MANAGING STRATEGICALLY IN AN INTERCONNECTED WORLD

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Acquiring Partners' Capabilities: Outcomes of Scale and Link Alliances between Competitors

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This chapter investigates the outcomes of strategic alliances among competing firms. Our arguments focus on the potential for partners to learn about each other's capabilities, using different forms of alliance outcomes as indicators of capability acquisition. Research traditions in economics, organization theory, and strategy have long recognized that pairwise and multi-firm alliances such as joint ventures and commercial partnerships have critical influences on business strategy and performance (Richardson, 1972; Berg, Duncan & Friedman, 1982; Oliver, 1990). There is substantial disagreement, however, concerning the fundamental nature of the influences. Some arguments stress the potential benefits of alliance activity to all partners, while others emphasize the risks to one or more partners (Singh & Mitchell, 1996). We hope that this research will help disentangle these arguments.

The chapter views strategic alliance outcomes through two complementary theoretical lenses: the resource-based view and transaction cost economics. The resource-based view suggests that firms' competitive advantages derive from idiosyncratic sets of tacit knowledge-based resources (Penrose, 1959; Wernerfelt, 1984; Conner, 1991; Amit & Schoemaker, 1993). In a
complementary perspective, the transaction cost approach argues that firms organize the governance of idiosyncratic resources in ways that will tend to protect their value from being appropriated by an exchange partner (Williamson, 1991a, b). The two views tend to converge in their explanation for the formation of interfirm alliances. The joint argument of the two perspectives is that it is difficult and risky for firms to exchange idiosyncratic resources in arm's-length contracts, due both to knowledge-based difficulties in managing the exchange of tacit resources and risks that arise from the difficulty of protecting oneself from opportunistic behavior by an exchange partner (Chi, 1994; Mitchell & Singh, 1996).

Strategists and organizational theorists dating to Commons (1934), Coase (1937), Barnard (1938), Simon (1957), and others have long recognized that no one business can create all critical resources needed to prosper and grow. Instead, collaboration among businesses that possess complementary resources is often necessary for survival and growth. Several authors argue that interfirm alliances provide a means of combining tacit resources held by different firms in order to exploit new business opportunities, while both addressing issues that arise from knowledge-based coordination difficulties and providing protection from immediate opportunistic behavior (Teece, 1986; Itami & Roehl, 1987; Mitchell & Singh, 1993). Collaboration appears to be an effective way of combining resources that are subject to a high degree of knowledge-based market failure because interfirm collaboration often provides a vehicle for ongoing interpersonal contact between the allied firms (Mitchell & Singh, 1996). Moreover, collaboration provides a means for firms to protect the value of their resource through financial and organizational safeguards (Hennart, 1988; Kogut, 1988a; Williamson, 1991a; Jorde & Teece, 1990). Thus, collaboration provides potential ongoing benefits to all partners.

Despite the potential advantages of collaboration, a further argument stresses that collaboration may create favorable conditions for interpartner learning and thus may allow one partner to appropriate and internalize resources that another partner contributed (Hamel, Doz & Prahalad, 1989; Balakrishnan & Koza, 1993). Such appropriation may be a particularly critical issue when alliances associate competing firms. When the partner firms in an alliance are also competitors in a product market, there will often be many opportunities for interpartner learning and severe competitive consequences of such learning (Hamel, 1991). Alliances between competitors can lead to the loss of critical proprietary knowledge, to increased dependence of one partner vis-à-vis the other, and even to the takeover of one partner by the other (Bleeke & Ernst, 1995). Distinguishing between alliances that are likely to contribute to all partners and alliances that will tend to favor some partners is both conceptually and managerially important.

To assess the impact of alliances on the partnering firms, our analysis focuses on the likelihood of four types of outcomes among the alliances in
the sample, including cases in which: (1) partnering companies reorganize responsibility for the activities of the alliances, (2) one partner takes over the joint activity, (3) alliances continue within their initial distribution of activities, and (4) the partners dissolve the alliance. The first two types of alliance outcomes will tend to mark greater capability acquisition and signal more unbalanced consequences than the latter two types.

We show that alliance outcomes vary systematically across link and scale alliances in a sample that includes 227 alliances among competing firms in several manufacturing industries in Europe, North America, and Asia, covering the period from 1952 to 1996. Link alliances are cases in which partners contribute different capabilities, while scale alliances are partnerships in which firms contribute similar capabilities. Partners are more likely to reorganize or take over link alliances, while scale alliances are more likely to continue without material changes. Our results could help managers anticipate the likely evolution of the alliances they form and to benefit from partnerships while avoiding the negative consequences they might encounter. The results help shed light on the debate concerning the relative benefits and risks of alliance activity, while demonstrating that alliances provide an evolutionary means by which business capabilities diffuse through an industry.

BACKGROUND AND PREDICTIONS

PRIOR RESEARCH ON ALLIANCE OUTCOMES

Several perspectives have examined alliance outcomes. One approach has been to study the performance of the alliance itself, while another stream of research has focused on the consequences of the alliance for the partner firms.

Most early studies on the performance of joint ventures and other alliances tried to link success, generally assessed on the basis of manager opinions, to the distribution of ownership and control among the parent firms. Killing (1982, 1983) found that dominant partner joint ventures tended to outperform shared management joint ventures, but several other studies have found only limited support for these findings (Janger, 1980; Beamish, 1984, 1985; Beamish & Banks, 1987). Such inconclusive results may stem from the fact that issues of alliance control are not the sole determinant of alliance performance (Kogut, 1988b; Geringer & Hebert, 1989). In order to overcome such limitations, other studies have tried to link alliance performance to a wider set of factors. In a study of global aerospace alliances, for instance, Dussauge and Garrette (1995) found that alliances with more integrated forms of organization tended to outperform less-integrated alliances.
Approaching the question of alliance success on the basis of more objective measures, some studies have tried to identify factors that influence joint venture duration and stability. Harrigan (1988) examined the influence of partner asymmetries based on size, nationality, relatedness, and joint venturing experience on joint venture duration and survival. The results of this study suggest that alliances between similar firms tend to be more stable than asymmetric partnerships. Kogut (1988a, b) found that the structure of the industry, the scope of a joint venture, the degree of rivalry between the partners, and partner nationalities affected joint venture stability. This study showed that these factors also affected the way in which joint ventures terminated, either by dissolution or by takeover. In another study of international expansion alliances, Kogut (1991) offers an interpretation of joint ventures as options to invest in new markets. According to this analogy, a firm exercises the option, meaning that the entering partner acquires the joint venture, when growth in the targeted market increases the value of the joint venture and when this entering partner has learnt enough about the local market to operate alone. In this approach, joint venture survival no longer stands as an unambiguous criterion of success. In this perspective, the focus shifts from the performance of the joint venture itself to examining the consequences of joint venturing for the partner firms.

Research that explicitly examines the impact of alliances on the partner firms rather than the success of the collaborative venture itself falls into two main categories. First, several event studies have examined the stock market reaction to the announcement of joint venture formation. McConnell and Nantell (1985) and Woolridge and Snow (1990) showed that the formation of joint ventures had a positive impact on the stock market value of both partner firms. Koh and Venkatraman (1991), using a similar approach, replicated these results and demonstrated that the formation of joint ventures between firms that had related businesses had a stronger positive impact on the stock market value of the parents than the formation of joint ventures uniting partners with unrelated businesses.

A second stream of research has examined alliance outcomes by assessing their influence on the long-term strategic position of each of the partner firms. Initial studies in this vein emphasized in-depth case analysis (Hamel, 1990). In parallel with the resource-based view of the firm, these studies have insisted on the importance of learning and skill acquisition that tend to occur between the allied firms, especially in alliances associating competitors (Doz, 1988; Hamel, Doz & Prahalad, 1989; Hamel, 1991; Kanter, 1994). A few larger sample studies also have explored the impact of alliance activity on the financial performance and survival of the parent businesses (Berg, Duncan & Friedman, 1982; Hagedoorn & Schakenraad, 1994; Mitchell & Singh, 1996; Singh & Mitchell, 1996). The studies report ambiguous outcomes, with parents sometimes benefiting from alliance activity and sometimes being placed at risk.
Our study, focusing on the potential for interpartner learning to affect the outcome of alliances between competitors, aims at contributing to this last stream of research. We address issues concerning learning by alliance partners in link and scale alliances and offer predictions concerning alliance outcomes.

**Learning and Capability Acquisition in Alliances Between Competitors**

Research on inter-organizational learning (Argyris & Schön, 1978; Fiol & Lyles, 1985; Dosi, 1988; Moingeon & Edmondson, 1996) has shown that firms are better able to acquire new capabilities when they already have a competence base that is similar to the new knowledge that they seek. Cohen and Levinthal (1990) use the term "absorptive capacity" to express this idea. In this view, firms are more likely to graft a new skill successfully to a closely related competence base. Firms operating in the same business typically share such a common competence base because they use similar technologies, satisfy similar customer needs, serve similar customers, and offer related products. Therefore, alliances between competitors are likely to create a context that favors interpartner learning (Hamel, 1991). Such interpartner learning in strategic alliances between rival firms must not, however, be confused with deliberate technology transfers organized in the context of international joint ventures set up in developing countries with local partners (Lyles & Salk, 1996). Indeed, while partner firms may take advantage of strategic alliances to internalize capabilities they lack, it is unlikely they would deliberately transfer valuable capabilities to competitors.

While firms that compete in the same industry share a similar competence base, they are also likely to possess some specific, idiosyncratic skills and capabilities (Nelson & Winter, 1982; Nelson, 1991; Rumelt, Schendel & Teece, 1991). Differences in the resource endowments of factors such as technologies, engineering and production capabilities, products, and market presence create the potential for firms to combine complementary assets, through alliances, in order to pursue new business opportunities. In addition, firms with complementary resource endowments potentially have significant opportunities to learn from one another. The firms can then use an alliance as a means of acquiring new resources from their partner in those areas where they have deficiencies. If collaboration is to be a mechanism by which firms acquire such resources, then not only do the partners' resource endowments have to be different, but the firms must also make different contributions to the joint endeavor.
**SCALE AND LINK ALLIANCES**

Analysts often categorize alliances in terms of the similarity of the respective contributions that the partner firms make to the alliance. Porter and Fuller (1986, p. 336) contrast "X form" and "Y form" coalitions between competitors, stating that "... in X coalitions, firms divide the activities within an industry between themselves (for example, one partner manufactures while letting the other market). In Y coalitions, the firms share the actual performance of one or more value activities (for example, a joint marketing agreement)". Hennart (1988), in a similar fashion, identifies scale joint ventures, on the one hand, and link joint ventures, on the other. According to Hennart, "Scale JVs are created when two or more firms enter together a contiguous stage of production or distribution or new market ... In link JVs, the position of the partners is not symmetrical. The JV may constitute a vertical investment for one of the parties and a diversification for the other". Garrette and Dussauge (1995) generated an empirically based taxonomy of strategic alliances between rival firms that confirmed the distinction between scale and link alliances, and further suggested that this distinction relates strongly to a wide range of other strategic and organizational features of alliances.

The scale-link distinction will also tend to reflect different objectives that firms assign to an alliance. Scale alliances, in which the partners contribute similar resources pertaining to the same stage or stages in the value chain, will produce significant economies of scale for those activities that are carried out in collaboration: Porter and Fuller (1986) note that scale alliances allow the partners to achieve scale economies and to reduce excess capacity. Such scale alliances include joint R&D efforts, the joint production of a particular component or sub-assembly, or the manufacture of an entire product. The PRV alliance set up in 1971 by Peugeot, Renault and Volvo to develop and manufacture a common V6 engine falls into this category, as does the Airbus consortium associating four European aircraft manufacturers that jointly produce a range of commercial airplanes. Such scale alliances provide a way of avoiding, or at least postponing, mergers in industries undergoing a strong concentration process (Dussauge & Garrette, 1995).

Link alliances, in contrast, include partnerships in which one partner provides market access to products initially developed by the other firm, such that the two allies create a form of customer-supplier relationship. The well-known agreements between Chrysler and Mitsubishi, as well as those linking General Motors to Isuzu, correspond to this type of alliance. These link alliances do not preclude joint manufacturing in some cases, such as in the NUMMI joint venture associating General Motors and Toyota, provided the other components of the value-chain remain distributed between the partner...
firms themselves. In this way, link alliances aim at combining the different and complementary skills and resources that each partner contributes. Because of this complementarity, such link alliances are also built on the mutual dependence of the partner firms *vis-à-vis* one another. In such situations, firms have incentives to reduce their dependence by acquiring the capabilities that underlie the other partner's contributions. Therefore, the distinction between scale and link alliances is likely to influence the extent to which learning occurs between the partner firms.

**Hypotheses**

The core proposition of this chapter is that link alliances among competitors lead to greater potential levels of learning and capability acquisition than do scale alliances among competitors. Partner firms that are also competitors have incentives to acquire capabilities they lack, in order to improve their competitive position and reduce their dependence on a partner (Hamel, Doz & Prahalad, 1989). Link alliances, which combine complementary skills possessed by the partner firms, offer more opportunities for learning than scale alliances, in which all allies contribute similar skills and resources to the joint project (Hamel, 1991; Mowery, Oxley & Silverman, 1996).

As it is virtually impossible to observe interpartner learning directly, we use alliance outcomes as indicators of capability acquisitions. We focus on four types of alliance outcomes: (1) cases in which partnering companies reorganize responsibility for the activities of the alliance, (2) cases in which one partner takes over the joint activity, (3) cases in which alliances continue within their initial distribution of activities, and (4) cases in which the partners dissolve the alliance. The first two types of alliance outcomes will tend to mark greater capability acquisition than the latter two types of outcomes.

We first address alliance reorganization and define reorganization as a major change in the distribution of tasks such as R&D, manufacturing, assembly, and marketing among the partner firms. The distribution of tasks in an alliance typically reflects the respective capabilities of the partner firms, with partners undertaking tasks for which they are particularly skilled. Although firms might sometimes allocate tasks to partners that lack certain capabilities so that the partner can learn by doing, particularly in technology transfer alliances among non-competing firms, this will be an uncommon goal in strategic alliances between competitors. Thus, reorganizations of alliances among competitors are likely to occur when one of the partners has developed the ability to carry out certain tasks that the alliance previously allocated to the other partner, i.e. when skill transfers have taken place within the alliance. For instance, let us imagine an alliance between a European and a Japanese firm to market Japanese-made products in Europe. If,
after some time, the European firm undertakes local manufacture of products that the Japanese partner designed, this would signal that the European firm had acquired new manufacturing capabilities. Similarly, if the Japanese partner starts marketing the same products in Europe on its own, this would signal that the Japanese firm had acquired new marketing skills. Thus, partners face greater incentives to reorganize link alliances than scale alliances, because link alliances lead to greater potential levels of learning and capability transfers between the partners than do scale alliances.

Hypothesis 1. Link alliances among competing firms are more likely than scale alliances to undergo reorganization.

We next turn to alliance takeover. This occurs when the alliance ends with one of the partners undertaking all previously collaborative activities itself. Takeovers include cases where one partner bought the joint venture and cases when one partner acquired the other partner. We interpret takeover as an extreme case of reorganization, in which one partner no longer needs to collaborate to carry out what was formerly a joint activity.

Pursuing the logic of capability acquisition, if partner A acquires key capabilities relating to the joint activity, partner A no longer depends on partner B’s contributions and can therefore operate autonomously. When this happens, the value of the joint venture is greater for partner A, which can manage the activity on its own, than for partner B, which still lacks certain of the necessary skills.

Partner A now has two incentives to take over the alliance. First, straightforward transaction cost logic suggests that the firm may be better able to protect the value of what it has learned by internalizing the activities of the alliance. Second, Kogut’s (1991) option argument about joint ventures suggests that partner A will exercise its option to acquire the joint venture before partner B accesses the capabilities it lacks and the value of the joint venture becomes equal for both partners. In some cases, the firms can build in the possibility of a takeover outcome into the partnership agreement, in which partner A then has a call option on the joint venture while partner B has a put option. Overall, learning and skill appropriation tend to favor the takeover of an alliance by one partner (Balakrishnan & Koza, 1993). Therefore, link alliances, which offer greater opportunities for learning and skill appropriation, are more likely than scale alliances to end in a takeover by one partner.

Hypothesis 2. Link alliances among competing firms are more likely than scale alliances to end in takeover by a partner.

We next address alliance continuation without reorganization, which we expect to be most common for scale alliances. In contrast with link alliances,
scale alliances primarily provide scale economies and size effects rather than combining complementary resources. At the inception, the partners in scale alliances tend to possess similar skills and resources. Therefore, scale alliances offer fewer opportunities for learning than do link alliances. Thus, capability transfers between the partners of a scale alliance will tend to be quite limited and should not require major reorganizations. This argument is consistent with the view that symmetric alliances are more stable than asymmetric partnerships (Harrigan, 1988). As firms cannot determine the distribution of tasks within scale alliances on the basis of any pre-existing specialization of the partners, the primary motive for choosing an initial organization of an alliance will tend to be the maximization of scale economies (Hennart, 1988). Thus, the primary incentive to reorganize the alliance would be to further increase efficiency, assuming the initial distribution of tasks turned out to be sub-optimal. If the organization that the firms adopt initially is sufficiently efficient, then there will even be a disincentive to reorganize, because the reorganization costs will offset potential increases in economies of scale (Williamson, 1991b).

**Hypothesis 3.** Scale alliances among competing firms are more likely than link alliances to continue without reorganization or takeover.

Finally, we turn to alliance dissolution with no takeover or prior reorganization. Such a shutdown signals that an alliance has either failed or, at least, has outlived its purpose (Kogut, 1988b). On the one hand, link alliances might be more likely than scale alliances to dissolve, for two reasons. First, firms will sometimes dissolve link alliances after learning necessary skills from their partners. Second, the partners in a link alliance might be more likely to misinterpret their partners' complementary capabilities than in scale alliances, where partners contribute similar capabilities. If so, then firms might be more likely to shut down link alliances than scale alliances because link alliances are more likely to fail to meet initial expectations. However, like link alliances, scale alliances also may reach the end of their need or fail to meet expectations. Therefore, we expect scale and link alliances to have a similar likelihood of dissolution.

**Hypothesis 4.** Scale and link alliances among competing firms are equally likely to dissolve with no takeover or prior reorganization.

In summary, we expect link alliances to create greater opportunities than do scale alliances for firms to learn from their partners. In turn, the learning potential will make link alliances more likely to undergo reorganization or takeover. By contrast, scale alliances will be more likely to continue without reorganization or takeover. The two types of alliances will be
equally likely to dissolve. Alliance outcomes are indirect indicators of learning that provide useful information about capability transfer between alliance partners.

**Method**

**Data**

We tested our hypotheses on a set of 227 alliances among competing firms in a range of manufacturing industries. The alliances include equity joint ventures and other forms of interfirm partnerships. The industries in the sample tend to be oligopolistic, open to international trade, R&D intensive, subject to significant economies of scale, and globally competitive. Because alliances in such industries offer a high potential for efficiency gains and few opportunities for limiting competition, most value-creating alliances emerge in industries with these features (Jacquemin, Buigues & Ilzkovitz, 1989; Millington & Bayliss, 1995). We selected our sample in industries with these characteristics, similar to prior research on strategic alliances (Ghemawat, Porter & Rawlinson, 1986; Hergert & Morris, 1987; Hagedoorn, 1993; Garrette & Dussauge, 1995). The three most frequent industries in our sample are automobiles (29%), aerospace (19%), and telecommunications/electronics (35%), together totaling 83% of the cases.

All the alliances in the sample involve partner firms from North America, Europe or Asia (Japan and Korea) and entail operations in one of these three zones. We excluded agreements that did not include any of the partners’ home markets. For instance, we did not consider agreements such as the Australian General Motors–Toyota joint venture or the Autolatina alliance that Ford and Volkswagen formed in Brazil and Argentina. We also excluded the supply of components and sub-assemblies from one manufacturer to another because such exchanges are closer to market transactions than to strategic alliances. In addition, we excluded government-sponsored research consortia, such as those set up by the European Commission and MITI in Japan. The resulting sample focused on strategic alliances that involve the partners’ core businesses and markets.

Each data point in our sample corresponds to an agreement between two or more partners, covering a specific business area. For example, in aerospace we considered such segments as commercial aircraft, helicopters, missiles, fighter aircraft, and aero-engines. Each alliance operates in one of the three above-mentioned geographic zones. To identify alliances in which reorganizations took place, we categorized collaborative activities into four main functions, including R&D, manufacturing, assembly and marketing. Each alliance corresponds to a specific allocation of R&D, manufacturing,
assembly, and marketing tasks among the partners. Thus, an alliance between an American and a European telecommunications equipment manufacturer by which they each agree to market one of the other’s products in their respective home markets would include two cases: one in which the European partner markets the American system in Europe, and a second in which the American partner markets the European system in North America.

We gathered the data for the study from secondary sources such as industry reports, manufacturer associations’ publications, and journals specializing in specific industries. Examples include Automotive News, Aviation Week and Space Technology. When necessary, we validated and complemented the data by interviewing industry analysts and company executives.

**Variables**

We defined four alliance outcome dependent variables. Each outcome measure was a 0–1 dummy variable that denoted whether an alliance underwent reorganization before the end of the study period (REORGANIZATION), underwent takeover before the end of the study period (TAKEOVER), continued until the end of the study period without reorganization or takeover (CONTINUE), or shut down without reorganization or takeover (DISOLVE). For the reorganization variable, we first observed how the partners allocated the four functions at the beginning of the alliance and then considered any major subsequent change in this allocation, such as a partner beginning or ceasing to carry out manufacturing or marketing, to be a reorganization.¹

Tables 17.1(a) and 17.1(b) report summary statistics and correlations for the variables. While there are significant correlations among some of the independent variables, the results that we report later in the chapter were robust to eliminating individual variables.

The key independent variable for the empirical analysis is the alliance type. We set a dummy variable equal to 1 for link alliances and 0 for scale alliances (LINK ALLIANCES). We examined each alliance to determine whether to class it as either a scale alliance or a link alliance according to the criteria that we described in the “Scale and link alliances” section of the paper. Two authors of this study each coded the variable independently. We then asked an industry expert to independently classify alliances in the automobile, aerospace, data processing, electronics, and telecommunications industries. After undertaking this process, we dropped eleven ambiguous cases because of conflicting coding.

We defined several control variables to address other factors that might affect alliance outcomes. The control variables include industry, parent
Table 17.1(a) Variable summary statistics (227 cases)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORGANIZE</td>
<td>0.18</td>
<td>0.39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>TAKEOVER</td>
<td>0.20</td>
<td>0.40</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>CONTINUE</td>
<td>0.43</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>DISSOLVE</td>
<td>0.19</td>
<td>0.39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>LINK ALLIANCES</td>
<td>0.52</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>LATER FOUNDING YEAR</td>
<td>82.8</td>
<td>8.3</td>
<td>52</td>
<td>96</td>
</tr>
<tr>
<td>PARENT COMPETITIVE ASYMMETRY</td>
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<td>0.44</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>MULTI-FIRM ALLIANCE</td>
<td>0.11</td>
<td>0.31</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PARENT EQUITY HOLDING</td>
<td>0.22</td>
<td>0.41</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>JV ALLIANCE</td>
<td>0.52</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PARENTS DOMESTIC</td>
<td>0.13</td>
<td>0.33</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PARENTS SAME-CONTINENT</td>
<td>0.34</td>
<td>0.48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>PARENTS INTER-CONTINENT</td>
<td>0.53</td>
<td>0.50</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ZONE INTER-CONTINENT</td>
<td>0.32</td>
<td>0.47</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>ZONE SAME-CONTINENT</td>
<td>0.68</td>
<td>0.47</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>INDUSTRY AUTO</td>
<td>0.29</td>
<td>0.46</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>INDUSTRY AERO</td>
<td>0.19</td>
<td>0.39</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>INDUSTRY TEL/ELECT</td>
<td>0.35</td>
<td>0.48</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>INDUSTRY OTHER</td>
<td>0.17</td>
<td>0.37</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

Alliance duration before outcome (years; uncensored cases)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>S.D.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>REORGANIZE</td>
<td>8.2</td>
<td>7.5</td>
<td>1</td>
<td>36</td>
</tr>
<tr>
<td>TAKEOVER</td>
<td>6.8</td>
<td>7.0</td>
<td>1</td>
<td>41</td>
</tr>
<tr>
<td>CONTINUE</td>
<td>10.5</td>
<td>7.1</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>DISSOLVE</td>
<td>8.0</td>
<td>7.7</td>
<td>1</td>
<td>30</td>
</tr>
</tbody>
</table>

origin, geographic coverage, parent competitive position, governance mode, multi-firm partnerships, and alliance founding year.

We defined four 0-1 dummy variables to distinguish alliances set up in the aerospace, automobile, telecommunications/electronics, and other industries (INDUSTRY AUTO, INDUSTRY AERO, INDUSTRY TEL/ELECT, INDUSTRY OTHER). Prior research (Kogut, 1988b; Harrigan, 1985; Lorange & Roos, 1992; Garrette & Dussauge, 1995) suggests that link and scale alliance types will distribute unevenly among industries, so that the industry variable may influence alliance outcomes. In addition, whatever their type may be, we expect alliances in industries with shorter product life-cycles to be less stable, so that we expect telecommunications/electronics alliances to be less stable than many other alliances.

We defined three 0-1 dummy variables to denote partnerships involving parent firms from the same country (PARENTS DOMESTIC), same continent (PARENTS SAME-CONTINENT), or different continents (PARENTS INTER-CONTINENT). Prior research argues that the geographic origins of the partner firms may influence alliance outcomes (Harrigan, 1988; Nohria &
| Variable                              | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     | 10    | 11    | 12    | 13    | 14    | 15    | 16    | 17    | 18    | 19     |
|--------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| continue 1                          | 1     | -0.42 | -0.43 | -0.41 | -0.27 | 0.27  | 0.01  | 0.02  | -0.15 | 0.21  | 0.15  | 0.01  | -0.10 | 0.14  | -0.14 | 0.08  | -0.23 | 0.16  |
| dissolve 2                          | -0.42 | 1     | -0.2  | -0.23 | -0.08 | -0.12 | -0.12 | -0.09 | -0.04 | -0.24 | -0.02 | 0.10  | -0.08 | -0.07 | 0.07  | -0.14 | 0.02  | 0.21  | -0.13 |
| takeover 3                           | -0.43 | -0.24 | 1     | -0.23 | 0.21  | -0.06 | 0.14  | 0.01  | 0.12  | 0.19  | -0.09 | -0.01 | 0.07  | -0.13 | 0.13  | -0.08 | -0.13 | 0.19  | -0.02 |
| reorganize 4                         | -0.41 | -0.23 | -0.23 | 1     | 0.20  | -0.17 | -0.04 | -0.12 | 0.12  | -0.22 | -0.08 | -0.10 | 0.15  | 0.02  | -0.02 | 0.15  | 0.01  | -0.21 | -0.06 |
| link alliances 5                     | -0.27 | -0.08 | 0.21  | 0.20  | 1     | 0.05  | 0.21  | 0.27  | 0.18  | -0.12 | -0.13 | -0.44 | 0.51  | 0.51  | 0.51  | 0.23  | -0.41 | 0.01  |
| later founding year 6               | 0.27  | -0.12 | -0.06 | -0.17 | 0.05  | 1     | -0.05 | -0.15 | -0.07 | 0.07  | 0.07  | -0.13 | 0.07  | 0.07  | 0.07  | 0.28  | 0.28  | 0.12  | 0.42  |
| parent competitive asymmetry 7      | 0.01  | -0.12 | 0.14  | -0.04 | 0.21  | -0.05 | 1     | -0.09 | 0.19  | 0.12  | -0.04 | -0.16 | 0.18  | 0.00  | 0.00  | 0.15  | 0.08  | 0.02  | 0.08  |
| multi-firm alliance 8               | 0.02  | 0.09  | 0.01  | -0.12 | -0.27 | -0.15 | -0.09 | 1     | -0.01 | 0.16  | 0.00  | 0.17  | -0.16 | 0.25  | -0.25 | 0.03  | 0.24  | -0.04 | 0.15  |
| parent equity holding 9             | -0.15 | -0.04 | 0.12  | 0.12  | 0.18  | 0.07  | 0.19  | -0.01 | 1     | -0.19 | -0.14 | -0.02 | 0.11  | -0.02 | 0.02  | 0.11  | -0.04 | 0.04  |
| JV alliance 10                      | 0.21  | -0.24 | 0.19  | -0.22 | -0.12 | -0.07 | 0.12  | 0.16  | -0.19 | 1     | -0.03 | -0.02 | 0.04  | 0.05  | 0.05  | 0.05  | 0.06  | 0.04  |
| parents domestic 11                 | 0.15  | -0.02 | -0.09 | -0.08 | 0.13  | 0.29  | -0.04 | 0.00  | -0.14 | 0.03  | 1     | -0.28 | -0.41 | 0.08  | 0.08  | 0.13  | -0.08 | -0.06 |
| parents same-continent 12           | 0.01  | 0.10  | 0.01  | -0.10 | -0.44 | -0.13 | 0.16  | 0.02  | -0.02 | -0.28 | 1     | -0.77 | 0.22  | 0.22  | -0.18 | 0.31  | -0.03 | -0.08 |
| parents inter-continent 13          | -0.10 | -0.08 | 0.07  | 0.15  | 0.51  | 0.07  | 0.18  | 0.16  | 0.11  | 0.04  | -0.41 | -0.77 | 1     | -0.56 | 0.26  | 0.08  | -0.24 | 0.07  |
| zone inter-continent 14             | 0.14  | -0.07 | -0.13 | 0.02  | -0.51 | -0.28 | 0.00  | 0.25  | -0.02 | 0.05  | 0.08  | 0.22  | 0.26  | 1     | -1.00 | -0.21 | 0.65  | -0.23 | -0.13 |
| zone same-continent 15              | -0.14 | 0.07  | 0.13  | -0.02 | 0.51  | 0.28  | 0.00  | -0.25 | 0.02  | -0.05 | -0.22 | 0.26  | -1.00 | 1     | 0.21  | -0.65 | 0.23  | 0.13  |
| industry auto 16                    | 0.05  | -0.14 | -0.08 | 0.15  | 0.23  | 0.12  | -0.15 | -0.03 | 0.11  | -0.24 | 0.13  | -0.18 | 0.08  | 0.21  | 0.21  | -0.31 | -0.47 | -0.29 |
| industry aerop 17                   | 0.08  | 0.02  | -0.13 | 0.01  | -0.41 | -0.42 | 0.08  | 0.24  | -0.04 | 0.06  | -0.08 | 0.31  | -0.24 | 0.65  | -0.65 | -0.31 | 1     | -0.36 |
| industry tel/elect 18               | -0.23 | 0.21  | 0.19  | -0.11 | 0.01  | 0.11  | 0.02  | -0.04 | 0.04  | 0.04  | -0.06 | 0.05  | 0.07  | 0.23  | -0.47 | -0.36 | 1     | -0.33 |
| industry other 19                   | 0.16  | -0.13 | -0.02 | -0.06 | 0.15  | 0.16  | 0.08  | -0.15 | 0.15  | 0.19  | 0.01  | -0.08 | 0.07  | -0.13 | 0.13  | -0.29 | -0.22 | -0.33 | 1     |
Garcia Pont, 1991; Hergert & Morris, 1987; Ghemawat, Porter & Rawlinson, 1986; Beamish & Banks, 1987). Many analysts argue that, for cultural and organizational reasons, international alliances create more potential for capturing valuable knowledge through collaboration than domestic alliances (Reich & Mankin, 1986; Hamel, Doz & Prahalad, 1989; Hamel, 1991; Aoki, 1986). We must note, however, that recent empirical work challenges this claim (Mowery, Oxley & Silverman, 1996). Inter-continental alliances might be more likely to end than domestic partnerships or intra-continental alliances if cultural differences between the partner firms create greater instability (Harrigan, 1985, 1988). In the same context, we defined variables to denote the geographic coverage of the alliance, because the geographic, economic and political context in which alliances are formed might have an influence on their fate (Gomes-Casseres, 1990; Parkhe, 1991; Agarwal & Ramaswamy, 1992). We determined whether the alliance covered Europe, Asia, North America, or a combination of these zones. A dummy variable, ZONE INTER-CONTINENT denoted alliances, such as Airbus, that sold their output outside the continent in which the firms based the alliance. ZONE SAME-CONTINENT denoted alliances, such as Rover Honda and NUMMI, that sold goods only within the base continent.

We defined a variable to denote the relative competitive position of the partners (PARENT COMPETITIVE ASYMMETRY). Partner asymmetries may influence alliance stability and performance (Harrigan, 1985, 1988; Doz, 1996). We approached the issue of asymmetry by comparing the sales of the partner firms in the industry in which the firms created the alliance. This is an appropriate measure because the alliance partners compete in the same industries and product lines, which we checked from secondary sources, industry analysts, and company executives. We considered a partnership to be unbalanced when, at the time the firms created the alliance, the sales of one of the partner firms were at least twice as large as the sales of the other partner. Franko (1971) and Ravenscraft and Scherer (1987) used similar factors. As suggested by Harrigan (1988), we expect unbalanced partnerships to be less stable than balanced ones.

We defined two variables to denote governance mode. A dummy variable identifies cases in which one partner holds a share of the other's equity (PARENT EQUITY HOLDING). Another dummy variable distinguishes equity joint ventures from collaborative agreements in which no legal entity was created (JV ALLIANCE). The impact of these factors on the outcome of alliances is ambiguous. On the one hand, more structured governance modes (equity holdings as well as equity joint ventures) might stabilize the partnership (Williamson, 1991a; Herrnart, 1988). On the other hand, equity participation might be a first step toward the complete takeover of the partner (Bleeke and Ernst, 1995) while the existence of a separate joint venture makes the takeover of the collaborative activity easier (Kogut, 1991).
Finally, we defined variables for multi-firm alliances and alliance founding year. A 0–1 dummy variable denoted alliances that had more than two partners (MULTI-FIRM ALLIANCE). Multi-firm alliances might be less stable than two-firm alliances. We defined a variable to denote the founding year of the alliance (LATER FOUNDING YEAR). More recent alliances will have less time in which to undergo a reorganization, takeover, or dissolution.

**Statistical Methods**

We tested the outcome hypotheses using four sets of maximum likelihood binomial logistic regression estimates and calculated one model for each of the four types of outcomes. Each model estimated the influences of the independent variables on the likelihood that an alliance would undergo a particular type of outcome, relative to the likelihood that the alliance would undergo any of the other three outcomes. In the model for each type of outcome, the focal outcome took a value of 1, while the other three types of outcomes took values of 0. In the reorganization analysis, for instance, the dependent variable for cases of reorganization took a value of 1, while cases that ended in takeover, shut down, or continued at the end of the study period took a value of 0.

The models took the form \( \ln \frac{P_i}{1-P_i} = bX_i \). In this equation, \( P_i \) is the probability that alliance \( i \) will undergo a particular type of outcome. A vector of covariates \( X_i \), with coefficient vector \( b \), including an intercept, linearly affects the log odds of the probability. The effect of a one-unit change of covariate \( j \) on the probability that an alliance will undergo a particular outcome is \( b_j \). We obtained the estimates using the logistic regression procedure of the SAS statistical package.

**Results**

Table 17.2 reports the results, which support the four hypotheses that we formulated in this chapter. Consistent with Hypotheses 1 and 2, the table shows that link alliances are more likely than scale alliances to undergo reorganization (model 1) or to end in takeover by one partner (model 2). Consistent with Hypothesis 3, link alliances are less likely than scale alliances to continue without reorganization (model 3). Consistent with Hypothesis 4, there is no significant difference in the likelihood of scale and link alliances dissolving with no takeover or prior reorganization (model 4). These results are consistent with our basic argument that link alliances offer greater opportunities for learning. Link alliances are more likely to lead to capability transfers between the partner firms and, in turn, to changes in the organization of cooperation. Scale alliances, in contrast, provide fewer opportunities for inter-partner learning and, therefore, tend to remain more stable over time.
Table 17.2  Logistic regression estimates of influences on alliance outcomes (positive coefficient indicates outcome is more likely)

<table>
<thead>
<tr>
<th></th>
<th>1 REORGANIZE</th>
<th>2 TAKEOVER</th>
<th>3 CONTINUE</th>
<th>4 DISSOLVE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coef.</td>
<td>S.E.</td>
<td>Coef.</td>
<td>S.E.</td>
</tr>
<tr>
<td>LINK ALLIANCES</td>
<td>1.32</td>
<td>0.63b</td>
<td>1.48</td>
<td>0.56c</td>
</tr>
<tr>
<td>LATER FOUNDING YEAR</td>
<td>-0.07</td>
<td>0.03c</td>
<td>-0.02</td>
<td>0.03</td>
</tr>
<tr>
<td>PARENT COMPETITIVE</td>
<td>-0.65</td>
<td>0.46a</td>
<td>0.67</td>
<td>0.53</td>
</tr>
<tr>
<td>ASYMMETRY</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MULTI-FIRM ALLIANCE</td>
<td>-1.33</td>
<td>1.10</td>
<td>0.48</td>
<td>0.66</td>
</tr>
<tr>
<td>PARENT EQUITY HOLDING</td>
<td>0.10</td>
<td>0.47</td>
<td>0.68</td>
<td>0.45a</td>
</tr>
<tr>
<td>JV ALLIANCE</td>
<td>-0.96</td>
<td>0.45b</td>
<td>1.34</td>
<td>0.45c</td>
</tr>
<tr>
<td>PARENTS SAME-CONTINENTd</td>
<td>0.29</td>
<td>0.78</td>
<td>0.91</td>
<td>0.75</td>
</tr>
<tr>
<td>PARENTS INTER-CONTINENTd</td>
<td>0.90</td>
<td>0.74</td>
<td>-0.03</td>
<td>0.72</td>
</tr>
<tr>
<td>INDUSTRY AEROe</td>
<td>-0.72</td>
<td>0.76</td>
<td>-0.77</td>
<td>0.92</td>
</tr>
<tr>
<td>INDUSTRY TEL/ELECTe</td>
<td>-0.77</td>
<td>0.50a</td>
<td>0.72</td>
<td>0.48a</td>
</tr>
<tr>
<td>INDUSTRY OTHERe</td>
<td>-0.62</td>
<td>0.64</td>
<td>-0.10</td>
<td>0.61</td>
</tr>
<tr>
<td>ZONE INTER-CONTINENTf</td>
<td>1.11</td>
<td>0.58b</td>
<td>0.01</td>
<td>0.58</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.45</td>
<td>2.37a</td>
<td>-2.91</td>
<td>2.41</td>
</tr>
<tr>
<td>Events (227)</td>
<td>41</td>
<td>45</td>
<td>98</td>
<td>43</td>
</tr>
<tr>
<td>Loglikelihood ratio c2 (12 d.f.)</td>
<td>38.8c</td>
<td>37.8c</td>
<td>72.8c</td>
<td>45.1c</td>
</tr>
<tr>
<td>No-covariate loglikelihood c2</td>
<td>214.4</td>
<td>226.1</td>
<td>310.4</td>
<td>220.4</td>
</tr>
</tbody>
</table>

*a p < 0.10  
*b p < 0.05  
*c p < 0.01 (one-tailed tests)  
*d Compared to PARENTS DOMESTIC  
*e Compared to INDUSTRY AUTO  
*f Compared to ZONE SAME-CONTINENT
Only a few of the control variables significantly influence alliance outcomes, including founding year, joint venture status, and telecommunications/electronics industry. The founding year of the alliance has the expected effect, in that younger alliances are less likely to undergo reorganization or dissolution, and are more likely to continue without reorganization. The existence of a distinct joint venture organization also has a significant influence on all four possible outcomes of alliances. As expected, a joint venture makes it more difficult to dissolve the alliance and increases the likelihood of continuation with no major change in organization. Joint ventures also increase the likelihood that one partner will take over the alliance. In addition, the results show that firms are less likely to reorganize alliances with equity joint ventures than simple collaborative agreements. This suggests that allocating tasks to a separate legal entity creates organizational constraints that make it difficult to shift tasks between the partners and the joint venture. Alliances within the telecommunications and electronics industrial sector are less likely than others to continue without major changes in organization and are also more likely to end in dissolution without any prior reorganization. The industry effect is consistent with our expectation, which stemmed from the relative length of product life-cycles in the different sectors. Alliances with inter-continental sales coverage, meanwhile, are more likely to reorganize and less likely to shut down than alliances with intra-continental sales scope. The inter-continental increased reorganization result likely stems from the many opportunities for learning that such alliances provide, while the reduced dissolution tendency likely stems from the greater investment and importance of such alliances. The control variables help understand the context in which alliance learning opportunities occur.

Overall, then, the results strongly support our predictions. Firms are more likely to reorganize or take over alliances in which partners contribute different capabilities, while alliances in which partners contribute similar capabilities are more likely to continue unchanged. In turn, these outcomes support the core arguments that underlie our predictions. Firms that cooperate with partners that have different capabilities gain opportunities to learn from their partners and then adapt their business activities and boundaries to take advantage of what they have learned.

**Conclusion**

Our findings contribute to the understanding of strategic alliances by empirically supporting the theoretical distinction between scale and link alliances. We demonstrate that scale and link alliances have contrasting patterns of evolution and lead to different outcomes.
Interpartner learning and skill transfers primarily appear to occur in link alliances. Indeed, by associating partners that contribute different capabilities to the joint endeavor, link alliances create favorable conditions in which such transfers may take place. The fact that firms are more likely to reorganize link alliances than scale alliances is an indicator that some of the partners are acquiring new skills. Because firms set up link alliances in order to take advantage of the complementary skills of the partner firms, the fact that the firms reorganize many link alliances by changing the task allocation of the partners suggests that the complementarity between the allies tends to shift over time. The changes most likely occur because the partners are acquiring capabilities from one another. Finally, the tendency for a partner to take over link alliances provides additional support for the argument that skill and capability transfers often occur in link alliances. The acquiring partner, therefore, appears to have learned the key skills that it needs to operate autonomously.

Some analysts have argued that alliances formed by rival firms are a means for one of the partners to strengthen its own position, while weakening that of its ally, through acquiring skills and valuable resources from its partner (Reich & Mankin, 1986; Hamel, Doz & Prahalad, 1989; Hamel, 1991). The underlying interpretation of alliances in this perspective is that of the Trojan Horse or the “kiss of death” (Ohmae, 1989). Our results suggest that such a view of alliances primarily applies to link alliances. This interpretation of link alliances implies that, in the process, one of the partner firms risks losing a competitive battle. However, such transfer of skills may sometimes be an explicit objective that the partners carry out over time in order to overcome problems in exchanging tacit capabilities. In turn, the firms may plan to sell the joint venture to one partner when they complete the skill transfer (Kogut, 1991).

Our results show that firms reorganize scale alliances much less frequently than link agreements. This supports the view that firms primarily form scale alliances in order to benefit from increased economies of scale while avoiding a merger of the allied firms. As long as the alliance successfully achieves this objective, the partners have little incentive to reorganize the alliance. The fact that partners take over scale alliances less often than link alliances also suggests that scale alliances help firms avoid or postpone outright industry consolidation.

In a more managerial perspective, our results suggest that firms form link alliances in order to undertake offensive strategies, while scale alliances tend to be more defensive in nature. Indeed, scale alliances are a means to compensate for a size disadvantage and may allow the allied firms to achieve parity with larger competitors. Link alliances, in contrast, may allow expanding firms to enter new markets and compete globally by tapping the skills and resources of their partners.
A limitation of our study, however, may be precisely that the alliance outcomes we observed are due as much to the underlying strategies of the partnering firms as they are to the alliances themselves. The type of alliance that a firm forms and the outcome of the alliance may both result from the strategies that the participating firms seek to carry out. For example, a firm that is expanding into new markets may form link alliances in order to acquire the resources it needs to succeed in the new markets, while ultimately planning to gain full control of their operations in the new markets. Clearly, though, the form of alliance that firms create will affect the opportunities for the partners to learn from each other and, in turn, will affect the evolution of the alliance and of the firms themselves.

In addition, our study does not take into account the entire life span of all the examined alliances. In particular, we did not investigate the subsequent fate of reorganized alliances. More research is needed to determine whether a first alliance reorganization significantly affects the likelihood of a second reorganization, takeover or dissolution.

At its most general level, this study investigates the evolutionary process of business strategy and performance. Nelson and Dosi (1993) argue that evolutionary theory in the social domain must identify processes of imperfect learning and discovery by which variations diffuse through an industry. Collaboration between firms provides one important form of route for variations in business capabilities to diffuse among firms. Collaboration is a key method by which firms learn new capabilities. The reorganization of a collaboration, either as a reshaped alliance or a takeover by a partner, then may help firms that have learned new skills protect the value of those skills. At the same time, collaboration is an imperfect learning process, in the sense that collaborating businesses often incur difficulties in attempting to learn and, indeed, might lose more than they gain. Such losses will often cause performance problems and sometimes lead to business failure. Advancing the theoretical understanding of business strategy and performance requires greater theoretical understanding of the evolutionary role of collaboration.

Collaboration among businesses that possess complementary resources is often necessary for survival and growth, while creating substantial risks. The duality of collaboration, with its concurrent benefits and risks, helps explain why so many once-successful businesses fail. Developing our understanding of the evolutionary roles of interfirm collaboration is an important aspect of developing our understanding of the concept of business strategy.

Note

1. In categorizing outcomes, we treated the first event type as the unique outcome for the case. That is, we defined as reorganization cases that first underwent reorganization and later underwent an outcome event, such as a second
reorganization, a dissolution, or a takeover. Of the 41 reorganization cases, only 16 underwent a second event, including six second reorganizations, nine takeovers, and one dissolution. We did not attempt to estimate the likelihood of the second event.

REFERENCES


