University of Navarra

Working Paper
WP-189
May, 1990

AN INTERNATIONAL COMPARISON OF NEW VENTURES

Robert H. Keeley
Juan B. Roure
Mitsuyoshi Goto
Koji Yoshimura

IESE Business School – University of Navarra
Avda. Pearson, 21 – 08034 Barcelona, Spain. Tel.: (+34) 93 253 42 00 Fax: (+34) 93 253 43 43
Camino del Cerro del Águila, 3 (Ctra. de Castilla, km 5,180) – 28023 Madrid, Spain. Tel.: (+34) 91 357 08 09 Fax: (+34) 91 357 29 13

Copyright © 1990 IESE Business School.

AN INTERNATIONAL COMPARISON OF NEW VENTURES

Robert H. Keeley[1]
Juan B. Roure[2]
Mitsuyoshi Goto[3]
Koji Yoshimura[4]

Abstract

This study compares 127 new ventures from four European countries, Japan and the United States. All received financing from large venture capital firms. Data from the original business plans, as well as financial histories, provide a view of international differences in founding management teams, industry choices and business strategies. The United States sample is large enough to divide into two groups, which helps illustrate the changes over time in new venture structure, and the relationship of those changes to performance. The data from the business plans have a strong ability to "explain" performance, using multiple regression models. The relationships vary by country and over time.

[1] Professor, Stanford University
[2] Professor, Entrepreneurship, IESE
[3] Professor, Shibaura Institute of Technology
[4] Professor, Niigata Sangyo University

AN INTERNATIONAL COMPARISON OF NEW VENTURES

1. Introduction

The potential for entrepreneurial companies to contribute to economic growth and technological progress in both developed and developing nations has been increasingly recognized in the 1980s. An important issue is to identify the criteria for success in a new venture, and to understand whether those criteria are "transportable" across national and regional boundaries.

To prepare this study, the authors have compiled data on 127 new ventures from four European countries, Japan and the United States. All received funding from venture capitalists who made the original business plans available to the authors. In addition to financial information, the database contains descriptions of the founding managers, the industries they entered, and their business strategies. The archival sources and non-judgmental measures offer advantages in validity, interpretation and replication, allowing easy application of our results to other situations.

The next section briefly reviews earlier single country studies. Section three briefly describes the venture capital industries in each region. With this background, section four describes the sample of new ventures, reporting the individual measures in some detail. Section five analyzes the influence of the companies' initial attributes on their subsequent success or failure.

Single Country Studies of New Ventures

In the 1980s, researchers formed the view that a new venture's performance resulted from its choice of industry, its business strategy, and the abilities of its founders (Maidique and Roure, 1986; Stuart and Abetti, 1987; Sandberg and Hofer, 1987; Van Ven, Hudson and Schroeder, 1984). Several empirical studies have been done (e.g. Eisenhardt and Schoonhoven, 1989; Keeley and Roure, 1990; MacMillan and Day, 1987, in addition to the aforementioned citations). They vary considerably as to samples, measures, methods and results, but in all cases they use (or attempt to reconstruct) attributes of the firm and its industry at the firm's inception to try to predict performance. Taken together, they show an influence of the industry selected, the initial business strategy and the characteristics of the founders. However, the results often

account for a small part of a company's performance, and the variation in approaches makes direct comparison among studies difficult.

Venture Capital in Europe, Japan and the United States

Table 1 summarizes the recent histories of venture capital in Europe, Japan and the United States. The United States' industry is older, having emerged in the 1960s. After a period of rapid expansion from 1978 to 1984, its activity has declined somewhat. In Europe and Japan, venture capital became a recognizable industry in the early 1980s, with investment levels (as a fraction of GNP) about 25% of that in the United States. Since then their paths diverged widely, as Table 1 illustrates. An additional difference, not shown in the Table 1, is that Japanese venture capitalists fund very few start-ups. They attribute their reluctance to the lack of a public market for successful young companies. They note that of 35 initial public offerings in 1988 by smaller companies, the average age was 21 years.

Sources of venture capital investment data do not use identical industry categories across the three regions. Table 2 attempts to allocate overall investment to industries along roughly comparable categories. It indicates that U.S. venture capitalists concentrate much more on technology-based companies than do their Europe and Japanese counterparts. The European and Japanese mixes of industries appear similar.

Table 1

Venture Capital Activity in Europe, Japan and the United States

			1988 Investments		
	Growth Rate (1983-88)[2] %/yr.	Index of Activity[1] (U.S.=100)	($,million)	Number	Ave. Size ($,000)
Europe-Total	52.3	162	4,303	5078	847
Lowest (Germany)	37.1	12	147	224	656
Highest (U.K.)	51.2	632	2,934	2,104	1,394
Japan[3]	(3.6)	25	290	634	457
U.S.	(2.8)	100	3000	1,827	1,64

Notes:
Sources: European Venture Capital Association (1989), Venture Enterprise Center 1989), *Venture Capital Journal* (1989).

[1] Index is 1988 Investment by venture capital firms divided by GNP. The U.S. value of 0.0617% is scaled to 100.
[2] The European base for calculating growth is actually the 1981-1984 average from Tyebjee and Vickery (1989).
[3] Excludes loans by Japanese venture capital firms. These numbered 75 in 1988 and totaled $15,670 million. They appear to be low-risk loans to established, young companies.

A Multi-country Sample of New Ventures

The sample for this study consists of 127 new companies. Sixty-eight are from the United States. They have been previously described in Keeley and Roure (1989), and were collected by the authors from four cooperating venture capital funds. Thirty-eight were provided by six European venture capital firms. Twenty-one were provided by four Japanese venture capitalists. In all cases, the start-up companies represent a block of contiguous investments within the

venture capitalist's portfolio. This helps prevent selection biases. All of the venture capital firms are leaders in their respective regions, and the sample of start-ups matches the industry composition of Table 2 reasonably well (note that the U.S. sample is from an earlier period, when venture capitalists concentrated even more heavily on technology-based industries).

The United States' sample is divided into two groups of 34, depending on whether the date of the start-up financing was before October 1981 or not. This date is the approximate mid-point of a period when the number of start-ups per year roughly tripled. The environment seems to have been dramatically different between the two periods. Thus the division of the U.S. sample provides an analysis of intertemporal change, while the European and Japanese samples allow an international comparison.

Table 2

Distribution of Venture Capital Investments in 1988 by Industrial Sector

	Europe[1]	U.S.		Japan[2]
Electronic	15	47	Electrical Machines & Software	24
Medical/Bio	5	21		
Industrial Prod & Manufacturing	24	4	Gen. Machines + Other Mfg. + Info. & Services	18
Automation	2	1	Precision Machines	6
Other Services	7	n/a	Sales, Dist. & Trading	14
Consumer	24	13		
Foreign	3		Foreign	8
Other	20	14	Other	29

Notes:
Sources: European Venture Capital Association (1989), Venture Enterprise Center 1989), *Venture Capital Journal* (1989).

[1] "Foreign" has been taken from sectors on a pro rata basis for Europe.
[2] Japan refers to fund balances, not to investment flows, because investment was not available.

This study uses the variables and analytical framework of our previous studies. The variables were initially developed by Maidique and Roure (1986), and have been augmented by those used in Sandberg and Hofer (1987). In addition data on managerial experience, as suggested in Keck and Tushman (1988), were collected. The variables represent a compromise between those one might ideally desire and those which are universally available in business plans. They are described in Appendix A, and the rationale for each is discussed in references cited there.

Tables 3 through 6 compare the four sub-samples. If a variable does not show a statistically significant difference ($p<0.10$) across the four sub-samples, only the overall mean and standard deviation is shown (for binary variables only the mean is shown since the standard deviation is a simple function of the mean and the sample size). If the mean or standard deviation varies across the sub-samples, it is shown for all four groups.

Table 3 summarizes the financing data. The European and Japanese start-ups began two years on average after the second U.S. sample. In part because of this they have been in the investor portfolios an average of about 2.7 years compared to more than 4 years for the U.S. companies. In all four sub-samples the number of financing rounds averages about one per year. A comparison with Table 1 shows that the U.S and European financings in this sample are above the region averages, but the Japanese financings are close to the Japan average.

Table 3

Financing and Performance Comparison[1]

		MEAN VALUE (STD. DEV.)				
		TOTAL	U.S.		EUROPE	JAPAN
			Pre-82	82-84		
	Units	(N=127)	(N=34)	(N=34)	(N=38)	(N=21)
Ave. Start Date	mo/yr	1/83	3/80	1/83	3/85	4/85
Fdr. Investment	($,000)	172	102	82	129	416
		(309)	(160)	(93)	(129)	(499)
Amt of First Fin.	($,000)	1,517	1,199	2,416	1,528	554
		(2,329)	(1,184)	(1,844)	(3,561)	(524)
Time in Portfolio	yrs.	3.7	4.9	4.1	2.7	2.8
		(1.9)	(2.2)	(1.0)	(0.8)	(1.9)
Rounds of Fin.	#	3.6	5.3	4.1	2.2	2.4
		(2.0)	(1.8)	(1.7)	(1.3)	(1.4)
Is Company Public?	# yes	22	13	8	1	0
Last Price/First	#	7.5	18.62	6.5	1.4	2.1
		(16.8)	(25.9)	(15.6)	(3.3)	(2.0)
IRR-A1l $[2]	%/yr	43.6	101.2	44.1	-5.6	38.4
		(124.7)	(172)	(102)	(73.6)	(106.9)
IRR to Investors[2]	%/yr	22.5	74.7	18.2	-24.1	29.6
		(102.1)	(144)	(74.5)	(73.6)	(106.8)

Notes:

[1] If TOTAL only is shown; variable (Mean or Std. Dev. as appropriate) is not statistically different across groups ($p<0.10$).

[2] Portfolio return will be higher than average IRR.

Japanese founders invest much more than their American or European counterparts, averaging over $400,000. Japanese venture capitalists indicate that they would not feel comfortable investing otherwise. This eliminates would-be entrepreneurs, who lack personal wealth, and probably restricts the number of new ventures.

Performance varies dramatically among the four groups. The pre-1982 American sample has by far the best performance, with an average multiple on the founding investment of 18.6, and correspondingly high rates of return. The risk is also very high. The standard deviation on the return to investors, at 144% per year, is about five times the standard deviation of a typical large public company. The returns are considerably lower for the U.S. firms started in 1982-1984 and for Japanese start-ups, and lower yet for the European firms.

The sample of European investments has not performed as well as the U.S. or Japanese samples. However, the reader should not be misled by the negative average IRR to investors. This does not mean they are losing money on their portfolios, because the positive deviations more than offset the negative ones. The average multiplier is perhaps the best indicator and it is up 40%.

Table 4

Comparison of Managerial Characteristics

		MEAN VALUE (STD. DEV.)				
		TOTAL	U.S.		EUROPE	JAPAN
			Pre-82	82-84		
	Units	(N=127)	(N=34)	(N=34)	(N=38)	(N=21)
Team Completeness	%	60.9	69.7	68.7	52.2	49.0
		(23.8)	(21.4)	(25.4)	(20.1)	(22.0)
Similar Experience	%	66.3	83.3	72.1	66.6	27.0
		(33.3)				
High Growth Exper.	%	54.4	83.6	66.8	34.3	22.0
		(40.0)				
Joint Experience	%	37.4	51.9	37.9	26.6	32.5
		(27.7)	(28.9)	(29.1)	(19.3)	(27.9)
Average Experience yrs.		13.6	13.9	15.0	14.9	6.8
		(5.6)	(4.2)	(4.7)	(6.2)	(3.6)
Std. Dev. of Fdr. Exp. yrs.		3.6	3.4	4.2	4.3	1.2
		(3.3)	(2.6)	(2.6)	(4.3)	(1.6)
Coeff. of Var. of Exp.	#	0.26				
		(0.21)	(0.17)	(0.16)	(0.26)	(0.22)
Co. Ave. Exp.> 10 yr?	yes=1	0.73	0.82	0.86	0.74	0.23
Jt. Exp. > 50 &	yes=1	0.18	0.21	0.32	0.10	0
# Fdr. > 2 & Std. Dev. of Fdr. Exp > 3						

Note: If TOTAL only is shown, variable (Mean or Std. Dev. as appropriate) is not statistically different across groups (p<0.10).

Table 5

Comparison of Industry Characteristics

		MEAN VALUE (STD. DEV.)				
		TOTAL	U.S.		EUROPE	JAPAN
			Pre-82	82-84		
	Units	(N=127)	(N=34)	(N=34)	(N=38)	(N=21)
Stage	1-5	2.53				
		(0.96)	(0.86)	(0.70)	(1.3)	(0.75)
Competition	1-5	3.23				
		(1.30)				
Growth	%/yr.	35.8				
		(27.3)				
Future Barriers	1-5	2.78				
		(0.90)	(0.78)	(0.73)	(1.07)	(0.97)
Buyer Concentration	1-5	3.42	3.26	3.08	3.89	3.33
		(1.37)				
Segmented by- geo.	%	13	0	0	26	29
-prod. features		42	26	32	47	71
-customer groups		29	32	9	37	43
Industry Group						
Computer/Software	%	31	35	50	21	10
Other Electronic	%	31	41	44	19	18
Bio/Medical	%	12	15	3	21	5
Other	%	26	9	3	39	67

Note: If TOTAL only is shown; variable (Mean or Std. Dev. as appropriate) is not statistically different across groups ($p<0.10$).

Turning to managerial characteristics, Table 4 summarizes the four groups. The most striking difference among them is the relative lack of experience of the Japanese founders. This is reflected in fewer years of experience, in a smaller age percentage of founders who have held positions similar to the ones assumed in the new company, and in a smaller age percentage with experience in high growth companies. The founding teams of the European and American companies are quite similar, although the Americans tend to have more complete teams at the outset and have more experience in high growth companies.

Table 5 describes the characteristics of the industries that the new companies entered. The American companies are heavily concentrated in technology companies, whereas two thirds of the Japanese companies are in "Other" and were exclusively non-technical. The 15 European companies in "Other" were also exclusively non-technical. Despite the differences in industry composition, many of the remaining characteristics are similar, including the stage of the market (not yet mature); the amount of competition (moderate); the growth rate of the market (high); the expected ease of future entry (moderate, at least a few additional competitors are expected); and buyer concentration (moderate, between 30 and 100 on average). They suggest that market opportunities may occur in different industries across the regions, but that on several measures of attractiveness they are much alike.

The American companies enter segmented markets least frequently, and none enter a geographically segmented market (for the Americans this refers to geographical segmentation within the United States). The Japanese are much more likely to enter a segmented market,

which, coupled with their lower funding levels, suggests they are pursuing narrower opportunities.

The difference in industry choice is reflected in some of the strategy measures shown in Table 6. The Japanese and European firms are more likely to use strategies beyond simply building a better product. Particularly prevalent are geographic extension strategies, and strategies predicated on a sponsor. The Europeans also plan to innovate through the development of new marketing channels in almost half the cases. They and the Japanese are more likely than the Americans to view themselves as entering a new market segment, often with a new product. The Americans are more likely to enter an existing market with a product which is imitative, but significantly better.

Overall, one has the impression that the Americans enter relatively broad, technology-based markets with strategies based on having a better product and highly experienced founding teams.

Table 6

Comparison of Strategy Characteristics

		MEAN VALUE (STD. DEV.)				
		TOTAL	U.S.		EUROPE	JAPAN
			Pre-82	82-84		
	Units	(N=127)	(N=34)	(N=34)	(N=38)	(N=21)
Prod.Superiority	1-5	3.31				
		(1.16)				
New vs. Imitative	% new	54	38	50	61	76
New Market?	% new	51	23	35	74	81
New Prod.& New Mkt?	% yes	39	18	35	45	71
Development Time	months	10.8	11.4	13.5	10.8	5.5
		(7.0)	(5.7)	(6.9)	(8.1)	(4.0)
Plan Detail	1-5	3.1	3.3	2.9	3.3	2.5
		(1.2)				
Projected Mkt. Share	%	16.8				
		(20.9)	(16.8)	(14.6)	(27.8)	(21.1)
Entry Wedges	#/co.	1.05	0.50	0.68	1.74	1.29
		(1.17)	(0.66)	(0.81)	(1.35)	(1.31)
Second Source	%	13				
Cust/Suppl.Sponsor	%	24	6	18	34	43
Govt. Regs.	%	10	3	0	23	14
Supply Shortage	%	16				
New Mkt. Channel	%	26	15	21	45	19
Geographic Ext.	%	17	0	0	45	24

Notes:

[1] Variables which are repressors in equations 1 and 2 are identified as X1, X2, etc.
[2] If TOTAL only is shown, variable (Mean or Std. Dev. as appropriate) is not statistically different across groups ($p<0.10$).

The Japanese are more likely to emphasize niches in non-technical markets with a product or service tailored to that niche. Their founders are often less experienced and their founding teams somewhat smaller, which is consistent with a smaller planned scale of operation and more modest growth aspirations.

The Europeans are a mixture of both. They have relatively experienced founders and a high level of initial funding, but they are much less likely than the Americans to enter a global, technology-based industry. Instead, they place more emphasis on marketing innovations such as geographic extension.

Although the above three paragraphs may describe central tendencies of the samples, Tables 3 through 6 make clear that each sub-sample has substantial variation, and each region has companies which match the averages of another area.

Performance as a Function of Management, Industry and Strategy

The variables showed in Tables 3 through 7 and described in Appendix A all have a theoretical basis for influencing performance. However, some will prove more important in practice, and variations will occur by country because of industry and strategy differences. Changing financial and industrial market conditions may also affect how the variables influence performance.

Rather than apply a single form to all four sub-samples, we decided to perform separate regressions for each of the four. These are shown in Table 7. In addition, we present an extra regression for the pre-1982 United States sample using returns based on a complete financial history instead of just the return on the first round of financing. This provides a better fit, and two variables – "Team Completeness" and "Buyer Concentration" – drop below a 10% significance level when the first round return is used – as it must be for the European and Japanese sub-samples. This suggests that better results would be obtained if complete financial histories were available for Europe and Japan.

The results are generally strong, with adjusted R2 between 0.37 and 0.79. All show an influence of managerial and industry variables. The pre-82 U.S. sample and the European sample show an influence of strategy variables as well. Most variables are in the expected directions, although there are some surprises. For example, teams with average experience above 10 years performed worse by a sizeable margin in both U.S. samples. In addition, teams with more variation in years of experience performed worse in the European sample (the coefficient was negative but not significant in the other sub-samples). In both cases, further study is required to determine whether the phenomenon is generally true and why.

The results show that the choice of industry often affects either the intercept or the slope of a given variable, with the "Other" industry ("Other" is non-technical; all other industries are technical) as the most common influence. The European and U.S. samples are relatively easy to interpret. The Japanese is more difficult. The early U.S. sample shows a positive influence for managerial experience; cf. Keeley and Roure, 1989) represents a time of increased competition, especially among start-ups. The results suggest that the computer industry had become relatively less attractive, and that growth markets were no longer advantageous. The implication is that better opportunities were to be found in the less popular markets.

Table 7

Regressions of Performance on Managerial, Industry and Strategy Variables

	Coefficient (t Statistic)				
		U.S.		EUROPE	JAPAN
	Pre-82 Complete Hist	Pre-82 (N=28)	82-84 (N=28)	(N=30)	(N=19)
Managerial Variables					
Completeness	1.97	1.40			
	(1.81+)	(1.22)			
Completeness if Industry="Other"					
4.18					
					(3.70**)
Similar Experience				0.76	
				(2.56*)	
Ave. Experience>10yr.?	-122.88	-72.88	-145.27		
	(2.58*)	(1.44)	(3.45**)		
Std. Dev. of Team Experience				-6,56	
				(2.78**)	
Industry Characteristics					
Buyer Concentration	248.77	210.31	178.52		
Buyer Concentration Squared	-43.62	-36.97	-30.53		
	(3.94*)	(2.52)	(6.19**)		
Competition					-58.04
					(5.22***)
Stage = Growth?	179.18	162.65			
	(4.86***)	(4.15***)			
Stage=Growth & Industry="Other"?				66.93	
				(1.99*)	
Industry="Other"?					-305,2
					(4.52***)
Industry="Computer"?			-55,14		
			(1.84+)		
Strategy Variables					
Product Superiority	48.85	61.99			
	(2.42*)	(2.89**)			
Sponsor & Industry="Other"?				-96,9	
				(2.72**)	
Technical Adjustments					
Time in Portfolio	-25.78	-27.54			
	(2.99**)	(3.03**)			
Public?			67,38		
			(2.02+)		
Venture Capitalist = 7?					162.91
					(5.21***)
Intercept	-401.85	-380.67	-1.10	-1.56	227.85
	(2.38*)	(2.12*)	(0.01)	(0.07)	(5.07***)
Adjusted R2	0.79***	0.72***	0.53***	0.37**	0.79***
Degrees of Freedom	20	20	21	25	14

Notes:
[1] "Complete Hist." means that IRR is based on the complete financing history and not just on the first round. Complete histories are not available for Europe and Japan. Based on U.S. calculations, the goodness of fit is diminished as shown in the first two columns. Some otherwise significant variables lose their significance.
[2] Buyer concentration is a quadratic expression. An F test is used to test both variables together and is shown instead of a t statistics.
[3] Statements such as Industry ="Other"? refer to a dummy variable which is 1 when the industry is "Other." In some cases, these are multiplied by other variables to create an influence which applies only to a specific industry.
[4] An alternative to "Completeness" in the first two columns, which is equally significant, is a dummy variable which is 1 if the founding team has more than two members, if joint experience is over 50 %, and if Std. Dev. of team member experience is over three years.
[5] Significance is $p<0.10$ +; $p<0.05$ *; $p<0.01$ **; $p<0.001$ ***.
[6] Certain variables have missing data. The sample sizes refer to the number of cases with the all required data.

The European sample suggests that the growth stage of a market was attractive in non-technical industries, but that the entry strategy should be broad and not tied to a sponsor.

The Japanese results indicate that non-technical investments are losers (combining the intercept and the Industry as "Other," dummy variable produces an 80% annual loss) unless the completeness of the team or low competition come to the rescue. Additionally, investments of one fund (designated venture capitalist=7) show much higher returns than the others. That fund had two of its five investments from the "Other" category. On the whole, technical investments are the better performers in Japan, even though they are only 33% of the sample, and non-technical investments are better performers in Europe.

Concluding Comments

This paper compares representative sets of start-up companies from countries whose venture capital activities vary widely. The general view that performance is related to the founders' characteristics, the industry chosen and the business strategy is supported. Linear regressions can "explain" much of the variation in performance, which shows that performance generally stems from systematic forces which researchers have previously identified.

However, the specific forms of the regressions vary from one region to another, as well as changing over time in the United States. Thus, they are not useful for true predictions of performance. With more detailed study of some of the companies in the sample, we hope to understand why the regressions vary, and move toward a general explanation of the performance of new companies.

References

Eisenhardt, K. E. and C. B. Schoonhoven (1989), "Organizational growth: Linking founding team, strategy, environment and growth among U.S. semiconductor ventures (1978-1988)," Working paper, Stanford University.

EVCA Secretariat (1989), "Venture capital in Europe: 1989 kEVCA yearbook," European Venture Capital Association, Zaventum, N.V.

Keck, S. and M. Tushman (1988), "A longitudinal study of the change in group demographics," Proceedings of the annual meeting of the American academy of management, pp. 175-179.

Keeley, R. H. and J. B. Roure (1989), "Determinants of new venture success before 1982 and after: A preliminary look at two eras," Presented at the Babson college entrepreneurship research conference.

MacMillan, I. C. and D. L. Day (1987), "Corporate ventures into industrial markets: Dynamics of aggressive entry," Jo*urnal of Business Venturing*, Vol. 2, No 1, pp. 29-39.

Roure, J. B. and R. H. Keeley (1990), "Predictors of success in new technology based ventures," *Journal of Business Venturing* (forthcoming).

Roure, J. B. and M. A. Maidique (1986), "Linking prefunding factors and high-technology venture success: An exploratory study," *Journal of Business Venturing*, Vol. 1, No 3, pp. 295-306.

Sandberg, W. A. and C. W. Hofer (1987), "Improving new venture performance: the role of strategy, industry structure and the entrepreneur," *Journal of Business Venturing*, Vol. 2, No 1, pp. 5-28.

Stuart, R. and P. A. Abetti (1987), "Start-up ventures: towards the prediction of initial success," *Journal of Business Venturing*, Vol. 2, No 3, pp. 215-229.

Tyebjee, T. and L. Vickery (1988), "Venture capital in Western Europe," *Journal of Business Venturing*, Vol. 3, No 2, pp. 123-136.

Van de Ven, A. H., R. Hudson, and D. M. Schroeder (1984), "Designing new business start ups: entrepreneurial, organizational, and ecological considerations," *Journal of Management*, Vol. 10, No 1, pp. 87-101.

Venture Capital Journal, Special report, "Venture capital disbursements decline 21% to $3 billion in 1988," June 1989, pp. 10-19.

Venture Enterprise Center (1989), "Promotion of venture businesses and the venture capital industry," Venture Enterprise Center, Tokyo.

Appendix A

Description of Variables[2]

Financing Information

- Dates of start-up financing and of last financing.
- Time interval between start-up financing and last financing; Amount invested by founders at start-up.
- Amount invested by venture capitalists at start-up.
- Number of financing rounds.
- Internal rate of return earned by start-up investors and the rate earned by founders and investors combined.
- Multiples of price and of investment between the start-up financing and the last financing.

Management Team Variables

- Similar experience: The percentage of founders1 with experience in a position similar to the one to be assumed.
- High growth experience: The percentage of founders[1] with experience in rapidly growing (over 25% annual growth in sales) companies.
- Team completeness: The percentage of key positions which were filled at the time of the first major (over $300,000) outside funding. Key positions are the president and functional managers for marketing, engineering, operations, finance (or a second technical manager in place of one of the latter two if the venture involved two technologies, such as electronic and mechanical design). This measures variation in founders' backgrounds, as well as overall organization strength.
- Prior joint experience: This reflects the extent to which founders1 had previously worked in the same organization for at least six months. Several measures were tested; the one used here considers the leader (usually the CEO) and the three other founders with the greatest joint experience. For each, prior relation between the leader and another founder a value of 20 is given. For each prior relationship among the three other founders a value of 10 is given. The combination produces a range of 90 points which is arbitrarily set from 10 to 100.
- Years of work experience: Collected for each founder (if available). Average experience was calculated, as well as three measures of variation in experience: the standard deviation, the maximum difference, and the coefficient of variation. Two dummy variables were constructed from these. One indicated average experience greater than ten years. The other (used in Eisenhardt and Schoonhoven, 1990) requires joint experience above 50%, at least three founders, and a standard deviation in years of experience greater than 3. Studies have theorized that variation in experience increases a firm's adaptability, and therefore its performance.
- Founders' Equity Share: the share of the company retained by the founders[1] after the first financing.

Industry Characteristics

- Industry Category: Eight categories are used: computer systems, computer hardware, communication equipment, semiconductors, other electronic equipment, software, bio/medical products, other.
- Competitor strength: Assessed on a 5 point scale (using information in the business plans).

  1=No existing competition.
  2=One competitor exists, or a few may enter.
  3=A few (2-4) competitors exist, but are either small or not attentive to the market niche.
  4=Several small, or a few large, competitors exist, but no clear leader has emerged.
  5=Several companies are serving the market and a clear leader exists.

- Buyer concentration: A measure of the number of potential customers in the target market during the first two years of sales. It is rated on a five-point scale.

  5=Very low concentration (over 300 customers).
  4=Low concentration (100 to 300 customers).
  3=Medium concentration (30 to 99 customers).
  2=High concentration (10 to 29 customers).
  1=Very high concentration (less than 10 customers).

- Market Stage: A measure of the market's state of organization and growth.

1=Pre-commercial. If products are being sold, volumes are low.
2=Developmental. Variety of offerings has increased. Sales growing.
3=Growth. Standards are emerging. Market growing at >15%/yr. Sale exceed several million dollars per year.
4=Shakeout. Growth slowing. Exodus of several competitors.
5=Maturity. Growth has slowed to under 10%/yr. Products stable.
6=Decline. Sales declining. Little product innovation.

- Growth: The anticipated growth rate of the market over the next few years.
- Future Barriers[2]: May influence the attractiveness of current entry.

  1=None. Expect many new competitors over the next 5 years.
  2=Limited. Expect several new competitors over the next 5 years.
  3=Significant. Expect a few new competitors.
  4=Strong. Expect only one or two new competitors.
  5=Very strong. Expect no new competitors.

- Segmentation[2] (Several of the following may apply):

  a. None
  b. Geographically
  c. By product features/prices
  d. By customer groups (including captive customers)

Strategy Variables

- Quality of the technical development plan: The technical plan is selected as a variable rather than the business plan because almost every firm in this sample has a complete, high quality business plan. The approach to technical development plans varies considerably, allowing the following measures:

  1=No mention of how the venture will develop its technology.
  2=General statement how the technology will be developed without milestones or schedules.
  3=Milestones, schedules and tasks are described in a general way.
  4=A detailed development program has quarterly schedules with an outline of the more important tasks.
  5=A monthly development program includes details of important tasks.

- Product development time: the number of months from the initiation of development to the initial sale as forecast in the business plan.
- Product superiority=: Measured on a five-point scale:

  1=A product's benefits match those of its competitors or potential substitutes.
  2=A product incorporates minor improvements.
  3=It incorporates significant improvements in performance.
  4=It represents a major improvement.
  5=It will clearly be the industry leader.

- Forecast market share in the fifth year: an indirect measure of the aggressiveness of the company's plan.
- New (first entry) vs. Imitative (Follower) Product[2]
- New vs. Established Market (Segment)[2]
- Entry "Wedges"[2] (which of the following special conditions apply?):

  e. Company will be a second source
  f. A large customer (or supplier) is sponsoring the company
  g. A shift has occurred in the regulatory climate
  h. A shortage of supply exists
  i. The company will exploit a new marketing channel

Notes:

[1] Founders are those employees, who, as indicated by the business plan, are expected: 1) to play a key role in the development of the firm, 2) to become employees of the company within the first year after the initial funding date, and 3) to share in the ownership of the company in a significant manner.
[2] Variables designed with a superscript 2 are discussed in Sandberg and Hofer (1987). All others are discussed in Roure and Keeley (1990), except for the experience variables which are discussed in sources cited under the description of the variable.