both partners have generated a high level of profits as a result of the alliance.

Joint senior management commitment is a new measure that was initially a four-item scale, but one item was eliminated during the pretest and one item was eliminated during the measurement model analysis. Thus, the final measure is a two-item scale. The measure, scored on a 7-point scale ranging from *strongly disagree* to *strongly agree*, taps the degree to which senior management in both of the partner firms supports the use of alliances to achieve business objectives.

Joint alliance competence is a composite that requires a formative measure because we conceptualize alliance competence as a higher order resource that increases in magnitude as each of the three basic alliance competence resources increases (Diamantopoulos and Winklhofer 2001; Howell 1987). That is, alliance competence is not an entity that *causes* the three basic resources. Rather, the three resources contribute to the entity that we label as "alliance competence." Thus, joint alliance competence is measured as the overall mean score of the three basic resources, each of the items of which are scored on a 7-point scale ranging from *strongly disagree* to *strongly agree*. Three items belong to *alliance experience*, which is a reflective measure that captures the degree to which the partners have participated in alliances in the past. Three items belong to *alliance manager development capability*, which is a reflective measure that taps the extent to which

the partners can develop managers to successfully run alliances. And, three items belong to *partner identification propensity*, which is a reflective measure that captures the extent to which the partner firms actively search for companies that they can ally with to gain competitive advantage.

All measures were analyzed for reliability and validity following the guidelines suggested by J. C. Anderson and Gerbing (1988) and Jöreskog and Sörbom (1993). Confirmatory factor analysis was used to estimate a measurement model composed of the four nonalliance competence variables and the three components of alliance competence (alliance experience, alliance manager development capability, and partner identification propensity) using maximum likelihood in LISREL 8.30. In the model, all of the variables and the three components of alliance competence were treated as separate reflective measures. Overall, the resulting fit indexes indicate that the measurement model fits the data well: $\chi^2 = 222.76$ (166 degrees of freedom), $p < .00$, comparative fit index (CFI) = .97, root mean square error of approximation (RMSEA) = .045, and Goodness-of-Fit Index (GFI) = .88.⁶ Also, the ranges of all of the factor loadings and the measurement errors are acceptable and significant at $\alpha = .01$, which provides evidence of convergent validity. In addition, evidence of discriminant validity was attained by using the procedure recommended by Fornell and Larcker (1981). Every pair of constructs passed this test. The appendix reports the retained items, reliability information for the reflective scales with more than two items, and items deleted during the pretest and the measurement model analysis.

RESULTS

Descriptive Statistics

Table 1 shows the descriptive statistics and the correlation matrix for the five research variables. The variable means are all below 6, with two being below 5 ($M = 5.05$). The standard deviations for the variables range from .85 to 1.59 ($M = 1.17$), indicating a substantial amount of variance in the responses. The correlations in Table 1 provide an initial test of the six hypotheses. All six of the hypotheses are supported at the $p < .01$ level. The values of the correlations range from .23 to .50, with the mean being .34.

Testing the Proposed Model

The structural model. Using maximum likelihood in LISREL 8.30 to perform structural equation modeling, we estimate the proposed structural model illustrated in Figure 1 and report the results in Table 2. All of the hypothesized paths are significant ($p < .01$). The proposed

TABLE 1
Means, Standard Deviations,
and Correlation Matrix

Variable	M	SD	CR	IR	JAS	JAC	JSMC
CR	5.86	0.85	1				
IR	5.10	1.19	.38**	1			
JAS	4.58	1.59	.30**	.50**	1		
JAC	4.15	1.07	.23**	.24**	.32**	1	
JSMC	5.57	1.14	.28**	.39**	.37**	.42**	1

NOTE: CR = complementary resources; IR = idiosyncratic resources; JAS = joint alliance success; JAC = joint alliance competence; JSMC = joint senior management commitment.

** Correlation is significant at the .01 level.

TABLE 2
Proposed Structural Model Estimation Results

Hypothesis	Path	Effect Estimate
Hypothesis 1	IR → JAS	.37**
Hypothesis 2	CR → IR	.28**
Hypothesis 3	JAC → JAS	.35**
Hypothesis 4	JAC → CR	.44**
Hypothesis 5	JAC → IR	.45**
Hypothesis 6	JSMC → JAC	.84**

$\chi^2 = 77.10$ (59 *df*), $p < .057$

CFI = .98

GFI = .93

IFI = .98

PNFI = .70

RMSEA = .043

$SMC_{JAS} = .40$, $SMC_{IR} = .39$, $SMC_{CR} = .20$, $SMC_{JAC} = .71$

NOTE: All estimates are common metric and completely standardized. JAS = joint alliance success; IR = idiosyncratic resources; CR = complementary resources; JAC = joint alliance competence; JSMC = joint senior management commitment; CFI = Comparative Fit Index; GFI = Goodness-of-Fit Index; IFI = Incremental Fit Index; PNFI = Parsimonious Normed Fit Index; RMSEA = root mean square error of approximation.

** $\alpha = .01$.

structural model's CFI (Bentler 1990) of .98, GFI of .93, chi-square of 77.10 ($p .057$), with 59 degrees of freedom, and RMSEA of .043 indicate a good fit. The squared multiple correlations (SMCs) for the endogenous variables are all high: $SMC_{JAS} = .40$, $SMC_{IR} = .39$, $SMC_{CR} = .20$, $SMC_{JAC} = .71$. Overall, our proposed structural model performs well.

Hypotheses results. Table 2 lists the results for the hypotheses. All of the hypotheses are supported. Idiosyncratic resources have a significant positive effect ($\beta_1 = .37$, $p < .01$) on joint alliance success, supporting Hypothesis 1. Complementary resources have a significant positive effect ($\beta_2 = .28$, $p < .01$) on idiosyncratic resources, supporting Hypothesis 2. Joint alliance competence has a significant positive effect ($\beta_3 = .35$, $p < .01$) on joint alliance success, supporting Hypothesis 3. Joint alliance competence also has a significant positive effect ($\beta_4 = .44$, $p < .01$) on joint alliance success, supporting Hypothesis 4.

TABLE 3
Rival Models 1, 2, 3, 4—Structural Model Estimation Results

<i>Rival Model 1</i> <i>Complementary Resources</i> <i>With a Direct Path to</i> <i>Joint Alliance Success</i>		<i>Rival Model 2</i> <i>Joint Alliance Competence</i> <i>With Only a Direct Path to</i> <i>Joint Alliance Success</i>		<i>Rival Model 3</i> <i>Joint Senior Management Commitment</i> <i>With Direct Paths to Idiosyncratic</i> <i>Resources and Joint Alliance Success</i>		<i>Rival Model 4</i> <i>Joint Alliance Competence</i> <i>Treated as a</i> <i>Second-Order Factor</i>	
<i>Path</i>	<i>Effect Estimate</i>	<i>Path</i>	<i>Effect Estimate</i>	<i>Path</i>	<i>Effect Estimate</i>	<i>Path</i>	<i>Effect Estimate</i>
IR → JAS	.34**	IR → JAS	.49**	IR → JAS	.44**	IR → JAS	.50**
CR → IR	.28**	CR → IR	.53**	CR → IR	.35**	CR → IR	.41**
CR → JAS	.08	JAC → JAS	.36**	JAC → JAS	.56	JAC → JAS	.26**
JAC → JAS	.31**	JSMC → JAC	.72**	JAC → CR	.44**	JAC → CR	.37*
JAC → CR	.42**			JAC → IR	-.10	JAC → IR	.20**
JAC → IR	.45**			JSMC → JAC	.80**	JSMC → JAC	.63**
JSMC → JAC	.85**			JSMC → IR	.48		
				JSMC → JAS	-.22		
$\chi^2 = 76.51$ (58 <i>df</i>), $p < .052$		$\chi^2 = 124.40$ (62 <i>df</i>), $p < .00$		$\chi^2 = 74.39$ (57 <i>df</i>), $p < .061$		$\chi^2 = 261.35$ (178 <i>df</i>), $p < 0.0$	
CFI = .98		CFI = .93		CFI = .98		CFI = .95	
GFI = .93		GFI = .89		GFI = .93		GFI = .85	
IFI = .98		IFI = .93		IFI = .98		IFI = .95	
PNFI = .69		PNFI = .69		PNFI = .68		PNFI = .73	
RMSEA = .044		RMSEA = .071		RMSEA = .043		RMSEA = .056	
SMC _{JAS} = .39, SMC _{IR} = .39		SMC _{JAS} = .37		SMC _{JAS} = .46, SMC _{IR} = .37		SMC _{JAS} = .41, SMC _{IR} = .27	
SMC _{CR} = .18, SMC _{JAC} = .73		SMC _{IR} = .28		SMC _{CR} = .19, SMC _{JAC} = .64		SMC _{CR} = .14, SMC _{JAC} = .40	
		SMC _{JAC} = .52					

NOTE: All estimates are common metric and completely standardized. JAS = joint alliance success; IR = idiosyncratic resources; CR = complementary resources; JAC = joint alliance competence; JSMC = joint senior management commitment; CFI = Comparative Fit Index; GFI = Goodness-of-Fit Index; IFI = Incremental Fit Index; PNFI = Parsimonious Normed Fit Index; RMSEA = root mean square error of approximation.

* $\alpha = .05$. ** $\alpha = .01$.

.01) on complementary resources, supporting Hypothesis 4. In addition, joint alliance competence has a significant positive effect ($\beta_5 = .45$, $p < .01$) on idiosyncratic resources, supporting Hypothesis 5. Finally, joint senior management commitment has a significant positive effect ($\beta_6 = .84$, $p < .01$) on joint alliance competence, supporting Hypothesis 6.

Rival models. We use theory to develop our alliance competence model of alliance success, and our empirical test of the model further supports the model. However, one might argue that (1) complementary resources, in addition to indirectly contributing to joint alliance success by leading to the development of idiosyncratic resources, has a direct effect on joint alliance success; (2) joint alliance competence is not antecedent to the resources necessary for joint alliance success; (3) joint senior management commitment not only has a direct effect on alliance competence but also on both idiosyncratic resources and joint alliance success; and/or (4) a better measure of joint alliance competence might be a higher order factor that is a reflective (instead of a formative) measure of the three facets. Thus, we use maximum likelihood estimation in LISREL 8.30 to test four rival models. We then compare these results with the results of our proposed model.

The first argument is that complementary resources, in addition to indirectly contributing to joint alliance success

by leading to the development of idiosyncratic resources, has a direct effect on joint alliance success. To test this model, labeled Rival Model 1, we added a direct path from complementary resources to joint alliance success to our proposed model. Table 3 reports key fit indexes, SMCs of the endogenous variables, and standardized path coefficient estimates. The fit indexes for Rival Model 1, although acceptable, are not as good as those for the proposed model. Most important, however, the direct path from complementary resources to joint alliance success is not significant. This result suggests that although there is a positive correlation between complementary resources and joint alliance success, there is no direct path between them when other constructs are added. And, as discussed earlier, this result can be explained by resource-advantage theory, which suggests that complementary resources do not directly lead to alliance competitive advantage but only indirectly because they constitute the lower order or “basic” capabilities that must be combined via idiosyncratic resources into a system that cannot be matched by competitors (Hunt 2000). Also, these results replicate Jap’s (1999) empirical finding that complementary resources affect alliance success only indirectly and affect alliance success indirectly through idiosyncratic resources.

The second argument is that joint alliance competence is not antecedent to the complementary and idiosyncratic

resources necessary for joint alliance success. To test this model, labeled Rival Model 2, we eliminate the paths from joint alliance competence to complementary resources and idiosyncratic resources. As a result, complementary resources become an exogenous variable. Table 3 reports key fit indices, SMCs of the endogenous variables, and standardized path coefficient estimates. The fit indexes for Rival Model 2 are not as good as those for the proposed model and, indeed, by some standards indicate poor fit. CFI drops from .98 to .93, GFI drops from .93 to .89, the Incremental Fit Index (IFI) drops from .98 to .93, the Parsimony Normed Fit Index (PNFI) drops from .70 to .69, and RMSEA increases from .043 to .071. Also, Rival Model 2 explains less of the endogenous variables' variance.

The third argument is that joint senior management commitment has a direct effect on both idiosyncratic resources and joint alliance success. To test this model, labeled Rival Model 3, we add direct paths from joint senior management commitment to idiosyncratic resources and joint alliance success. Table 3 reports key fit indexes, SMCs of the endogenous variables, and standardized path coefficient estimates. The fit indexes for Rival Model 3 are not as good as those for the proposed model because PNFI drops from .70 to .68. In addition, Rival Model 3, with the exception of the SMC for joint alliance success, explains less of the endogenous variables' variance. Most important, however, the direct paths from joint senior management commitment to idiosyncratic resources and from joint senior management commitment to joint alliance success are not significant. This result suggests that even though joint senior management commitment is positively correlated with idiosyncratic resources and joint alliance success, there is no direct path between joint senior management commitment and these variables when joint alliance competence is in the model. Indeed, adding the two nonsignificant paths (joint senior management commitment to idiosyncratic resources and joint senior management commitment to joint alliance success) resulted in two paths that were previously significant becoming nonsignificant (joint alliance competence to idiosyncratic resources and joint alliance competence to joint alliance success).

The fourth argument is that an alliance competence is a second-order factor that causes the three resources, rather than it being a *composite* of its three resources. To test this model, labeled Rival Model 4, we model alliance competence as a second-order factor. Table 3 reports key fit indexes, SMCs of the endogenous variables, and standardized path coefficient estimates. The fit indexes for Rival Model 4, although acceptable, are not as good as those for the proposed model. Indeed, GFI drops from .93 to .85, and RMSEA increases from .043 to .056. Also, with the exception of SMC for joint alliance success, Rival Model 4 explains less of the endogenous variables' variance. Thus, although treating alliance competence as a higher order

factor provides acceptable fit, the proposed structural model is superior.

DISCUSSION

This study examines a key antecedent, alliance competence, that is hypothesized to promote the acquisition and creation of resources that are necessary for alliance success and alliance success itself. To this end, a measure of alliance competence was developed and tested within a nomological network for its effect on complementary resources, idiosyncratic resources, and alliance success. Also, the model tested the effect of senior management commitment to the use of alliances on the development of an alliance competence. Our findings provide strong support for the main thesis of our research and valuable insights about the predictors of alliance success. First, the hypothesized structural relationships explain 40 percent of the variance in alliance success, which compares favorably to prior studies in different contexts (especially considering that we did not include relational variables that the relationship marketing literature also posits are antecedents of alliance success). Second, alliance competence is shown to have a significant effect on not only complementary and idiosyncratic resources but also a direct effect on alliance success. Third, senior management commitment to the use of alliances has a strong effect on the development of an alliance competence, explaining 71 percent of its variance.

Also, not only do our results support the view that complementary and idiosyncratic resources affect alliance success, but they also indicate that (1) complementary resources have only an indirect effect on alliance success through idiosyncratic resources, and (2) an alliance competence also has an indirect effect on alliance success through idiosyncratic resources. These findings suggest that idiosyncratic resources are a *key mediating variable* that influences alliance outcomes.

In addition, we show that an alliance competence is a *key antecedent* to complementary resources, idiosyncratic resources, and alliance success, which supports the resource-based and competence-based views of the firm and resource-advantage theory. An alliance competence allows firms to acquire and combine their more basic resource advantages in a fashion that contributes to alliance success. This is an important finding that should assist firms that wish to better understand the drivers of alliance success. In addition, identifying an alliance competence as a key antecedent of alliance success is critical to the study of alliances because it contributes to a more complete explanation of alliance performance.

Managerially, our findings on alliance competence are consistent with much of the findings of practitioner-oriented research and support the current business

emphasis on competences as resources. For years, firms have recognized that an alliance competence contributes to alliance success, yet rigorous empirical support has been lacking. Our research empirically supports the view that alliance competence contributes to alliance success. Indeed, in a time when firms are increasingly dependent on other firms or “networks” for the final state of their marketing mix, our research suggests that an alliance competence may be a critically important component of business success.

Also, our research suggests how firms might go about developing an alliance competence. Essentially, firms that wish to enhance their alliance capabilities should develop a knowledge and skill infrastructure that facilitates an alliance competence. Since much of the essential knowledge about finding, developing, and managing alliances is tacit, that is, must be learned by doing, we suggest that firms engage in alliances as a way to learn how to do alliances (Anand and Khanna 2000; Day 1995; Spekman et al. 1999). For example, a business development manager at Hewlett-Packard says that for each alliance, “we hold a postmortem with all the involved (HP) parties. We look at the original objectives, the implementation, what went right what went wrong” (“Two Grandmasters” 1994:2). This information goes into a written management briefing, which later goes into an alliance database. Here, Hewlett-Packard uses its particular alliance experiences to create a knowledge resource that helps the entire organization to better use alliances.

In addition, since the development of an alliance competence often requires “investments” made in early “learning” alliances, the support of senior management is *critical* because many of these early alliances may appear, on paper, as failures. Also, senior management commitment to the use of alliances as a strategic option improves a firm’s ability to secure alliance partners that will facilitate alliance success. As noted by Sivadas and Dwyer (2000), “Top management support is reflected, for example, in the creation of a position called Director of Strategic Alliances at several *Fortune* 100 companies, whose job it is to identify and evaluate alliance potentialities and possibilities” (p. 35). And, top management support is critical to ensure that potential alliance managers receive the kind of training and experience that they need to become capable alliance managers. Tom MacAvoy, former chief operating officer and vice chairman of Corning, a firm considered by many to have a well-developed alliance competence (Day 1995), describes Corning’s senior management commitment to the development of its alliance managers (“The Ever Evolving Alliance Manager” 1995):

At Corning, there has long been a realization that alliances are both incredibly important to the company and pervasive throughout it. As a result, Corning needs a lot of people who are good at managing

these things. Senior management, who has historically been responsible for staffing alliances, certainly knows this. Young, high-potential managers are often rotated into a joint venture very early in their career. At first, they are likely to be in a support role, learning the special dynamics of collaboration. If they prove themselves there, then they might get a little joint venture to run themselves. And, if they continue to prove themselves, they could become the alliance manager representing Corning’s interests on a billion dollar alliance like Siecor, the joint venture with Siemens. (P. 2)

Limitations and Suggestions for Future Research

Several research limitations should be recognized to provide a balanced discussion of our findings. First, the model does not allow one to assess how the actions of the firms on their own might affect the alliance. For example, what would happen if one firm had a well-developed alliance competence and the other firm had little alliance competence? Would the high degree of alliance competence for one firm compensate for the low degree of competence for the other? Questions such as these can best be answered by dyadic data.

Second, although the respondent selection process ensured highly knowledgeable respondents and research supports the use of proxy-reports, we might have been able to improve the accuracy of our data by having a respondent from each firm report on the alliance rather than having one individual report on the alliance. This limitation, however, needs to be balanced against the difficulty of combining the responses of two informants in dyadic fashion (Jap 1999; Jap and Ganesan 2000). Sivadas and Dwyer (2000) noted that although their alliance research “would have yielded richer insights and provided a more complete and balanced picture” if they had used more than one alliance respondent per alliance, “talking to both partners” would have provided a “logistical challenge” (p. 45). Also, informant anonymity prevented contacting alliance partners. Regardless, with or without dyadic data, future research should explore alliances with asymmetries in partner firm alliance competence to determine if such asymmetries affect alliance outcomes and/or if there are variables that moderate the effect of partner firm alliance competence asymmetries on alliance outcomes.

Third, longitudinal data would have been useful to determine whether the effect of the variables in question was “a short-term, ephemeral . . . [effect] or an enduring process over time” (Jap 1999:469). Also, longitudinal data might have been useful to examine how changes in certain variables affect alliance success over time. However, there has been a more recent recognition that the potential *reliability* shortcomings of longitudinal data may cause flawed results and, therefore, researchers such as Jap and

Ganesan (2000) used data gathered at one point in time. Reliable longitudinal data, argued J. C. Anderson (1995), may be a chimera:

First, consider the mechanics of such an undertaking. An enormous amount of sustained cooperation is required by managers acting as key informants over time. The “right-sizing” movement, which appears to be continuing despite warnings about its potential shortcomings (Hamel and Prahalad 1994), produces tremendous upheaval in firms and increasing demands on the remaining managers. The first consequence leads to sample attrition over time as whole units disappear, whereas the second leads to greater unwillingness to participate in academic research, particularly repeatedly. (P. 349)

Fourth, our research did not examine the effect of an alliance competence on *relationship variables*, such as trust, commitment, communication, and relational norms. Our research theorized that one of the reasons that an alliance competence contributes to the development of idiosyncratic resources is because it facilitates a good working relationship between the alliance partners. Such a relationship may be considered as a relational resource and has been referred to in the alliance literature as “social capital” (Ahuja 2000; Coleman 1988, 1990; Hunt 2000; Kogut 2000), “relational capital” (Kale, Singh, and Perlmutter 2000), and “relationship capital” (Sarkar, Echambadi, Harrison, Cavusgil, and Aulakh 2001). Such capital facilitates “collective action,” which in turn helps the firms in an alliance to share and use their respective resources to achieve alliance success (Coleman 1990; Hunt 2000; Kogut 2000; Sarkar, Echambadi, Harrison, Cavusgil, and Aulakh 2001). A future study should examine the effect of an alliance competence on relationship resources (e.g., trust and commitment) and the effect of such resources on complementary and idiosyncratic resources. We would expect a positive relationship between joint alliance competence and relationship resources because an alliance competence provides firms with an enhanced ability to identify alliance partners with which they can develop relationship resources and manage the alliance so that such resources are developed.

Fifth, because our research is an early examination of the construct of alliance competence, future research might explore the possibility of additional facets that might contribute to alliance competence. For example, a firm’s ability to learn how to form and manage alliances from its alliance experiences is a factor that should be examined by future research as a potential facet of alliance competence (e.g., Anand and Khanna 2000; Simonin 1997). Research questions here include, What types of learning are most relevant for developing an alliance competence? and What alliance management skills are most pivotal to alliance success? Research has shown that experiential learning is

a key to developing an alliance competence, but more questions remain, such as Can the experiential learning process be shortened? Is there value to nonexperiential learning? and What factors contribute to effective experiential learning? Another learning factor that future research should examine as a potential facet of alliance competence is the ability of the firm to learn (nonopportunistically, we would argue) “know-how and capabilities” from their alliance partner (e.g., Kale et al. 2000). And, in related fashion, a firm’s ability to protect itself from knowledge expropriation and opportunistic behavior would merit investigation as a potential facet of alliance competence (e.g., Kale et al. 2000).

Sixth, although we used profits as our indicator of alliance success because it can be argued that it subsumes other measures of alliance success (such as the achievement of strategic objectives and competitive advantages), there are alliances that are considered successful that fail to achieve profitability. Also, other nonprofit measures add richness to the measure of alliance success. For example, as has been discussed, knowledge gained from alliances is often considered a measure of alliance success. Here, firms who are attempting to develop an alliance competence consider experientially derived knowledge about finding, developing, and managing alliances as a positive alliance outcome (Anand and Khanna 2000; Day 1995; Spekman et al. 1999). Also, firms often consider knowledge gained from their alliance partner(s) as a positive alliance outcome (Dyer and Singh 1998; Kale et al. 2000). Thus, future research should examine the effect of an alliance competence on both nonprofit and profit measures of alliance success.

Seventh, although theory and the heterogeneous nature of our sample lends support to the generalizability of our results, there may be significant differences that might have *attenuated* our results. Had we used a sample that was more homogeneous, perhaps we would have reduced the variance noise, which might have resulted in more explained variance. One significant potential cause of attenuation involves the limitation discussed above: alliances may have different measures of success. Thus, some of the alliances in the sample may have had objectives other than (or in addition to) profit and, hence, would have reduced the variance we explained and the significance of the results that involved the outcome variable of joint alliance success. Future research should comparatively examine different forms of alliances to determine if they benefit from different elements of an alliance competence and how an alliance competence affects different forms of alliances on various measures of alliance success.

Eighth, our research shares a problem with such recent marketing works as Singh (2000); Sivadas and Dwyer (2000); Sethi (2000); Jap and Ganesan (2000); Cannon and Perreault (1999); Chandy and Tellis (1998); Kohli,

Shervani, and Challagalla (1998); Moorman and Miner (1997); and such management works as Simonin (1997), Scott and Bruce (1994), and Konrad and Linnehan (1995). The common problem is that data on a key dependent variable (e.g., joint alliance success) come from the same source as the data on important independent variables (e.g., joint alliance competence). Although data on alliance success from corporate records or another informant would have been desirable, four factors prevented gathering such data: (1) unless an alliance is a publicly held joint venture, publicly accessible profit and loss data do not exist ("The Trauma" 1995); (2) if profit figures are not publicly available, most firms will not release such figures; (3) informant anonymity prevented contacting alliance partners; and (4) objective measures of alliance success may not exist ("The Trauma" 1995). Accenture noted (Kalmbach and Roussel 1999),

Indeed, our data show that only 51 percent of alliances use formal performance measures, and of those that do, just 20 percent of executives involved believe the measures to be sufficient. All told, barely 10 percent of alliances have meaningful measures of performance. (P. 28)

As to the likelihood of same-source bias in research in general, Crampton and Wagner (1994) examined 581 published articles and concluded that "percept-percept inflation may be more the exception than the rule in microresearch on organizations" (p. 72). Also, Singh (2000) argued,

On the basis of several studies and meta-analysis of . . . [self-report] biases, it is reasonable to state that performance self-reports are more likely to bias the mean values (upward) but less likely to bias their correlations with other constructs. . . . Also, evidence is accumulating that these biases are substantially reduced and that the validity of self-report performance is enhanced by using anonymous mail surveys (an approach used here), because motivation for self-presentation is curtailed. Third, it is possible that the explained variances are increased by common method variance that creeps into cross-sectional research. However, it is less likely that the differential pattern of results obtained is largely attributable to common method variance, because this variance tends to obfuscate differential relationships. (P. 31)

Nonetheless, as a check of common method bias, we conduct an analysis suggested by Podsakoff and Organ (1986) to explore the degree to which the results may have been affected by common method variance. In the test, one conducts a confirmatory factor analysis of a model positing that a single factor underlies the relationships between the study variables. The logic of this one-factor test is that a

single *method factor* should account for a substantial portion of the common variance across the study variables if common method bias is weighty. When we conduct the test, the model does not fit well (RMSEA = .18, CFI = .71, GFI = .71), which suggests tentatively that common method bias alone does not explain the observed relationships between our study variables.

Finally, although we have used our discussion of limitations to also make suggestions for future research, there is at least one other broad area with respect to an alliance competence that merits further examination: alliance governance. Potential research questions here include the following: How does such a competence affect the need, use, and effectiveness of various types of governance (such as contacts, relational norms, and transaction-specific investments)? In addition, How does an alliance competence affect ethical behavior, conflict, and conflict management?

Thus, although our initial test of a competence-based approach to alliance success is encouraging, more research is required. In addition to studies replicating this research and addressing the limitations noted above, future research that examines a model of alliance success that integrates alliance competence, relational variables, and resource variables appears promising. Such an examination would put us one step closer to a holistic explanation of alliance success. Given the degree of academic and managerial merit that this line of research appears to hold, potential rewards for researchers who extend the antecedents and consequences of alliance competence are great.

APPENDIX

Scale Items and Reliabilities

Idiosyncratic Resources (four-item reflective measure, $\alpha = .83$)

1. Both of us have created capabilities that are unique to this alliance.
2. Together we have developed a lot of knowledge that is tailored to our relationship.
3. Together we have invested a great deal in building up our joint business.
4. Both of us have made a great deal of investments in this relationship.
5. If this relationship were to end, we would be wasting a lot of knowledge that is tailored to our relationship.^a
6. If either company were to switch to another partner, we would lose a lot of investments made in the present relationship.^a

Complementary Resources (three-item reflective measure, $\alpha = .74$)

1. We both contribute different resources to the relationship that help us achieve mutual goals.
2. We have complementary strengths that are useful to our relationship.
3. We each have separate abilities that, when combined together, enable us to achieve goals beyond our individual reach.

Joint Alliance Success (three-item reflective measure, $\alpha = .92$)

1. We have achieved a high level of joint profits between us.
2. We have generated a lot of profits together.
3. We have increased joint profits shared between us.

Joint Senior Management Commitment (two-item reflective measure)

1. We both have senior-level management commitment toward the use of alliances to achieve strategic goals.
2. Senior management in both firms believes that alliances play a role in the future success of each firm.
3. When the situation calls for it, top-level management in our respective firms supports the use of alliances.^a
4. Senior management in each company encourages the use of alliances to achieve strategic goals.^b

Joint Alliance Competence (nine-item composite measure)

(Facet A: Alliance Experience, three-item reflective measure, $\alpha = .84$)

1. We both have a deep base of partnership experience.
2. We each have participated in many alliances.
3. Individually, we have been partners in a substantial number of alliances.

(Facet B: Alliance Manager Development Capability, three-item reflective measure, $\alpha = .90$)

1. We both have programs to develop capable alliance managers.
2. We each understand how to produce effective alliance managers.
3. We both effectively train competent alliance managers.
4. We each know how to identify effective alliance managers.^a

(Facet C: Partner Identification Propensity, three-item reflective measure, $\alpha = .77$)

1. We each actively search for promising alliance partners.
2. Alliances that can help our business are sought out by both of us.
3. We each are constantly seeking partnering opportunities.
4. We both are always looking for firms that we can partner with to jointly develop competitive advantage.^a

a. Deleted during the substantive validity testing pretest procedure.

b. Deleted during the measurement model analysis.

NOTE: "We," "us," and "our" refer to the two firms; α = Cronbach's alpha scale reliability.

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NOTES

1. The empirical research reports and focuses on a specific measure of alliance success—alliance profitability.

2. When we use the term *higher order resource*, we are using the terminology of competence-based theory and resource-advantage theory

(which distinguish between lower order and higher order resources) and are not implying that our joint alliance competence measure is or ought to be a second-order factor.

3. Thus, the dyadic measures are not objective and are based on the perceptions of one key informant.

4. Managers used in the pretest are not part of the sample of managers who were sent the final survey.

5. This is supported by postpretest interview data that we gathered from our pretest participants.

6. The gammas for the formative measure of joint alliance competence are .18, .19, .18 for alliance experience; .16, .15, .14 for alliance manager development capability; and .16, .15, .15 for partner identification propensity.

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