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Strategic Alliances and Partner Asymmetries**

The recent flurry of articles about joint ventures (and other forms of strategic alliance) suggest that yet another "fad" has captured the interest of strategists and scholars of strategic management. Although the jury is still out with regard to the efficacy of cooperative strategies — because reported success rates for interfirm ventures are low (Harrigan, 1985; Levine & Byrne, 1986) — use of strategic alliances continues. Despite the many problems that firms have encountered in using joint ventures and other cooperative strategies (and because cooperation is likely to play an increasingly important role among firms' strategy options in the future), there is considerable interest among managers in discovering a recipe for successful venturing.

Do differences among sponsoring firms with respect to each other (and in relationships with their jointly-sponsored ventures) influence the efficacy of their strategic alliances? Because managers must narrow the field in their quest to find the perfect venturing partner, a rigorous study of similarities and relationships between venture partners (and their effects on performance) may provide helpful insights about firms' successes in using joint ventures in their diversification strategies.

Literature Review and Hypotheses

Strategic alliances. Strategic alliances — joint ventures, cooperative agreements, et cetera — are partnerships among firms that work together to attain some strategic objective (Berg, Duncan & Friedman, 1982; Killing, 1983; Pate, 1969). "Joint ventures" create a jointly-owned entity, while non-equity forms of cooperation do not (Harrigan, 1985). For the purposes of my analysis, however, the unit of observation is *the venture* and all business activities where partners may cooperate are referred to as "ventures"— regardless of their ownership form and status as a separate organizational entity.

Sponsor-Sponsor and Sponsor-Venture Relationships

Diversification. Strategic alliances bring together partners that may be horizontally- or vertically-related to each other, but need not be related to each other at all. The ventures that they create may be horizontally- or vertically-related to either (or both) sponsoring firms, or may constitute an unrelated diversification for sponsoring firms. Related diversification strategies have generally been found to perform better than unrelated diversification for sponsoring firms. Related diversification strategies have generally been found to perform better than unrelated diversification strategies (Bettis, 1981; Bettis & Hall,

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1982; Montgomery, 1979; Montgomery & Singh, 1984; Rumelt, 1974), with some notable exceptions (Michel & Shaked, 1984; Rajagopalan & Harrigan, 1986). How does the relationship between sponsoring firm and venture influence its performance (if at all)? Our null hypothesis concerning diversification is that horizontally- and closely-related ventures are expected to perform better than ventures that are vertically-related (or unrelated to their sponsors) in terms of venture success, survival, and duration. Results suggest that the hypothesis cannot be rejected.

Partner asymmetry. Harrigan (1985) argues that ventures are more likely to succeed when partners possess complementary missions, resource capabilities, managerial capabilities, and other attributes that create a strategic fit in which the bargaining power of the ventur's sponsors is evenly matched. Partners' needs to be engaged in a particular strategic alliance are stabilizing to the relationship, while a wide variety of asymmetries are destabilizing to a venturing ralationship. Thus, partners will stay together as long as they need each other and their venture remains successful, unless the terms invoked by the bargaining agreement's "divorce clause" are so egregious that they constitute an exit barrier that perpetuates a partnership long after its usefulness to at least one of the partners has expired (Caves & Porter, 1976; Harrigan, 1980; Porter, 1976). Over 12 percent of the ventures in operation in 1986 in my sample were not mutually judged successful by their sponsors.

How do partner asymmetries — in relative asset size, national origin, and venturing experience levels — influence venture performance (it at all)? Our null hypothesis concerning partner asymmetry is that significant asymmetries among sponsoring firms are expected to be stabilizing to a venturing relationship (survival and duration) because partners each need what the other can supply, but harmful to venturing perfomance (success) because their heterogeneity exacerbates differences in how partners value their venture's activities. Results suggest that this hypothesis also cannot be rejected.

Variable Measurement and Rationale

Venture Performance

Venture performance is determined in this analysis by considering all three indicators — venture survival, duration, and sponsor-indicated assessments of success. Survival is indicated by coding whether the venture was operating in 1985, and 3.5 percent of all ventures were formed before 1975 and still operating as jointly-owned ventures in 1986. Duration is measured by the number of years between when a venture was formed and was terminated (or 1986, if the venture is still operating). Success was determined by asking the venture's sponsors. If one of the sponsoring firms did not judge the venture to be a success, it was coded as not being a mutual success. Note that if exit barriers are high, successful strategic alliances are not necessarily indicated by long-lived ventures, and short-lived ventures can be judged as successes from both sponsors' perspectives if they have achieved their strategic purpose.

Success rates. As Table 1 suggests, 45.3 percent of the ventures studied were mutually assessed to be successful by their sponsors. The greatest relative successes were enjoyed by ventures in the metals fabrication, petrochemicals, pharmaceuticals, and programming (films) industries.

Ongoing ventures. Venture survival may indicate successful performance, depending upon when the venture was created. As Table 1 suggests, 45.2 percent of the ventures studied were ongoing at the end of 1985, and 59.3 percent of those ongoing ventures were mutually judged to be successful by their sponsors (26.8 percent of total). 66.7 percent of the ventures that were not ongoing at the end of 1985 were judged to be unsuc-

Table 1: Mean Values for Entire Sample

	% Succes	% Ongoing	Years Duration	Maximum Years
Automobiles	50.1	22.7	4.2	9
CommunicationsEquipment	38.1	65.5	3.0	9
Communications Services	40.4	38.6	4.4	22
Computers & Peripherals	37.9	58.6	3.5	12
Electronic Components	32.4	16.9	2.9	6
Engines	43.2	45.9	3.6	6
Farm & Industrial Equipment	27.3	54.5	3.1	6
Financial Services	41.9	54.7	4.9	16
Heavy Machinery	33.3	23.8	7.3	20
Light Machinery	11.1	0.0	6.0	8
Medical Products	37.1	31.4	4.3	14
Metals Fabrication	62.5	50.0	6.4	14
Metals Processing	33.3	33.3	9.3	23
Mining	50.0	22.2	9.8	21
Office Equipment	38.5	15.4	7.4	26
Petrochemicals	63.9	49.3	10.3	46
Pharmaceuticals	55.9	74.2	5.0	34
Precision Controls	43.3	46.6	3.7	10
Programming (Films)	87.5	75.0	8.0	16
Programming Packaging	41.4	17.2	2.7	6
Software & Databases	40.0	44.0	3.7	11
Steel	39.4	45.5	6.1	26
Videotape Recorder & Videodisc Players	38.1	42.9	4.9	12

cessful by one or more of their sponsors (36.6 percent of total sample). The greatest proportions of ongoing ventures at the end of 1985 were found in the communications equipment, computers and peripherals, farm and industrial equipment, financial services, pharmaceuticals, and programming (film) industries.

Venture duration. The average lifespan of a venture was 3.5 years (with a standard deviation of 5.8 years). As Table 1 suggests, 42 percent of the ventures studied lasted more than 4 years, 86 percent of them lasted less than ten years, and 2.6 percent of them lasted twenty years or more. Of the ventures that were mutually assessed to be successful by their sponsors, 50 percent lasted at least four years. The longest-lived ventures were found in the metals processing, mining, programming (films), and petrochemicals industries.

6.6 percent of the ventures studied lasted one year (or less) after formation. Of the ventures that were mutually assessed to be successful by their sponsors, 4.7 percent lasted one year or less. The shortest-lived ventures were found in the communications equipment, computer and peripherals, electronic components, farm and industrial equipment, and programming packaging industries, but this result may primarily be due to their recent formation.

Partner Asymmetries

Independent variables were constructed as follows: (1) *Horizontal partners* were estimated using a dummy variable indicating whether partners were horizontally-related in a substantial portion of their products, markets, technologies, and competitve activities. (2) *Vertical partners* were estimated using a dummy variable indicating whether partners are vertically-related (that is, have a buyer-seller relationship with each other) in a substantial portion of their business activities. (3) Asymmetries in partners' *horizontal linkages* with their venture were estimated using an index, a dummy variable indicating whether parent 1 is horizontally-related to the venture. (4) Asymmetries in partners' *vertical linkages* with their venture were estimated using an index, a dummy variable indicating whether parent 1 is vertically-related to the venture multiplied by a dummy variable indicating whether parent 2 is vertically-related to the venture. (5) Asymmetries in partners' *relatedness linkages* with their venture were estimated using an index, a dummy variable indicating whether the R&D, production, or marketing activities of parent 1 are related to those of its venture multiplied by a dummy variable indicating whether the R&D, production, or marketing activities of parent 2 are related to those of its venture. (6) Asymmetries in sponsoring firm *nationalities* were estimated using an index, a dummy variable indicating whether parent 1 is a U.S. firm multiplied by a dummy variable indicating whether parent 2 is a U.S. firm. (7) Partner *size* asymmetry was estimated using the absolute value of the difference between a scaling (from 0 to 99) indicating the asset size of partner 1 and a scaling (from 0 to 99) indicating the asset size of partner 2. (8) Partners' *venturing experience* asymmetry was estimated using the absolute value of the difference between parent 1's number of cooperative arrangements and parent 2's number of cooperative arrangements.

Tables 2 and 3 show mean values by industry for the partner asymmetry variables. Analysis of the effects of industry traits on venture performance appear elsewhere (Harrigan, 1986 and 1987), and results from these other studies suggest that the performance of joint ventures (and other forms of cooperation) is more heavily influenced by their industry's structural traits than by the partnership and diversification traits examined herein.

Methodology

Information concerning sponsoring firms' relationships with each other and with their ventures was obtained in three stages: (1) construction of background papers on each industry using archival data, (2) validation using field interviews and survey questionnaires (completed in advance of the delphi interviews), and (3) a three-round delphi-method questionnaire (Harrigan, 1985; 1986; 1987). The influence of sponsoring firm asymmetries on venture performance was tested by studying 895 strategic alliances competing in 23 industries during the years 1924 to 1985. Ventures operating within the target industries were the units of analysis.[1]

Estimates of the independent and dependent variables described above were obtained and refined from interviews and questionnaires using an iterative, delphi-like procedure (Delbecq, Van de Ven, & Gustafson, 1975; Holmer, 1967; Van de Ven, 1976). Interviews, telephone conversations, follow-up letters, transcripts, and comments on preliminary drafts of each industry vignette provided revised estimates of these factors until estimates for the 895 ventures' competitive contexts were developed in a procedure described in Harrigan (1986 and 1987).

Table 4 shows the distribution of sponsoring firms' nationalities, and Table 5 shows the distribution of pairings of sponsoring firms by nationalities. Note that at least one of the sponsoring firms were based in the United States in 93.4 percent of the ventures studied

Table 2: Sponsoring Firm Differences across Industries for Strategic Alliances Affecting Commerce in the United States

	Sponsors horizontally related to each other	Sponsors vertically related to each other	Both sponsors horizontally related to venture	Both sponsors vertically related to venture	Both sponsors related to venture's activities	Both sponsors unrelated to venture's activities
Automobiles	100.0 %	0.0 %	100.0 %	0.0 %	100.0 %	0.0 %
Communications Equipment	14.6 %	30.9 %	5.5 %	9.1 %	18.2 %	14.6 %
Communications Services	21.1 %	22.8 %	19.3 %	24.6 %	26.3 %	1.8 %
Computers & Peripherals	55.2 %	31.0 %	55.2 %	6.9 %	72.4 %	1.7 %
Electronic Components	63.4 %	19.7 %	56.3 %	19.7 %	88.7 %	0.0 %
Engines	83.8 %	8.1 %	81.1 %	2.7 %	83.8 %	0.0 %
Farm & Industrial Equipment	81.8 %	9.1 %	81.8 %	0.0 %	90.9 %	0.0 %
Financial Services	32.6 %	12.8 %	34.9 %	20.9 %	69.8 %	0.0 %
Heavy Machinery	61.9 %	23.8 %	28.6 %	0.0 %	52.4 %	9.5 %
Light Machinery	66.7 %	0.0 %	66.7 %	0.0 %	66.7 %	0.0 %
Medical Products	34.3 %	8.6 %	34.3 %	0.0 %	34.3 %	11.4 %
Metals Fabrication	62.5 %	0.0 %	37.5 %	0.0 %	62.5 %	25.0 %
Metals Processing	33.3 %	22.2 %	22.2 %	0.0 %	55.6 %	33.3 %
Mining	44.4 %	11.1 %	50.0 %	0.0 %	55.6 %	22.2 %
Office Equipment	30.8 %	7.7 %	34.6 %	0.0 %	42.3 %	19,2 %
Petrochemicals	25.7 %	41.2 %	13.2 %	21.3 %	56.6 %	6.6 %
Pharmaceuticals	48.4 %	43.0 %	45.2 %	1.1 %	91.4 %	2.2 %
Precision Controls	46.7 %	33.3 %	46.7 %	0.0 %	73.3 %	26.7 %
Programming (Films)	42.9 %	42.9 %	42.9 %	0.0 %	42.9 %	0.0 %
Programming Packaging	24.1 %	44.8 %	0.0 %	62.1 %	0.0 %	3.5 %
Software & Databases	20.0 %	40.0 %	12.0 %	28.0 %	20.0 %	4.0 %
Steel	63.6 %	15.2 %	57.6 %	6.1 %	84.9 %	3.0 %
Videotape Recorders & Videodisc Players	33.3 %	33.3 %	14.3 %	47.6 %	14.3 %	19.1 %

Table 3: Substantial Differences in Partners'Asset Sizes, National Origins, and Venturing Experience Levels by Industry

	Partners Are of Significantly different Asset Sizes	Partners are both based in the United States	Partners have Significantly Different Venturing Experience Levels
Automobiles	13.6 %	0.0 %	18.2 %
Communications Equipment	16.4 %	65.5 %	34.6 %
Communications Services	5.3 %	91.2 %	17.5 %
Computers & Peripherals	27.6 %	34.5 %	36.2 %
Electronic Components	23.9 %	67.6 %	22.5 %
Engines	13.5 %	43.2 %	13.5 %
Farm & Industrial Equipment	0.0 %	18.2 %	9.1 %
Financial Services	7.0 %	62.8 %	4.6 %
Heavy Machinery	14.3 %	33.3 %	0.0 %
Light Machinery	0.0 %	100.0 %	0.0 %
Medical Products	8.6 %	62.7 %	14.3 %
Metals Fabrication	0.0 %	37.5 %	0.0 %
Metals Processing	11.1 %	33.3 %	0.0 %
Mining	11.1 %	72.2 %	0.0 %
Office Equipment	7.7 %	53.6 %	23.1 %
Petrochemicals	24.3 %	70.6 %	11.0 %
Pharmaceuticals	29.0 %	43.0 %	9.7 %
Precision Controls	23.3 %	20.0 %	40.0 %
Programming (Films)	0.0 %	71.4 %	42.9 %
Programming Packaging	20.7 %	96.6 %	6.9 %
Software & Databases	16.0 %	88.0 %	32.0 %
Steel	3.0 %	30.0 %	0.0 %
Videotape Recorders & Videodisc Players	4.8 %	47.6 %	23.8 %

*Table 4: Distribution of Sponsoring Firms' Nationality for Strategic Alliances Affecting Commerce in the United States**

Belgium	0.7 %	Korea	0.4 %
Brazil	0.1 %	Netherlands	2.5 %
Canada	1.3 %	Puerto Rico	0.1 %
Denmark	0.4 %	Saudi Arabia	1.0 %
Finland	0.1 %	Spain	0.1 %
France	4.2 %	Sweden	1.8 %
Germany	5.8 %	Switzerland	2.0 %
Honduras	0.1 %	United Kingdom	6.3 %
Italy	2.9 %	United States	93.4 %
Japan	17.0 %		

* n = 895. Two sponsors were coded for each venture. Probability that a particular nationality would be represented in a strategic alliance was calculated by summing nationalities for each sponsor and subtracting number of ventures where sponsors' nationalities were identical.

Table 5: Distribution of Sponsor Pairings by Nationality for Strategic Alliances Affecting Commerce in the United States

Belgian	with German	0.1 %	French	with Japanese	0.2 %
Belgian	with Italian	0.1 %	French	with Swedish	0.1 %
Belgian	with United States	0.5 %	French	with United States	3.0 %
Brazilian	with United States	0.1 %	German	with German	0.5 %
British	with British	0.3 %	German	with Italian	0.3 %
British	with German	0.2 %	German	with Japanese	0.3 %
British	with Italian	0.1 %	German	with Swiss	0.1 %
British	with Japanese	0.7 %	German	with United States	3.7 %
British	with Puerto Rican	0.1 %	Honduran	with United States	0.1 %
British	with Saudi	0.1 %	Italian	with Italian	0.1 %
British	with United States	4.6 %	Italian	with Japanese	0.2 %
Canadian	with Canadian	0.1 %	Italian	with Swedish	0.1 %
Canadian	with United States	0.8 %	Italian	with United States	1.8 %
Danish	with French	0.1 %	Japanese	with Japanese	0.7 %
Danish	with United States	0.3 %	Japanese	with Saudi	0.1 %
Dutch	with Dutch	0.2 %	Japanese	with Spanish	0.1 %
Dutch	with German	0.2 %	Japanese	with Swiss	0.1 %
Dutch	with United States	2.0 %	Japanese	with United States	14.4 %
Finnish	with United States	0.1 %	Korean	with United States	0,5 %
French	with British	0.1 %	Saudi	with United States	0.8 %
French	with French	0.3 %	Swedish	with United States	1.6 %
French	with German	0.2 %	Swiss	with Swiss	0.3 %
French	with Italian	0.1 %	Swiss	with United States	1.5 %
			United States	with United States	57.2 %

Both sponsoring firms were based in the United States in 57.2 percent of the ventures studied. All of the strategic alliances examined affected commerce within the United States regardless of the national origins of the venture's sponsors.

Results Concerning Diversification

Venture Performance and Related Diversification

Sponsors are related (in product, market, or technology) to their venture. Table 6 depicts the relatedness of sponsoring firms to their ventures by industry. 59.6 percent of the ventures studied were related diversifications for both of their sponsors. 51.4 percent of these related ventures were mutually assessed to be successful by their sponsors (30.6 percent of total sample). Significant differences between firms 1 and 2 in sponsor-venture relationships are reported in the section summary. The greatest proportions of ventures that were closely related to their sponsoring firms' activities were found in the automobile, computer and peripherals , electronic component, engine, farm and industrial equipment, financial services, pharmaceuticals, precision controls and robotics, and steel industries. Relatively fewer related ventures have been formed since 1974 (64.1 percent of the ventures formed before 1975 as compared with 58.6 percent of the ventures formed after 1974). And pre-1975 related ventures were more likely to be mutually judged successful than those formed after 1974 (64.3 percent versus 48.5 percent, respectively). The related diversification variable adds little predictive power in regression models of venture survival, but it is positively-signed and statistically significant in predicting venture duration and success (R-square equals .02 and .008, respectively).

Table 6: Differences in Sponsoring Firms' Product-Market Relatedness to Venture by Industr

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobiles	1.00	0.00	1.00	0.00
Communications Equipment	0.18	0.39	0.19	0.40
Communications Services	0.15	0.36	0.43	0.51
Computers & Peripherals	0.64	0.49	0.86	0.35
Electronic Components	0.85	0.36	0.96	0.21
Engines	0.71	0.46	1.00	0.00
Farm & Industrial Equipment	0.88	0.35	1.00	0.00
Financial Services	0.64	0.48	0.78	0.42
Heavy Machinery	0.43	0.51	0.71	0.49
Light Machinery	0.67	0.58	**	**
Medical Products	0.23	0.43	0.54	0.52
Metals Fabrication	0.67	0.58	0.60	0.55
Metals Processing	0.50	0.55	0.67	0.58
Mining	0.56	0.53	0.56	0.53
Office Equipment	0.44	0.51	0.40	0.52
Petrochemicals	0.35	0.48	0.69	0.47
Pharmaceuticals	0.88	0.33	0.94	0.24
Precision Controls	0.76	0.44	0.69	0.48
Programming (Films)	**	**	0.43	0.53
Programming Packaging	0.00	0.00	0.00	0.00
Software & Databases	0.20	0.41	0.20	0.42
Steel	0.90	0.31	0.77	0.44
Videotape Recorders & Videodisc Players	0.08	0.28	0.25	0.46

** Cannot be calculated

Summary. A larger percentage of strategic alliances are related to both of their sponsoring firms than are unrelated to them. Venture success rates are slightly less than proportional for the subsample that is related to both sponsoring firms. This results suggest that simply "sticking to one's knitting" alone — venturing in activities that are close to sponsoring firms' strategic cores — is not enough to ensure venture success. A larger percentage of strategic alliances that are related to both sponsoring firms were formed before 1975 and they were proportionally successful. Ventures that are related to both sponsoring firms are more likely to be judged a success by both sponsoring firms and more likely to be longer in duration than ventures with asymmetrical patterns of sponsor-venture relatedness.

Venture Performance and Horizontal Diversification

Sponsors are horizontally-related to their venture. Table 7 depicts the horizontal relatedness of sponsoring firms to their ventures by industry. 36.1 percent of the ventures studied were horizontal diversifications for both of their sponsors. 51.7 percent of these horizontally-related ventures were mutually assessed to be successful by their sponsors (18.7 percent of total sample). Significant differences between firms 1 and 2 in sponsor-venture relationships are reported in the section summary.

Table 7: Differences in Sponsoring Firms' Horizontal Relatedness to Venture by Industries

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobiles	1.00	0.00	1.00	0.00
Communications Equipment	0.09	0.29	0.00	0.00
Communications Services	0.09	0.29	0.35	0.49
Computers & Peripherals	0.47	0.51	0.68	0.48
Electronic Components	0.52	0.50	0.65	0.49
Engines	0.67	0.48	1.00	0.00
Farm & Industrial Equipment	0.75	0.46	1.00	0.00
Financial Services	0.28	0.45	0.44	0.50
Heavy Machinery	0.29	0.47	0.29	0.49
Light Machinery	0.67	0.58	**	**
Medical Products	0.23	0.43	0.54	0.52
Metals Fabrication	0.67	0.58	0.20	0.45
Metals Processing	0.00	0.00	0.67	0.58
Mining	0.44	0.53	0.56	0.53
Office Equipment	0.38	0.50	0.30	0.48
Petrochemicals	0.04	0.20	0.18	0.39
Pharmaceuticals	0.32	0.47	0.56	0.50
Precision Controls	0.35	0.49	0.62	0.51
Programming (Films)	**	**	0.43	0.53
Programming Packaging	0.00	0.00	0.00	0.00
Software & Databases	0.20	0.41	0.00	0.00
Steel	0.70	0.47	0.38	0.51
Videotape Recorders & Videodisc Players	0.08	0.28	0.25	0.46

** Cannot be calculated

The greatest propotions of ventures that were horizontally-related to their sponsors were found in the automobile, engine, and farm and industrial equipment industries.

Relatively more horizontally-related ventures have been formed since 1974 (29.4 percent of the ventures formed before 1975 as compared with 37.5 percent of the venture formed after 1974). But pre-1975 horizontally-related ventures were more likely to be mutually judged successful than those formed after 1974 (68.9 percent versus 48.9 percent, respectively). The horizontal diversification variable adds little predictive power in regression models of venture survival and duration, but it is positively-signed and statistically significant in predicting venture success (R-square equals .01).

Summary. Ventures that are horizontally-related to both sponsoring firms are more likely to be judged a success by both sponsoring firms. A larger percentage of strategic alliances that are horizontally-related to both sponsoring firms were formed after 1974 than before 1975, although venture success rates are more than proportional for both time periods.

Venture Performance and Vertical Diversification

Sponsors are vertically-related to their venture. Table 8 depicts the vertical relatedness of sponsoring firms to their ventures by industry. 13.9 percent of the ventures studied were vertical diversifications for both of their sponsors. 46.8 percent of these vertically-related ventures were mutually assessed to be successful by their sponsors (6.5 percent of total sample). Significant differences between firms 1 and 2 in sponsor-venture relationships are reported in the section summary. The greatest proportions of ventures that were verti-

Table 8: Differences in Sponsoring Firms' Vertical Relatedness to Venture by Industry

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobiles	0.00	0.00	0.00	0.00
Communications Equipment	0.05	0.24	0.14	0.36
Communications Services	0.23	0.43	0.26	0.45
Computers & Peripherals	0.05	0.23	0.09	0.29
Electronic Components	0.19	0.39	0.22	0.42
Engines	0.05	0.22	0.00	0.00
Farm & Industrial Equipment	0.00	0.00	0.00	0.00
Financial Services	0.30	0.46	0.08	0.28
Heavy Machinery	0.00	0.00	0.00	0.00
Light Machinery	0.00	0.00	**	**
Medical Products	0.00	0.00	0.00	0.00
Metals Fabrication	0.00	0.00	0.00	0.00
Metals Processing	0.00	0.00	0.00	0.00
Mining	0.00	0.00	0.00	0.00
Office Equipment	0.00	0.00	0.00	0.00
Petrochemicals	0.12	0.33	0.26	0.44
Pharmaceuticals	0.00	0.00	0.02	0.14
Precision Controls	0.00	0.00	0.00	0.00
Programming (Films)	**	**	0.00	0.00
Programming Packaging	0.53	0.51	0.75	0.45
Software & Databases	0.40	0.51	0.10	0.32
Steel	0.10	0.31	0.00	0.00
Videotape Recorders & Videodisc Players	0.38	0.51	0.63	0.52

** Cannot be calculated

caly-related to sponsoring firms were found in the communications services, financial services, petrochemicals, programming packaging, software, and videotape recorder and videodisc player industries.

Relatively fewer vertically-related ventures have been formed since 1974 (22.2 percent of the ventures formed before 1975 as compared with 12.1 percent of the ventures formed after 1974). And pre-1975 vertically-related ventures were more likely to be mutually judged successful than those formed after 1974 (50 percent versus 45.6 percent, respectively). The vertical diversification variable adds little predictive power in regression models of venture duration and success, but it is negatively-signed and statistically sig-

Table 9: Differences in Sponsoring Firms' Vertical Relatedness to Venture by Industry

	Unsuccessful		Successful	
	Mean	Std. Dev	Mean	Std Dev
Automobiles	0.00	0.00	0.00	0.00
Communications Equipment	0.21	0.41	0.05	0.22
Communications Services	0.00	0.00	0.04	0.21
Computers & Peripherals	0.03	0.17	0.00	0.00
Electronic Components	0.00	0.00	0.00	0.00
Engines	0.00	0.00	0.00	0.00
Farm & Industrial Equipment	0.00	0.00	0.00	0.00
Financial Services	0.00	0.00	0.00	0.00
Heavy Machinery	0.14	0.36	0.00	0.00
Light Machinery	0.00	0.00	**	**
Medical Products	0.18	0.39	0.00	0.00
Metals Fabrication	0.00	0.00	0.40	0.55
Metals Processing	0.50	0.55	0.00	0.00
Mining	0.33	0.50	0.11	0.33
Office Equipment	0.31	0.48	0.00	0.00
Petrochemicals	0.10	0.31	0.05	0.21
Pharmaceuticals	0.00	0.00	0.04	0.19
Precision Controls	0.35	0.49	0.15	0.38
Programming (Films)	**	**	0.00	0.00
Programming Packaging	0.06	0.24	0.00	0.00
Software & Databases	0.07	0.26	0.00	0.00
Steel	0.05	0.22	0.00	0.00
Videotape Recorders & Videodisc Players	0.31	0.48	0.00	0.00

** Cannot be calculated

nigficant in predicting venture survival (R-square equals .01). This result may be due to the larger proportion of vertically-related ventures that were formed (and subsequently terminated) early in the lives of U.S. industries to provide missing infrastructures. Similar patterns have been observed in the use of joint ventures in other newly-industrializing economies (Leff, 1978).

Summary. Ventures that are vertically-related to both sponsoring firms are less likely to be operating after 1985. Results suggest that the time when this particular form of diversification through cooperative strategy is appropriate has passed in many mature industries. A larger percentage of strategic alliances that are vertically-related to both sponsoring firms were formed before 1975 than after 1974, although venture success rates are more than proportional for both time periods.

Venture Performance and Unrelated Diversification

Sponsors are unrelated to their venture. Table 9 depicts the unrelatedness of sponsoring firms to their ventures by industry. Only 6.3 percent of the ventures studied were unrelated diversifications for both of their sponsors. 23 percent of these unrelated ventures were

mutually assessed to be successful by their sponsors (1.5 percent of total sample). Significant differences between firms 1 and 2 in sponsor-venture relationships are reported in the section summary. The greatest proportions of ventures that were unrelated to sponsoring firms were found in the communications services and equipment, petrochemicals, and precision controls and robotics industries.

Relatively fewer unrelated ventures have been formed since 1974 (9.2 percent of the ventures formed before 1975 as compared with 5.7 percent of the ventures formed after 1974). But post-1974 unrelated ventures were more likely to be mutually judged successful than those formed before 1975 (21.4 percent versus 23.8 percent, respectively). The unrelated diversification variable adds little predictive power in regression models of venture duration and survival, but it is negatively-signed and statistically significant in predicting venture success (R-spuare epuals .01).

Summary. Ventures that are unrelated to both sponsoring firms are less likely to be successful. A larger percentage of strategic alliances that are unrelated to both sponsoring firms were formed before 1975 than after 1974, although venture success rates are low for both subsamples.

Table 10: Sponsoring Firms' Horizontal Relatedness to Each Other by Industry

	Unsuccessful		Successful	
	Mean	Std. Dev	Mean	Std Dev
Automobiles	1.00	0.00	1.00	0.00
Communications Equipment	0.18	0.39	0.10	0.51
Communications Services	0.12	0.33	0.35	0.49
Computers & Peripherals	0.47	0.51	0.68	0.48
Electronic Components	0.56	0.50	0.78	0.42
Engines	0.71	0.46	1.00	0.00
Farm & Industrial Equipment	0.75	0.46	1.00	0.00
Financial Services	0.30	0.46	0.36	0.49
Heavy Machinery	0.57	0.51	0.71	0.49
Light Machinery	0.67	0.58	**	**
Medical Products	0.23	0.43	0.54	0.52
Metals Fabrication	0.67	0.58	0.60	0.55
Metals Processing	0.17	0.41	0.67	0.58
Mining	0.33	0.50	0.56	0.53
Office Equipment	0.25	0.45	0.40	0.52
Petrochemicals	0.10	0.31	0.34	0.48
Pharmaceuticals	0.32	0.47	0.62	0.49
Precision Controls	0.53	0.51	0.38	0.51
Programming (Films)	**	**	0.57	0.53
Programming Packaging	0.18	0.39	0.33	0.49
Software & Databases	0.33	0.49	0.00	0.00
Steel	0.80	0.41	0.38	0.51
Videotape Recorders & Videodisc Players	0.23	0.44	0.50	0.53

** Cannot be calculated

Results Concerning Partner Asymmetries

Venture Performance and Partner Relationships

Sponsors are horizontally-related to each other. Table 10 depicts the horizontal relationships of sponsoring firms to each other by industry. 42.2 percent of the ventures studied were formed by sponsors that were horizontally-related to each other, and 51.6 percent of those ventures between horizontally-related partners were mutually judged to be successful (21.8 percent of total). Sponsoring firms were most likely to be horizontally related to each other in the automobile, computer and peripherals, electronic component, engine, farm and industrial equipment, light and heavy machinery, metals fabrication, and steel industries.

Relatively more ventures between horizontally-related sponsors have been formed since 1974 (38.6 percent of the ventures formed before 1975 as compared with 43 percent of the ventures formed after 1974). But pre-1975 ventures between horizontally-related sponsors were more likely to be mutually judged successful than those formed after 1974 (66.1 percent versus 49.2 percent, respectively). The horizontal partners variable adds little predictive power in regression models of venture duration and survival, but it is positively-signed and statistically significant in predicting venture success (R-square equals .01).

Table 11: Sponsoring Firms' Vertical Relatedness to Each Other by Industry

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobiles	0.00	0.00	0.00	0.00
Communications Equipment	0.24	0.43	0.43	0.51
Communications Services	0.12	0.33	0.39	0.50
Computers & Peripherals	0.39	0.49	0.18	0.39
Electronic Components	0.21	0.41	0.17	0.39
Engines	0.14	0.36	0.00	0.00
Farm & Industrial Equipment	0.13	0.35	0.00	0.00
Financial Services	0.10	0.30	0.17	0.38
Heavy Machinery	0.21	0.43	0.29	0.49
Light Machinery	0.00	0.00	**	**
Medical Products	0.00	0.00	0.23	0.44
Metals Fabrication	0.00	0.00	0.00	0.00
Metals Processing	0.33	0.52	0.00	0.00
Mining	0.22	0.44	0.00	0.00
Office Equipment	0.00	0.00	0.20	0.42
Petrochemicals	0.45	0.50	0.39	0.49
Pharmaceuticals	0.56	0.50	0.33	0.47
Precision Controls	0.12	0.33	0.61	0.51
Programming (Films)	**	**	0.29	0.49
Programming Packaging	0.47	0.51	0.42	0.51
Software & Databases	0.33	0.49	0.50	0.53
Steel	0.05	0.22	0.31	0.48
Videotape Recorders & Videodisc Players	0.31	0.48	0.38	0.52

** Cannot be calculated

Sponsors are vertically-related to each other. Table 11 depicts the vertical relationships of sponsoring firms to each other by industry. 26.4 percent of the ventures studied were formed by sponsors that were vertically-related to each other, and 49.8 percent of those vertures between vertically-related partners were mutually judged to be successful (13.1 percent of sample). Sponsoring firms were most likely to be vertically-related to each other in the programming packaging, petrochemicals, pharmaceuticals, entertainment programming, and software industries.

Relatively more ventures between vertically-related sponsors have been formed since 1974 (24.8 percent of the ventures formed before 1975 as compared with 26.6 percent of the ventures formed after 1974). But pre-1975 ventures between vertically-related sponsors were more likely to be mutually judged successful than those formed after 1974 (73.7 percent versus 45.2 percent, respectively). The vertical partners variable adds little predictive power in regression models of venture duration and success, but it is positively-signed and statistically significant in predicting venture survival (R-square equals .03).

Summary. A larger percentage of strategic alliances are formed by partners that are horizontally-related to each other than are vertically-related to each other, although venture success rates are about the same for either pattern of partner relatedness. A larger percentage of strategic alliances between pairs of horizontally-related and vertically-related partners were formed after 1974, but the success rate for both types of ventures was higher before 1975. Ventures between horizontally-related partners are more likely to be judged a success by both sponsoring firms. Ventures between vertically-related partners are more likely to survive through 1985 (regardless of when they were formed).

Venture Performance and National Origins of Venture Sponsors

Partners are both U.S. firms. Table 12 depicts the proportions of partners that are based in the United States by industry. 57.1 percent of the ventures studied were sponsored by firms that were both incorporated in the United States. 41.1 percent of these U.S. sponsored ventures were mutually assessed to be successful by their sponsors (23.4 percent of total sample). U.S. sponsors were found most frequently in the communications equipment and services, electronic components, financial services, medical products, mining, programming packaging, petrochemicals, entertainment programming, and software industries. Non-U.S. sponsors were found most frequently in the automobile (primarily French, Italian, Japanese, and Swedish partners), communications equipment (primarily Canadian, Japanese, and Swedish partners), computer and peripherals (Japanese partners), engines (British and German partners), heavy machinery (German partners), metals fabrication (Japanese partners) and processing (French partners), pharmaceuticals (German, Italian, Japanese, and Swiss partners), precision controls and robotics (German, Japanese, and Swedish partners), steel (Japanese partners), and videotape recorder and videodisc player industries (British, Dutch, and Japanese partners).

95 percent of the *unsuccessful* automobile ventures had at least one non-U.S. sponsor, as did 68 percent to the *successful* automobile ventures. 47 percent of the *unsuccessful* precision controls and robotics ventures and 46 percent of the *unsuccessful* videotape recorder and videodisc player ventures had at least one non-U.S.sponsor, as did 35 percent of the *successful* precision controls and robotics ventures and 12 percent of the *successful* videotape recorder and videodisc player ventures.

56 percent of the *successful* engine ventures and 50 percent of the *successful* farm and industrial equipment ventures had non-U.S. sponsors, as did 19 percent of the *unsuccessful* engines ventures and 38 percent of the *unsuccessful* farm and industrial equipment ventures. 45 percent of the *successful* computers and peripheral equipment ventures and 26 percent of the *successful* communications equipment ventures had at least one non-U.S. sponsor, as did 36 percent of the *unsuccessful* computers and peripheral equipment ventures and 11 percent of the *unsuccessful* communications equipment ventures.

Table 12: Sponsoring Firms Are Both Based in the United States by Industry

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobiles	0.00	0.00	0.00	0.00
Communications Equipment	0.76	0.43	0.48	0.51
Communications Services	0.97	0.17	0.83	0.39
Computers & Peripherals	0.39	0.49	0.27	0.46
Electronic Components	0.73	0.45	0.57	0.51
Engines	0.67	0.48	0.13	0.34
Farm & Industrial Equipment	0.25	0.46	0.00	0.00
Financial Services	0.78	0.42	0.42	0.50
Heavy Machinery	0.21	0.43	0.57	0.53
Light Machinery	1.00	0.00	**	**
Medical Products	0.59	0.50	0.69	0.48
Metals Fabrication	0.67	0.58	0.20	0.45
Metals Processing	0.50	0.55	0.00	0.00
Mining	0.89	0.33	0.56	0.53
Office Equipment	0.69	0.48	0.30	0.48
Petrochemicals	0.63	0.49	0.75	0.44
Pharmaceuticals	0.56	0.50	0.33	0.47
Precision Controls	0.12	0.33	0.31	0.48
Programming (Films)	**	**	0.71	0.49
Programming Packaging	0.94	0.24	1.00	0.00
Software & Databases	0.80	0.41	1.00	0.00
Steel	0.30	0.47	0.54	0.36
Videotape Recorders & Videodisc Players	0.31	0.48	0.55	0.45

** Cannot be calculated

Relatively more ventures between partners of differing national origins have been formed in the United States since 1974 (30.1 percent of the ventures formed before 1975 as compared with 45.5 percent of the ventures formed after 1974). Pre-1975 ventures where both sponsors were U.S. firms were more likely to be mutually judged successful than those formed after 1974 (58.9 percent versus 36.4 percent, respectively). The national origins variable (as coded in this analysis) adds little predictive power in regression models of venture survival, but it is negatively-signed and statistically significant in predicting venture success (R-square equals .01) and positively-signed and statistically significant in predicting venture duration (R-square equals .01).

Summary. A larger percentage of strategic alliances between firms that are based in the U.S. were formed before 1975 than after 1974. More joint ventures (and other forms of cooperation) between firms of differing national origins are being formed now than in the past. This result may occur because competitive necessity forces managers to be less ethnocentric in their firms' searches for new products, customers, technologies, and resources than they once were (Harrigan, 1984). Although the Hofstede (1980) measure of cultural distance was not used in my analysis to test this hypothesis, comments from interviewed managers lead me to suspect that cultural homogeneity among sponsors is more important to venture success than symmetry in their national origins. For example, several observers noted that General Motors'values are more similar to those of its partner, Toyota, than to those of Ford Motor.

Venture Performance and Sponsors' Levels of Venturing Experience

Partners' experience levels. Table 13 depicts the proportions of partners with significantly different levels of venturing experience by industry. 35 percent of the ventures studied were formed by sponsors with about the same level of venturing experience, and 8 percent were formed by sponsors with an experience level difference of more than ten ventures. 39.5 percent of the ventures formed by sponsors with about the same level of venturing experience were mutually assessed to be successful (7.6 percent of total sample). 43.1 percent of the ventures formed by sponsors with an experience level difference of more than ten ventures were mutually assessed to be successful (3.5 percent of total sample). Significant differences between firms 1 and 2 in sponsor-venture relationships are reported in the section summary. The greatest differences in sponsors' levels of venturing experience were found in the computer and peripheral, precision controls and robotics, and software industries. Partners were most evenly matched in their venturing experience levels in the engine, farm and industrial equipment, financial services, light and heavy machinery, and medical products industries.

Table 13: Differences in Sponsoring Firms' Venturing Experience Levels by Industry

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobile	1.3	0.8	5.6	5.4
Communications Equipment	4.8	4.8	6.4	5.6
Communications Services	4.2	4.7	3.7	3.7
Computers & Peripherals	8.0	6.9	7.9	6.9
Electronic Components	5.8	4.4	4.4	3.5
Engines	4.8	6.7	2.2	3.8
Farm & Industrial Equipment	1.8	1.6	3.3	4.2
Financial Services	3.1	4.6	3.1	3.2
Heavy Machinery	1.4	2.0	0.7	1.3
Light Machinery	0.0	0.0	**	**
Medical Products	2.1	3.1	4.0	3.8
Metals Fabrication	3.3	2.5	0.8	0.8
Metals Processing	2.5	2.5	0.7	0.6
Mining	2.0	2.1	2.8	1.8
Office Equipment	4.1	5.2	3.5	3.6
Petrochemicals	3.3	2.9	2.9	2.9
Pharmaceuticals	2.9	2.7	4.0	3.1
Precision Controls	5.6	7.0	7.8	5.3
Programming (Films)	**	**	6.1	2.3
Programming Packaging	4.1	4.1	3.3	1.7
Software & Databases	4.8	6.4	7.7	7.4
Steel	2.0	1.6	1.7	0.9
Videotape Recorders & Videodisc Players	6.2	5.7	3.6	2.1

** Cannot be calculated

Relatively fewer ventures between partners with the same level of venturing experience have been formed since 1974 (24.2 percent of the ventures formed before 1975 as compared with 18.2 percent of the ventures formed after 1974). Pre-1975 ventures between sponsors of similar venturing experience were more likely to be mutually judged successful than those formed after 1974 (43.2 percent versus 38.5 percent, respectively). Relatively more ventures between partners with vastly different levels of venturing experience have been formed since 1974 (2 percent of the ventures formed before 1975 as compared with 9.3 percent of the ventures formed after 1974). The finding that pre-1975 ventures between sponsors of vastly different venturing experience were less likely to be mutually judged successful than those formed after 1974 (33.3 percent versus 43.5 percent, respectively) suggests that experienced partners are now more willing to help their less experienced counterparts learn to use strategic alliances effectively. The venturing experience variable adds little predictive power in regression models of venture success, but it is negatively-signed and statistically significant in prediting venture duration (R-square equals .02) and positively-signed and statistically significant in predicting venture survival (R-square equals .01).

Table 14: Differences in Sponsoring Firms' Asset Sizes by Industry

	Unsuccessful		Successful	
	Mean	Std Dev	Mean	Std Dev
Automobile	15.9	10.4	20.9	19.1
Communications Equipment	21.8	15.9	24.0	13.0
Communications Services	19.7	12.7	10.0	8.5
Computers & Peripherals	29.0	13.5	22.0	17.3
Electronic Components	23.9	16.0	21.7	17.4
Engines	23.8	18.6	11.6	8.9
Farm & Industrial Equipment	13.8	6.9	21.7	5.8
Financial Services	14.9	11.7	16.9	13.4
Heavy Machinery	20.4	14.5	22.1	16.3
Light Machinery	8.3	2.9	**	**
Medical Products	21.4	16.3	19.6	10.3
Metals Fabrication	16.7	10.4	8.0	6.7
Metals Processing	23.3	19.9	8.3	5.8
Mining	18.3	14.0	10.6	7.3
Office Equipment	23.8	13.2	9.5	8.0
Petrochemicals	27.2	19.6	20.5	17.3
Pharmaceuticals	31.2	17.6	25.1	15.9
Precision Controls	14.4	11.7	39.2	23.3
Programming (Films)	**	**	7.9	7.0
Programming Packaging	26.8	18.3	7.1	5.0
Software & Databases	20.3	16.7	22.0	14.6
Steel	13.5	10.8	15.0	10.0
Videotape Recorders & Videodisc Players	16.9	12.0	11.9	8.8

** Cannot be calculated

Summary. Most of the ventures formed in recent years were between partners with dissimilar venturing experience levels and the impact of such dissimilarity on venture success is negative (although *not* statistically significant). A larger percentage of strategic alliances formed by partners with similar experience level were formed before 1975 than after 1974, although venture success rates are more than proportional for both time periods.

Venture Performance and Sponsors' Relative Asset Sizes

Partners' asset sizes. Table 14 depicts the proportions of partners with significantly different asset sizes. Differences in sponsoring firms' asset sizes were scaled (through arithmetic transformation) from 0 to 99. 24.6 percent of the ventures studied were formed by partners of similar asset size. Only 2 percent of the ventures studied were formed by partners with asset size differences that were coded at the very high end of the scale. 52.7 percent of the ventures formed between partners of similar asset sizes were mutually judged to be successful by their sponsors (13 percent of total sample). The greatest differences in sponsors' asset sizes were found in the electronic component, computer and peripherals, pharmaceuticals, and precision controls and robotics industries.

Relatively fewer ventures between partners of the same asset size have been formed since 1974 (30.1 percent of the ventures formed before 1975 as compared with 23.5 percent of the ventures formed after 1974). Pre-1975 ventures between sponsors of similar asset size are more likely to be mutually judged successful than those formed after 1974 (67.4 percent versus 48.9 percent, respectively). Relatively more ventures between partners with vastly different asset size have been formed since 1974 (1 percent of the ventures formed before 1975 as compared with 2 percent of the ventures formed after 1974). The asset size variable adds weak predictive power in regression models of venture survival, duration or success (because coefficient values in all cases are close to zero and R-square equals .02, .01, and .01, respectuvely).

Summary. More ventures are being formed now by partners of different asset sizes than in the past. A larger percentage of strategic alliances formed by sponsoring firms of similar asset sizes were formed before 1975 than after 1974, although venture success rates are more than proportional for both time periods.

Conclusions

Results suggest that ventures are more successful where partners are related (in products, markets, and/or technologies) to their ventures or horizontally-related to them than when they are vertically-related or unrelated to their ventures. Results suggest that ventures last longer between partners of similar cultures, asset sizes and venturing experience levels. Also, results suggest that ventures last longer when ventures' activites are related (in products, markets, and/or technologies) to both of its sponsors.

Given the great disparity in means (and standard deviations) by industry shown in Tables 1 through 14, it appears that partners' traits and sponsor-venture relationship traits do not offer much explanatory power in models of venture survival, duration, and success. These results are consistant with Harrigan's (1986 and 1987) finding that partners' and sponsor-venture traits are less important in determining which cooperative strategy to embrace than industry traits are. They suggest that venturing firms should worry *less* about their partners' traits and *more* about the competitive needs that their ventures are intended to address when their managers use strategic alliances.

Footnote

1 The sample industries included automobiles (3.5% of sample), communications equipment (3.9%), communications services (7.2%), computers & peripherals (4.9%), electronic components (12.1%), engines (4.1%), farm & industrial equipment (1.0%), financial services (8.0%), heavy machinery (3.3%), light machinery (0.6%), medical products (4.9%), metals fabrication (0.8%), metals processing (1.2%), mining (2.9%), office equipment (4.5%), petro-chemicals (14.2%), pharmaceuticals (4.9%), precision controls (3.3%), programming (films) (0.4%), programming packaging (4.9%), software & databasis (2.9%), steel (3.7%), and videotape recorders & videodisc players (2.5%).

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