Chapter V

Results

This chapter reports the results of the data analysis. The analysis was four-fold. First, variables of partner attributes, relationship attributes, and knowledge attributes were verified to answer research question one. In the same part, a univariate examination of variables was performed and the descriptive statistics of all variables were reported. Second, bivariate correlations of all variables were examined. Next, a series of ANOVA was performed. Finally, multiple regression analyses and a multiple discriminant analysis were conducted to test hypotheses.

Variables and Descriptive statistics

This section presents the verification of all variables in the full model of the study. It is to identify what variables constitute attributes of partner firms, relationships, and knowledge in international alliances in Thailand. Descriptive statistics are reported in the adjacent part.

Partner Attributes

To identify constructs of partner attributes, firstly, bivariate correlations were evaluated by using Kendall's Tau-b. Table 5.1 indicated that there were average correlations between items within the same set of measure at the .01 significance level. Correlations between items within the same set of measure were stronger than those between different sets. Secondly, raw data of all items which were retained after the reliability and validity tests were forced into a principal components analysis. The analysis, as shown in Table 5.2, revealed five factors. Every item strongly loaded in its respective factor except cultural similarity loaded on the same factor with trust.

Statistically, cultural similarity should have been disregarded from further analysis for three reasons. First, in comparison, trust was more important than cultural similarity because the former contained higher factor loadings than the latter. Factor

loadings are the correlation of each variable and the factor, with higher loadings making the variable representative of the factor and more important to the factor (Hair, Anderson, Tatham, and Black, 1995: 380). To reassure the result, I had put all items of trust and cultural similarity into the same principal components analysis. The communality extraction revealed value of .393 and .485 for the two statements of cultural similarity, indicating their relative lower level of explanation within the same factor than those of trust. Second, the Cronbach's alphas in the reliability tests in chapter four showed that trust was more reliable than cultural similarity. Third, all items of the two measures significantly had average correlations among them which might cause a problem of multicollinearity. The impact of multicollinearity is to reduce any individual independent variable's prediction power by the extent to which it is associated with the other independent variable. It implied that in a multivariate context, cultural similarity was not needed if trust had been employed. Cultural similarity was redundant and should be eliminated to avoid multicollinearity.

However, cultural similarity was not excluded from the analysis since it still tapped my interest. The problem of multicollinearity consequently was carefully examined in the subsequent analysis. Therefore, in this study, partner attributes contain characteristics of cultural similarity, trust, and receptivity. To obtain a composite score, cultural similarity was the mean score of compatible procedures and compatible philosophy in business dealings. Trust was the mean score of partner firm's characteristics of being responsible, qualified, frank, and thoughtful. Receptivity was classified into three dimensions, i.e., capability, knowledge cultivating activities, and firm's strength. 'Capability' was the average score of information management and information integration. 'Knowledge cultivating activities' was the mean score of in-house training, outside training, and firm's memo. 'Firm's strength' was the mean score of financial strength, regulation knowledge, human resource, technology development, and plant capacity. Although the components analysis revealed two-factor solution in evaluating items in firm's strength, these items were combined so that receptivity was not too fractured. In addition, these items presented significant levels of correlation among them whereas the reliability test of all indicators also indicated an acceptable Cronbach's alpha.

Table 5.1 Correlations of Partner Attributes Variables

Correlations

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Compatible procedures	1.000															
Compatible philosophy	.489**	1.000														
information management	-.032	.138	1.000													
information integration	.087	.114	.630**	1.000												
inhouse training	.192*	.077	.108	.003	1.000											
outside training	.118	.020	-.009	-.053	.560**	1.000										
firm memo	.144	-.029	.067	.003	.521**	.406**	1.000									
financial strength	.155	.127	.104	.101	.188*	.192*	.105	1.000								
regulation knowledge	-.032	.070	.086	.161	.067	.175*	.015	.355**	1.000							
recruitment	.050	.137	.040	.014	.200*	.247**	.089	.367**	.443**	1.000						
tech development	.003	.165	.190*	.024	.093	.019	-.010	.301**	.115	.200*	1.000					
quality control skill	.155	.137	.053	.070	.168	.103	-.010	.352**	.279**	.322**	.503**	1.000				
responsible	.210*	.376**	.272**	.194*	.199*	.100	.099	.023	.057	-.057	.122	.021	1.000			
qualified	.234*	.221*	.285**	.236*	.129	.091	-.001	-.025	.204*	.089	-.012	-.064	.492**	1.000		
frank	.227*	.335**	.281**	.253**	.170	.182*	.185*	.134	.158	.009	.145	.045	.678**	.398**	1.000	
thoughtful	.312**	.368**	.246**	.200*	.101	.154	.056	.017	.069	.038	.190*	.083	.592**	.463**	.654**	1.000

**. Correlation is significant at the .01 level (2-tailed).

*. Correlation is significant at the .05 level (2-tailed).

Table 5.2 Principal Components Analysis of Partner Attributes Variables

Component	1	2	3	4	5
Compatible procedures	**0.690**	0.081	0.019	-0.253	0.100
Compatible philosophy	**0.734**	-0.088	0.183	-0.094	0.166
Information management	0.140	0.091	0.005	**0.880**	0.126
Information integration	0.154	-0.051	0.125	**0.821**	0.042
In-house training	0.098	**0.865**	0.085	0.020	0.128
Outside training	0.099	**0.801**	0.223	-0.058	0.008
Firm memo	0.057	**0.801**	-0.055	0.072	-0.044
Financial strength	0.050	0.128	**0.543**	0.030	0.496
Regulation knowledge	0.104	-0.006	**0.859**	0.123	0.068
Human resource	-0.005	0.171	**0.818**	0.005	0.158
Technology development	0.091	-0.006	0.008	0.158	**0.862**
Plant capacity	0.029	0.042	0.321	-0.008	**0.753**
Responsible	**0.815**	0.093	-0.064	0.250	0.018
Qualified	**0.674**	0.025	0.164	0.287	-0.247
Frank	**0.783**	0.172	0.041	0.229	0.017
Thoughtful	**0.782**	0.103	-0.074	0.188	0.073
Total Variance Explained					
Initial Eigenvalues	4.163	2.452	1.889	1.474	1.107
% of Variance	26.016	15.324	11.804	9.212	6.916
Cumulative %	26.016	41.340	53.144	62.356	**69.273**

Descriptive statistics of all constructs of partner attributes are provided as follows.

Cultural Similarity

Respondents were asked to indicate the degree of similarity of their partner's organizational culture to that of their company. Table 5.3 indicates that on an average, local firms tended to agree that they and their foreign partner had similar culture in terms of compatible organizational procedures and compatible philosophies and approaches to business dealings, with the mean values of 3.75 and 3.81, respectively.

Table 5.3 Respondents' View on Cultural Similarity

Indicators	Mean	S.D.
1. Compatible organizational procedures	3.75	.62
2. Compatible philosophies and approaches to business dealings	3.81	.64

Receptivity

Receptivity of the local firm was focused on three dimensions, i.e., local firm's capability, local firm's strength, and local firm's knowledge cultivating activities. Table 5.4, Table 5.5, and Table 5.6 report the descriptive statistics of these three dimensions, respectively.

Firm's capability

Table 5.4 indicates that, on an average, local firms are receptive to new knowledge when they are measured by the capability to manage new knowledge and the capability to incorporate new information, with the mean values of 3.55 and 3.61, respectively.

Table 5.4 Respondents' View on Firm's Capability

Items	Mean	S.D.
1. Information management capability	3.55	.59
2. Information integration capability	3.61	.62

Firm's Strength

Table 5.5 shows that , on an average, the strength of every resource to acquire or utilize new knowledge of local firms is above the middle level. The strength of plant capacity and quality control was the highest, with the mean value of 3.70. The strength of financial resource was the lowest, with the mean value of 3.11.

Table 5.5 Respondents' View on Firm's Strength

Items	Mean	S. D.
1. Financial resource	3.11	0.89
2. Regulations and government relations	3.58	0.83
3. Recruitment and human resource development	3.33	0.69
4. Production technology development	3.34	0.72
5. Plant capacity and quality control	3.70	0.64

Firm's knowledge cultivating activities

Table 5.6 indicates that, on an average, local firms educate their employees by every means. Company's memo was the most frequently used, ranging from seven to twelve times in a year, with the mean value of 3.28.

Table 5.6 Respondents' View on Firm's Knowledge Cultivating Activities

Items	Mean	S. D.
1. In-house training courses	2.52	0.94
2. Outside-training course	2.48	0.83
3. Company's memo	3.28	0.89

Trust

Trust was focused on the dimensions of benevolence and credibility. Table 5.7 shows that, on an average, local firms trust in their foreign partners' capability and competency more than trust in the characteristics of being thoughtful, responsible, and frank, as shown by the mean values of 4.10, 3.68, 3.67, and 3.51, respectively.

Table 5.7 Respondents' View on Trust

Items	Mean	S.D.
1. Responsible	3.67	.79
2. Qualified (Capable and competent)	4.10	.71
3. Frank	3.51	.73
4. Thoughtful	3.68	.73

Relationship Attributes

Relationship attributes contain three characteristics, i.e., ownership structure, partner complementarity, and prior tie. Correlations between variables were investigated. Table 5.8 shows that there is no statistically significant linear relationship among these three variables. The principal component analysis was not applicable since the visual inspection revealed no substantial number of correlations greater than .30 (Hair, Anderson, Tatham, and Black, 1995: 374). Descriptive statistics of all variables were reported as follows.

Table 5.8 Correlations of Relationship Attributes Variables

Variables	1	2	3
1. Ownership structure	1.000		
2. Prior tie	-.024	1.000	
3. Complementarity	-.028	.010	1.000

Ownership Structure

Respondents were asked to identify the type of the alliance on which they concentrated in answering the questionnaire for this study. Table 5.9 indicates that 47.1 percent of the alliances were those of dominant local partner; 17.6 percent were those of dominant foreign partner; 23.5 percent were only contract based alliances, and 11.8 percent were non-contract based alliances.

Table 5.9 Ownership Structure of the Alliances

(N=102)

Ownership structure	Count	Percent
1. Equity based		
• Dominant local partner	48	47.1
• Dominant foreign partner	18	17.6
2. Non equity based		
• Contracted	24	23.5
• Not contracted	12	11.8

Complementarity

Respondents were asked to inform types of resources that they and their foreign partners contributed to the alliance. The contributions were investigated in terms of the scope of unique contributions from each partner and the extent of the total contributions between partner. Table 5.10 indicates that, on an average, the scope of unique resources contribution between partners into the alliance was 71.70 percent of the contributions. The extent of the balanced contributions between both partners, on an average, was 72.18 percent of the contributions. As a combination of scope and extent of contributions, on an average, the complementarity between partner was 71.94 percent of the contributions.

Table 5.10 Characteristics of Partners' Complementarity

(N=102)

Characteristics	Mean	S.D.
Complementarity	71.94	12.91
• Contributions by scope	71.70	23.69
• Contributions by extent	72.18	23.42

Prior Tie

Respondents were asked to identify whether their company had participated in any alliance or other business with this foreign partner. Table 5.11 indicates that the number of local firms that had participated in one type or two types of business relationships with their focal foreign partners before entering the focal alliance were 48 percent and 30.4 percent, respectively. Twenty two local firms or 21.6 percent of respondents had no previous tie with this foreign partner.

Table 5.11 Characteristics of Partners' Prior Tie

(N=102)

Characteristics	Count	Frequency (%)
Prior tie classified by amount of type:		
• none	22	21.6
• 1 type	49	48
• two types	31	30.4

Knowledge Attributes

To identify variables in the knowledge attributes, correlations between items were evaluated by using Kendall's Tau-b. A principal components analysis of the raw data of all retained items was performed. Table 5.12 shows that indicators of ambiguity have high correlations among them at the .01 significant level. Indicators of trialability had low correlations to each other, but were significant at the .01 level. Indicators of usage advantage had middle to high correlations among them at the .01 significant level. Correlations across the set of variables were low. The principal components analysis in Table 5.13 revealed three factors as expected. Every indicator had a significant loading to its respective factor. Therefore, knowledge attributes contain three characteristics of knowledge, i.e., ambiguity, trialability, and usage advantage.

Table 5.12 Correlations of Knowledge Attributes Variables

	1	2	3	4	5	6	7	8
Transferability	1.000							
Clear linkage	0.660**	1.000						
Unable to be written	0.458**	0.485**	1.000					
Working procedure	-0.115	-0.119	-0.139	1.000				
Partner's supervision	-0.168	-0.217*	-0.188*	0.277**	1.000			
Profitable	-0.143	-0.205*	-0.094	0.116	0.184*	1.000		
Efficiency creation	0.022	-0.057	0.001	0.105	0.220*	0.421**	1.000	
Accredit	-0.046	-0.061	-0.099	0.120	0.092	0.395**	0.683**	1.000

** Correlation is significant at the .01 level (2-tailed).

* Correlation is significant at the .05 level (2-tailed).

Table 5.13 Principal Components Analysis of Knowledge Attributes Variables

Component	1	2	3
Transferability	**0.897**	-0.006	-0.083
Clear linkage	**0.893**	-0.085	-0.097
Unable to be written	**0.846**	-0.049	-0.057
Working procedure set up	-0.020	-0.029	**0.867**
Partner's supervision	-0.169	0.154	**0.809**
Profitable	-0.153	**0.726**	0.031
Efficiency creation	0.026	**0.894**	0.110
Accredit	0.005	**0.865**	0.008
Total Variance Explained			
Initial Eigenvalues	2.661	1.973	1.283
% of Variance	33.258	24.668	16.032
Cumulative %	33.258	57.926	**73.957**

Descriptive statistics of knowledge attributes are as follows.

Ambiguity

Respondents were asked to indicate the degree to which the knowledge of their partner was ambiguous to them. Table 5.14 indicates that, on an average, local firms disagreed that the technology of their partner was ambiguous,either in terms of its transferability, clear causal linkage, or the ability to be incorporated into a written form, as shown by the mean values of 2.59, 2.51, and 2.47, respectively.

Table 5.14 Respondents' View on Knowledge Ambiguity

Items	Mean	S.D.
1. Transferability. (R)	2.59	.81
2. Clear linkage (R)	2.51	.81
3. Cannot be written	2.47	.97

(R) = reverse coded.

Trialability

Table 5.15 shows that, on an average, local firms agreed that the technology from their partner had the characteristics of trialability. Local firms were able to set up working procedure and had tested the technology of their partner within an appropriate time under their partner's supervision before the actual application was started, as shown by the mean values of 3.84 and 3.79, respectively.

Table 5.15 Respondents' View on Knowledge Trialability

Items	Mean	S.D.
1. Able to set up working procedure	3.84	.54
2. Test technology before actual application	3.79	.67

Usage Advantage

Respondents were asked to evaluate whether the knowledge from their partner was advantageous. Table 5.16 shows that, on an average, local firms agreed that the technology of their partner was advantageous in terms of the ability to advance and accredit their production process, the ability to improve the efficiency of their production process, and the appropriateness of cost and benefit, with the mean values of 4.01, 3.93, and 3.74, respectively.

Table 5.16 Respondents' View on Knowledge Usage Advantage

Items	Mean	S.D.
1. Profitable	3.74	.67
2. Efficiency creation	3.93	.60
3. Accredit the firm's technology.	4.01	.54

Local Firm's Learning

Local firm's learning is the dependent variable of this study. Learning is multidimensional. To reassure the appropriateness of the classification of these dimensions, every indicator of learning was put into a principal components analysis with varimax rotation method. The analysis yielded a three-factor solution as was presented in Table 5.17. The first factor was the overall learning. The second factor was the productivity improvement. The third factor was the combination of partner's technology utilization, new product design, and standard development. I decided to divide the third factor into two measures according to the nature of the indicators. These two measures were labeled as innovation (i.e., new product design and standard development) and innovation adoption (i.e., technology utilization). For subsequent analyses and hypotheses testing, overall learning was the composite mean score of overall learning 5-item statement measure. Productivity improvement was the composite mean score of productivity improvement 5-item measure. Innovation was

the mean value of new product design and standard development. Innovation adoption or partner's technology utilization was a single categorical measure.

Table 5.17 Principal Components Analysis of Learning

Component	Overall learning	Productivity improvement	Other learning
Production efficiency improvement	**0.79723**	0.17337	0.01545
Production technology improvement	**0.76956**	0.15245	0.24883
Change in manufacturing	**0.78709**	0.21286	0.15685
Change in understanding	**0.72617**	0.0839	0.07032
Better work environment	**0.702**	-0.0006	0.25503
Defective rate improvement	0.1495	**0.85258**	-0.0727
Improved rate of return product	0.17769	**0.82771**	-0.1229
Improved machine's utilization	0.07249	**0.69626**	0.38297
Improved rate of r&d	0.05115	**0.61461**	0.50636
Improved man-hour productivity	0.20051	**0.66122**	0.42538
New design development	0.31731	0.10494	**0.67775**
Standards development	0.10213	-0.0513	**0.67494**
Partner's technology utilization	0.17185	0.39896	**0.5631**
Total Variance Explained			
Initial Eigenvalues	4.87248	1.98051	1.24042
% of Variance	37.4806	15.2347	9.54172
Cumulative %	37.4806	52.7154	**62.2571**

The four measures of learning were used as a dependent variable in separate analysis. Overall learning, productivity improvement, and innovation were analyzed by using ordinary least square (OLS) multiple regression analyses. A series of ANOVA was also performed to test the effects of independent variables on these three measures of learning. Innovation adoption was analyzed by using a multiple discriminant analysis. Innovation adoption is a categorical dependent variable therefore, the multiple discriminant analysis is the appropriate analytical technique.

Regarding the innovation adoption, responses varied markedly between groups. According to Hair, Anderson, Tatham, and Black (1995: 195), each group should practically have at least twenty observations and should not vary markedly. Otherwise, the estimation of the discriminant functions and the classification of

observations will be impacted. Therefore, respondents were divided into three groups instead of five. These three groups were divided as those firms whose their partner's technology was utilized in one to twenty percent, twenty one to forty percent, and forty one percent or more of their production process.

The results of the analyses were presented in the next section. Descriptive statistics of learning are as follows.

Overall Learning

Table 5.18 shows that, on an average, local firms agreed that there was improvements in their company after entering the alliance in terms of the production process efficiency, production technology, work environment, manufacturing and conducts, and understanding, with the mean values of 3.97, 3.89, 3.88, 3.82, and 3.72, respectively.

Table 5.18 Respondents' View on Overall Learning

Items	Mean	S. D.
1. Production efficiency improvement	3.97	.69
2. Production technology improvement	3.89	.64
3. Change in manufacturing and conducts	3.82	.72
4. Change in understanding	3.72	.67
5. Better work environment	3.88	.75

Productivity Improvement

Table 5.19 indicates that, on an average, local firms had improved their productivity approximately one percent to twenty percent each year after entering the alliance. The improvement was on defective rate, machine's capacity utilization, man-hour productivity, product returned for repair, and number of R&D projects, with the mean values of 1.08, 1.03, 0.94, 0.94, and 0.84, respectively. Ranging from zero to four, the highest level of improvement was on defective rate and the lowest was on the number of R&D projects.

Table 5.19 Characteristics of Local Firm's Productivity Improvement

(N=102)

	Mean	S.D.
1. Defective rate improvement	1.08	0.94
2. Rate of product returned improvement	0.94	1.18
3. Machine's capacity utilization improvement	1.03	1.09
4. Number of R&D projects improvement	0.84	1.02
5. Production per man-hour improvement	0.94	0.91

New Product Design, Standard Development, and Technology Utilization

Table 5.20 indicates that, after entering the alliance, 27.5 percent of local firms had not developed any new product design at all whereas 72.5 percent of local firms had developed some new product designs. Regarding the standard development, 31.4 percent of local firms had never been awarded any certifications of standards whereas 68.6 percent of local firms had received one type to three types of certification of standard. Regarding the utilization of partner's technology, most local firms utilized 41% or more of it in their production process.

Table 5.20 Respondents' View on New Product Design, Standard Development, and Partner's Technology Utilization

(N=102)

Indicators	Percent
New product design	
• Not at all	27.5
• 1-3 design(s)	34.3
• 4-6 designs	16.7
• 7 or above	21.6
Number of standards awarded by a firm	
• 0 type	31.4
• 1 type	20.6
• 2 types	25.5
• 3 types or more	22.6
Utilization of foreign partner's technology and know-how	
• 1-10 %	10.8
• 11-20%	15.7
• 21-30%	22.5
• 31-40%	13.7
• 41% or above	37.3

Table 5.21 Descriptive Statistics and Correlations Matrix

Variables	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.Overall learning	3.859	0.548	1.000														
2.Productivity	1.916	0.699	0.337**	1.000													
3.Innovation	1.358	0.924	0.339**	0.255**	1.000												
4.Innovation adoption	3.510	1.405	0.266**	0.392**	0.309**	1.000											
5.Cultural similarity	3.775	0.579	0.154*	0.053	0.133	0.021	1.000										
6.Capability	3.578	0.548	0.246**	0.078	0.133	0.129	0.122	1.000									
7.Cultivating	1.761	0.742	0.139*	0.147	0.311**	0.060	0.148*	0.031	1.000								
8.Firm's strength	3.412	0.533	0.173*	0.053	0.152*	0.062	0.119	0.096	0.107	1.000							
9.Trust	3.738	0.623	0.345**	0.279**	0.239**	0.222**	0.349**	0.294**	0.164*	0.068	1.000						
10.Ownership structure	0.647	0.480	0.202*	0.154	0.237**	0.286**	0.162*	0.045	0.225**	0.172*	0.177*	1.000					
11.Prior tie	1.088	0.719	0.085	0.122	0.148*	0.162*	0.059	0.063	0.063	0.041	0.104	-0.018	1.000				
12.Complementarity	71.942	12.91	-0.054	-0.064	-0.089	0.096	0.063	0.124	-0.070	0.056	0.062	-0.032	-0.016	1.000			
13.Ambiguity	2.523	0.763	-0.151*	-0.042	-0.022	-0.070	-0.132	0.024	0.047	-0.162*	-0.051	-0.043	-0.054	0.060	1.000		
14.Trialability	3.819	0.511	0.226**	0.092	0.102	0.118	0.230**	0.110	0.075	0.158*	0.169*	0.051	0.087	0.128	-0.241**	1.000	
15.Usage advantage	3.892	0.501	0.399**	0.360**	0.200**	0.342**	0.185*	0.168*	-0.023	0.169*	0.446**	0.082	0.132	-0.017	-0.081	0.226**	1.000

**Correlation is significant at the 0.01 level (1-tailed).
*Correlation is significant at the 0.05 level (1-tailed).

Bivariate analysis

The associations between variables were measured by using four approaches. First, the one-tailed Kendall's tau-b was used to determine the strength of relationship of variables. Secondly, a series of ANOVA was conducted to test the effect of each independent variable on three dimensions of learning. The effect of independent variables on innovation adoption was not tested because the scale of measurement of the dependent variable was not appropriate to be analyzed by this method. Third, multiple regression analyses were used to examine the relationships between independent variables and three dimensions of learning. Three models were specified. Overall learning was the dependent variable in model one. Productivity improvement was the dependent variable in model two. Innovation was the dependent variable in model three. Lastly, the multiple discriminant analysis was used to examine the relationship between innovation adoption and its independent variables.

Kendall's tau Correlations

Table 5.21shows the means, standard deviations, and correlation matrix for all the variables. The standard deviations for all variables indicated a fair amount of variance in the responses. All means indicated the positive sides of the responses, except that of ambiguity. The correlation matrix was used to examine the collinearity between independent variables as well as the correlation between dependent variable and independent variables. The absolute values of the correlation among independent variables (number 5 to 15) range from 0. 017 to 0. 446 indicated that multicollinearity was not problematic in subsequent analysis.

The correlation matrix also indicated that overall learning was significantly correlated with cultural similarity, all three dimensions of receptivity, trust, ownership structure, ambiguity, trialability, and usage advantage. Productivity improvement was significantly correlated with trust and usage advantage. Innovation was significantly correlated with two dimensions of receptivity (knowledge cultivating activities and firm's strength), trust, ownership structure, prior tie, and usage advantage. Innovation

adoption was significantly correlated with trust, ownership structure, prior tie, and usage advantage.

Analysis of Variance (ANOVA)

A series of one-way ANOVA was used to test the effect of independent variables on three measures of learning, i.e., overall learning, productivity improvement, and innovation. Variable 'type of industry' was added in the analysis to examine if there was any differences in learning between the two industries, i.e., vehicles and parts industry and electronics and electrical products and parts industry. Nine companies which had been categorized as 'both industries' were divided and added into the two industries.

All independent variables were recoded as binary variables. Responses with the score below three for cultural similarity, capability, firm's strength, trust, ambiguity, trialability, and usage advantage were categorized as the low group, otherwise was the high group to the respective variables. Responses with the score of zero for prior tie and ownership structure were categorized as the low group, otherwise was the high group. Responses with the score below the mean value for complementarity were categorized as the low group, otherwise was the high group. Responses with the score below two for knowledge cultivating activities were categorized as the low group, otherwise was the high group.

The homogeneity of the variance of the dependent variable between groups was assessed by using the Levene statistic. The test indicated no differences of the variance except when productivity improvement was defined by knowledge cultivating activities and complementarity and when innovation was defined by usage advantage. In general, the unequal cell sizes should not impact the sensitivity of the statistical tests of group differences.

Table 5.22, Table 5.23, and Table 5.24 indicated that, at the significance level 0.05, the null hypothesis that the type of industry had no impact on the three measures of learning could not be rejected.

Results of the tests in Table 5.22 suggested that the different levels of trust, ownership structure, trialability, and usage advantage resulted in the significant difference in the overall learning of local firms. The effect of these independent variables on overall learning was positive. The mean values indicated that the low group achieved lower level of overall learning than the high group.

Table 5. 22 Results of ANOVA of Overall Learning

Variables	Mean		Sig.
	Low	High	
Cultural similarity	3.74	3.92	0.12
Capability	3.72	3.93	0.08
Strength	3.71	3.90	0.15
Knowledge cultivating	3.87	3.86	0.94
Trust	3.34	3.94	0.00
Ownership structure	3.69	3.95	0.02
Prior tie	3.88	3.85	0.83
Complementarity	3.85	3.89	0.82
Ambiguity	3.89	3.68	0.15
Trialability	3.53	3.89	0.03
Usage advantage	2.97	3.94	0.00
Industry	3.88 (v)	3.84 (e)	0.68

Results in Table 5.23 suggested that the different levels of knowledge cultivating activities and usage advantage resulted in the significant difference in the productivity improvement of local firms. The effects of these independent variables on productivity improvement were positive. The mean values indicated that the low group achieved lower level of productivity improvement than the high group.

Table 5.23 Results of ANOVA of Productivity Improvement

Variables	Mean		Sig.
	Low	High	
Cultural similarity	0.86	0.95	0.52
Capability	0.82	0.96	0.36
Strength	0.88	0.93	0.77
Knowledge cultivating	0.64	1.00	0.03
Trust	0.57	0.97	0.046
Ownership structure	0.78	0.99	0.14
Prior tie	0.88	0.93	0.79
Complementarity	0.89	0.99	0.54
Ambiguity	0.89	1.01	0.54
Trialability	0.84	0.93	0.69
Usage advantage	0.31	0.97	0.006
Industry	0.97 (v)	0.86 (e)	0.40

Results in Table 5.24 suggested that the different levels of knowledge cultivating activities and ownership structure resulted in the significant difference in innovation of local firms. The effects of these independent variables on the innovation of local firms were positive. The mean values indicated that the low group achieved lower level of innovation than the high group.

Table 5.24 Results of ANOVA of Innovation

Variables	Mean		Sig
	Low	high	
Cultural similarity	1.18	1.46	0.15
Capability	1.29	1.39	0.59
Strength	1.11	1.43	0.14
Knowledge cultivating	0.88	1.51	0.003
Trust	1.29	1.37	0.76
Ownership structure	1.01	1.55	0.005
Prior tie	1.23	1.39	0.46
Complementarity	1.39	1.25	0.47
Ambiguity	1.32	1.56	0.33
Trialability	1.18	1.38	0.51
Usage advantage	1.11	1.38	0.40
Industry	1.43 (v)	1.28 (e)	0.41

Multiple Regression Analysis

There are three models for the analysis. An Ordinary Least Squares (OLS) multiple regression analysis was conducted separately for each model. The regression was run on all of the hypothesized independent variables by the stepwise method. Overall learning was the dependent variable in model 1. Productivity improvement was the dependent variable in model 2. Innovation, which was the composite variable of new design and standards development, was the dependent variable in model 3.

Variables examination

Before running the multiple regression, the distribution of all variables was examined. Productivity improvement had positive-skewed distribution, hence, was transformed by using the square-root to achieve a closer approximation to normality. The regression model of productivity improvement, then, was estimated twice. At the first estimation, the original value was used. Trust and usage advantage entered the model. At the second estimation , the original value was substituted by the transformed value. Only usage advantage entered the model. All other predictor variables showed non-significant levels for entry but trust was significant at the 0.10 level. The coefficient for usage advantage was slightly weaker in the second estimation (0.374 versus 0.329). Results of the R^2 value were almost identical (0.173 versus 0.171). The remedies for violating the assumption of normality did not improve the prediction, meanwhile, altered the findings. Therefore, I decided to use the original value of productivity improvement.

Multicollinearity among variables was examined by using the variance inflation factor (VIF). The VIF is the method of detecting the severity of multicollinearity by looking at the extent to which a given explanatory variable can be explained by all the other explanatory variables in the equation (Studenmund, 1992: 274). A high VIF indicates that multicollinearity has increased the estimated variance of the estimated coefficient, yielding a decreased t-score. The higher the VIF, the more severe the effects of multicollinearity. Studenmund (1992: 275) suggests a common rule of thumb that if VIF > 5, the multicollinearity is severe. Likewise, Hair, Anderson, Tatham, annd Black (1995: 127) suggest the cutoff threshold of VIF values above 10. The analyses of the three models revealed that the VIF for every variable in no case exceeded 5. The VIF values are reported in Table 5.25.

Evaluation for the Assumptions in Multiple Regression Analysis

The assumptions underlying multiple regression analysis, about the linearity of the phenomenon measured, the homoscedasticity of the error term, and the normality

of the error term distribution (Hair, Anderson, Tatham, and Black, 1995: 111), were assessed.

The linearity of the relationship between dependent and independent variables represents the degree to which the change in the dependent variable associated with the predictor variable is constant across the range of values for the independent variable. The linearity of the relationship between dependent and independents in each model was assessed by using studentized residual plots approach which is the most widely used (Hair, Anderson, Tatham, and Black, 1995:111). From the studentized residuals plots, no nonlinear pattern was exhibited in all three models, thus, ensuring that the models were linear.

The homoscedasticity is defined when the variance of the error terms appears constant over a range of predictor variables. When the error terms have increasing or modulating variance, the data are said to be heteroscedastic. There is no universally agreed-upon method of testing for heteroscedasticity (Studenmund, 1992: 376). Following Tabachnick and Fidell (1989), heteroscedasticity causes OLS to underestimate the variances of the coefficients. However, the analysis is weakened but not invalidated. In this study, the homoscedasticity was diagnosed by using studentized residuals plots (Hair, Anderson, Tatham, and Black, 1995:142). The studentized residuals plots showed no pattern of increasing or decreasing residuals in every model; thus, indicated homoscedasticity in the multivariate case.

The normality of the error term distribution was assessed by using histograms and normal probability plots as suggested by Hair, Anderson, Tatham, and Black (1995: 114). The histogram of residuals is the simplest diagnostic for the set of predictor variables in the equation, providing a visual check for a distribution approximating the normal distribution. For the normal probability plots, if a distribution is normal, the residual line closely follows the diagonal which is made by the normal distribution. With a visual examination of the normal probability plots and the histograms of the residuals, the regression variates were found to meet the assumption of normality for model 1 and model 3. The values fell along the diagonal in the normal probability plots, thus, the residuals were considered to represent a normal distribution. Tests of normality found violation of the assumption in model 2

since the dependent variable violated the assumption of normality and the remedy was decided not to be conducted.

Validation of the Model and the Overall Model Fit

Table 5.25 shows results of the multiple regression analyses of the three models. The estimation of the signs, the coefficient of determination, the standard error of the estimate, and the regression coefficients were performed.

The goodness-of-fit of the model was assessed by the coefficient of determination (R^2). R^2 indicates the percentage of total variation of dependent variable explained by independent variables and the overall degree of fit of an equation. F-test was used to test the hypothesis that R^2 was greater than zero and to provide a formal hypothesis test of the level of significance of that overall fit. The null hypothesis is R^2 is equal zero. If the calculated F-ratio was greater than the critical F-value, the hypothesis would be rejected.

Standard error of the estimate (SEE) represents an estimate of the standard deviation of the actual dependent values around the regression line. It is a measure to assess the absolute size of the prediction error.

The regression coefficients were also tested if they differed significantly from zero. This is not a test of any exact value of the coefficient but rather of whether it should be used at all. The t-test was used. The statistical test of the regression coefficients was to ensure that across all the possible samples that could be drawn, the regression coefficient should be different from zero (Hair, Anderson, Tatham, and Black, 1995: 120).

Table 5.25 Results of Regression Analyses

Variables	Overall learning			Productivity improvement			Innovation		
	B	t-value	VIF	B	t-value	VIF	B	t-value	VIF
Cultural similarity	0.04	0.49	1.07	-0.12	-1.09	1.39	0.02	0.22	1.07
Capability	0.20	2.62**	1.03	0.06	0.56	1.13	0.07	0.81	1.02
Strength	0.02	0.21	1.02	0.11	1.16	1.06	0.09	0.96	1.11
Knowledge cultivating	0.15	1.93	1.13	-0.03	-0.28	1.05	0.49	4.41**	1
Trust	0.10	1.09	1.46	0.24	2.05*	1.30	0.05	0.47	1.37
Ownership structure	0.14	1.81	1.02	0.07	0.76	1.05	0.16	1.80	1.08
Prior tie	0.02	0.20	1.03	0.05	0.58	1.02	0.10	1.10	1.03
Complementarity	-0.09	-1.09	1.02	-0.02	-0.23	1.03	-0.09	-1.05	1.01
Ambiguity	-0.13	-2.19*	1.03	-0.03	-0.35	1.02	0.04	0.43	1.03
Trialability	0.12	1.46	1.08	0.05	0.48	1.05	0.05	0.52	1.06
Usage advantage	0.59	6.82**	1.03	0.37	2.57**	1.30	0.47	2.85**	1
R^2	0.40			0.17			0.22		
SEE	0.43			0.64			0.82		
F-value	21.83**			10.35**			13.97**		

* Statistical significance at the .05 level
**Statistical significance at the .01 level

Model 1: Overall Learning

In the model 1, overall learning was the dependent variable. The signs of the coefficients were generally consistent with hypothetical expectations, except that of complementarity. Firm's capability and usage advantage positively related to overall learning. Both variables were significant at the 0.01 level. Ambiguity negatively related to overall learning. Ambiguity was significant at the 0.05 level. The t-statistics indicated that the coefficients differed significantly from zero. Cultural similarity, firm's strength, firm's knowledge cultivating activities, trust, ownership structure, prior tie, complementarity, and trialability were not significant. The VIF values in no case exceeded 5 suggesting no severe multicollinearity presented.

The value of the coefficient of determination (R^2) at the 0.40 indicated that capability, ambiguity, and usage advantage accounted for forty percent of the

variation in the overall learning of local firms. The value of Standard Error of the Estimate (SEE) at the 0.43 indicated that, on average, the model generated a small amount of prediction error. The F-test indicated that the model was statistically significant at the 0.01 level. Hence, the null hypothesis of no linear relationships between overall learning of local firms and independent variables, i.e., capability, ambiguity, and usage advantage was rejected.

Model 2: Productivity Improvement

In the model 2, productivity improvement was the dependent variable. The signs of the coefficients were generally consistent with hypothetical expectations, except those of cultural similarity, firm's knowledge cultivating activities, and complementarity. Usage advantage and trust positively related to productivity improvement. Usage advantage was significant at the 0.01 level. Trust was significant at the 0.05 level. The t-statistics indicated that the coefficients differed significantly from zero. Cultural similarity, receptivity, ownership structure, prior tie, complementarity, ambiguity, and trialability were not significant. None of the VIF values suggested the presence of serious multicollinearity since the values in no case exceeded 5.

The value of the coefficient of determination (R^2) at the 0.17 indicated that seventeen percent of the total variance accounted for in the productivity improvement of local firms were attributable to changes in usage advantage and trust. The value of Standard Error of the Estimate (SEE) at the 0.64 indicated that, on average, the model generated a small amount of prediction error. The F-test indicated that the model was statistically significant at the 0.01 level. Hence, the null hypothesis of no linear relationships between the productivity improvement and independent variables, i.e., usage advantage and trust, was rejected.

Model 3: Innovation

In the model 3, innovation was the dependent variable. The signs of the coefficients were generally consistent with hypothetical expectations, except those of

complementarity and ambiguity. Knowledge cultivating activities and usage advantage were positively related to innovation and were significant at the 0.01 level. The t-statistics indicated that the coefficients differed significantly from zero. Capability, firm's strength, trust, ownership structure, prior tie, complementarity, ambiguity, and trialability were not significant. The VIF values in no case exceeded 5, therefore, no severe multicollinearity was presented.

The value of the coefficient of determination (R^2) at the 0.22 indicated that knowledge cultivating activities and usage advantage accounted for twenty-two percent of the variation in the innovation of local firms. The value of Standard Error of the Estimate (SEE) at the 0.82 indicated that, on average, the model generated a small amount of prediction error. The F-test indicated that the model was statistically significant at the 0.01 level. Hence, the null hypothesis of no linear relationships between the innovation of local firms and independent variables, i.e., knowledge cultivating activities and usage advantage, was rejected.

Multiple Discriminant Analysis

A multiple discriminant analysis was performed with the innovation adoption as the grouping variable. Predictor variables included firm's cultural similarity, receptivity (i.e., capability, firm's strength, knowledge cultivating activities), trust, ownership structure, prior tie, complementarity, ambiguity, trialability, and usage advantage. The stepwise estimation approach was employed. Results of the analysis are presented in Table 5.26.

Evaluation for the Assumptions of Multiple Discriminant Analysis

Unequal covariance matrices can adversely affect the classification process. Therefore, it is desirable to obtain equal covariance for the groups as defined by the dependent variable (Hair, Anderson, Tatham, and Black, 1995: 196). The assumption of equal covariance or dispersion matrices was evaluated by using the Box's M test. The test statistic failed to reject the hypothesis of the similarity of the dispersion

matrices of the independent variables between the three groups of the dependent variable. Therefore, the assumption of equal covariance was not violated.

Estimation of the Discriminant Functions

On a univariate basis, trust, ownership structure, and usage advantage displayed significant differences between the group means. Two canonical discriminant functions were derived. Only ownership structure and usage advantage entered into the discriminant function.

The first discriminant function accounted for 20.7 percent of the variance in the technology utilization of local firms. The second discriminant function accounted for 0.2 percent of the variance. The canonical correlation, which measured the strength of the overall relationships between the predictors and the set of dependent variable, indicated the values of 0.414 and 0.049 in function 1 and function 2, respectively. Only function 1 was significant at the level of 0.001.

F-statistics suggested that usage advantage was more important than ownership structure in discriminating the level of innovation adoption of local firms. Discriminant function loadings in function 1 implied that usage advantage and ownership structure positively related to the innovation adoption of local firms.

Validating Overall Fit of the Discriminant Functions

The classification result indicated 51 percent of original grouped cases correctly classified. Following Hair, Anderson, Tatham, and Black (1995: 205), this level of predictive accuracy is acceptable when comparing to the percentage that the grouped cases could be classified correctly by chance. As a rule-of- thumb, it is suggested that the classification accuracy should be at least one-fourth greater than that achieved by chance. The determination of the chance classification is obtained by dividing 1 by the number of groups. In case of three groups, the chance accuracy is 33.33 percent; hence, the classification accuracy should be 41.66 percent. The classification accuracy of 51 percent was consequently acceptable. Therefore, it could

be concluded that usage advantage and ownership structure were predictor variables for the variance in the innovation adoption of local firms.

Table 5.26 Result of Multiple Discriminant Analysis

Variables	Mean difference		Structure matrix	
	F	Sig.	Function 1	Function 2
Cultural similarity	.157	.855	.274	-.016
Capability	.839	.435	.088	-.011
Strength	2.366	.443	.305	.011
Knowledge cultivating	.821	.099	.123	.185
Trust	3.472	.035	.436	-.158
Ownership structure	4.456	.014	.654*	.757
Prior tie	1.469	.235	.011	-.099
Complementarity	1.349	.264	-.077	-.035
Ambiguity	.397	.673	-.116	.040
Trialability	.935	.396	.147	-.009
Usage advantage	6.303	.003	.781**	-.625
Box's M (sig.)	8.113 (0.248)			
Eigenvalue			.207	.002
% of variance explained			98.9	1.1
Canonical correlation			.414	.049
Significance level			.001	.627

Hypothesis Testings

Nine hypotheses were tested by using multiple regression analyses and multiple discriminant analysis. A summary of the results of hypothesis testings are depicted in Table 5.27. Results of the tests are as follows.

Hypothesis 1: Cultural Similarity

Hypothesis 1 posits that the greater the degree of cultural similarity between partner firms, the higher the likelihood that learning will take place.

The correlation analysis indicated that cultural similarity was positively related to the overall learning at the 0.05 level of significance. Nevertheless, the correlation was low.

Cultural similarity did not significantly related to the overall learning, the productivity improvement, and the innovation of local firms in the multiple regression analysis and the ANOVA. The relationships between cultural similarity and every measure of learning were positive as hypothesized except that in the model of productivity improvement in the multiple regression analysis.

The multiple discriminant analysis indicated that cultural similarity presented no significant difference between the group mean of innovation adoption of local firms and did not enter into the discriminant function. However, the relationship between cultural similarity and innovation adoption was positive but not significant.

The hypothesis was not supported.

Hypothesis 2: Receptivity

Hypothesis 2 posits that the greater the level of receptivity, the greater the likelihood that learning will take place. In this analysis, receptivity was three-dimensional, i.e., information management capability, resources strength, and knowledge cultivating activities.

The correlation matrix indicated that capability related significantly only to the overall learning. Firm's resources strength and knowledge cultivating activities of local firms related significantly to the overall learning and the innovation.

The ANOVA test showed that the effects of capability and firm's resource strength were not significant to any measure of learning. The effects of knowledge cultivating activities on the productivity improvement and the innovation of local firms were significant at the 0.05 level and the 0.01 level, respectively.

To the multiple regression analysis, capability significantly related to the overall learning at the 0.01 level. Knowledge cultivating activities significantly related to the innovation at the 0.01 level. Firm's strength did not relate significantly to any measures of learning.

The multiple discriminant analysis indicated that all three dimensions of receptivity presented no significant difference between the group mean of innovation adoption of local firms and did not enter into the discriminant function. The relationship between receptivity and innovation adoption was positive but not significant.

The hypothesis was, therefore, partially supported.

Hypothesis 3: Trust

Hypothesis3 posits that the greater the degree of trust, the greater the likelihood that learning will take place.

The correlation matrix indicated that trust positively related to all four measures of learning of local firms at the 0.01 level of significance.

The ANOVA test showed that the effects of trust on the overall learning and the productivity improvement were positive and significant at the 0.01 level and the 0.05 level, respectively.

The multiple regression analysis indicated that the relationships between trust and all measures of learning were positive which were consistent with the hypothesis. However, only the relationship between trust and the productivity improvement was significant at the 0.05 level to the multiple regression analysis.

The multiple discriminant analysis indicated that trust presented significant difference between the group mean of innovation adoption of local firms. The relationship was positive. However, trust did not enter into the discriminant function.

Therefore, the hypothesis was partially supported.

Hypothesis 4: Ownership Structure

Hypothesis 4 posits that the greater the degree of ownership in the alliance, the greater the likelihood that learning will take place.

The correlation matrix indicated that ownership structure related positively to the innovation and the innovation adoption of local firms at the 0.01 level of significance and to overall learning at the 0.05 level of significance.

The ANOVA test showed that the effects of ownership structure on the overall learning and the innovation of local firms were positive at the 0.05 level and the 0.01 level of significance, respectively.

The multiple regression analyses indicated that the relationships between ownership structure and learning in all three models were positive. The direction of the relationships was consistent with the hypothesis. However, ownership structure did not contribute significantly to any multiple regression models.

The multiple discriminant analysis indicated that ownership structure presented significant difference between the group mean of innovation adoption of local firms and entered into the discriminant function. The relationship between ownership structure and innovation adoption was positive as hypothesized.

Therefore, the hypothesis was partially supported.

Hypothesis 5: Complementarity

Hypothesis 5 posits that the greater the degree of complementarity between partners, the greater the likelihood that learning will take place.

Contradicted to previous studies, the correlation matrix indicated that complementarity negatively related to the overall learning, the productivity improvement, and the innovation.

The ANOVA also indicated that the effect of complementarity on the innovation was negative.

The multiple regression analyses also indicated that the relationships between complementarity and three measures of learning were negative.

The multiple discriminant analysis indicated that complementarity presented no significant difference between the group mean of innovation adoption of local firms and did not enter into the discriminant function. The analysis also indicated that the relationship between complementarity and innovation adoption was negative.

All analyses found no support on the relationship between complementarity and all four measures of learning. The relationship between complementarity and learning was not significant to all statistical tests. The direction of relationships

between complementarity and learning was negative which contradicted to previous studies.

Thus, the hypothesis was not supported.

Hypothesis 6: Prior Tie

Hypothesis 6 posits that the stronger the degree of prior tie between partners, the greater the likelihood that learning will take place.

The correlation matrix indicated that prior tie positively related to the innovation and the innovation adoption at the 0.05 level of significance.

The ANOVA indicated that prior tie had negative effect on the overall learning but positive on the productivity improvement and the innovation. However, the effects were not significant.

The relationships between prior tie and all measures of learning were positive but not significant to the multiple regression analyses.

The multiple discriminant analysis indicated that prior tie presented no significant difference between the group mean of innovation adoption of local firms and did not enter into the discriminant function. The relationship between prior tie and innovation adoption was positive as hypothesized but not significant.

Therefore, the hypothesis was not supported.

Hypothesis 7: Ambiguity

Hypothesis 7 posits that the lower the degree of ambiguity of the knowledge, the greater the likelihood that learning will take place.

The correlation matrix indicated that ambiguity was negatively related to all measures of learning. However, only the relationship between ambiguity and the overall learning was significant at the 0.05 level.

Ambiguity was not significant to the ANOVA. The ANOVA indicated that the effect of ambiguity was negative to the overall learning but positive to the productivity improvement and the innovation.

The multiple regression analyses indicated that ambiguity related significantly only to the overall learning at the 0.05 level. The relationships between ambiguity and the overall learning and the productivity improvement were consistent with the hypothesis. However, the relationship between ambiguity and the innovation was positive, indicating a contradiction to the hypothesis.

The multiple discriminant analysis indicated that ambiguity was not significant to discriminate innovation adoption of local firms although the relationship was negative as hypothesized.

The hypothesis, then, was partially supported.

Hypothesis 8: Trialability

Hypothesis 8 posits that the greater the degree of knowledge trialability, the higher the likelihood that learning will take place.

The correlation matrix indicated that trialability positively related to every dimension of learning. However, only the relationship between trialability and the overall learning was significant at the 0.01 level.

The ANOVA indicated that the effect of trialability on the overall learning was positive and significant at the 0.05 level.

The multiple regression analyses indicated that trialability was not significantly related to any measures of learning although the relationships were positive as hypothesized.

The multiple discriminant analysis indicated that trialability presented no significant difference between the group mean of innovation adoption of local firms and did not enter into the discriminant function. The relationship between trialability and innovation adoption was positive as hypothesized but not significant.

The hypothesis, thus, was not supported.

Hypothesis 9: Usage Advantage

Hypothesis 9 posits that the greater the usage advantage of knowledge, the higher the likelihood that learning will take place.

Summary of Hypotheses testing and Significant Variables

Table 5.27 summarizes the results of hypotheses testing. The signs in the parentheses indicate the directions of relationship between the dependent and the independent variables as were found from the multiple regression and the multiple discriminant analyses. Table 5.28 reports variables that are significant to any of four statistical methods employed to analyze data in this study.

Table 5.27 Summary of Hypotheses Tests

Variables	Expected sign	Overall Learning	Productivity improvement	Innovation	Innovation adoption
Cultural similarity	+	No support (+)	No support (-)	No support (+)	No support (+)
Receptivity	+				
• Capability		Support (+)	No support (+)	No support (+)	No support (+)
• Strength		No support (+)	No support (+)	No support (+)	No support (+)
• Knowledge cultivating		No support (+)	No support (-)	Support (+)	No support (+)
Trust	+	No support (+)	Support (+)	No support (+)	No support (+)
Ownership structure	+	No support (+)	No support (+)	No support (+)	Support (+)
Prior tie	+	No support (+)	No support (+)	No support (+)	No support (+)
Complementarity	+	No support (-)	No support (-)	No support (-)	No support (-)
Ambiguity	-	Support (-)	No support (-)	No support (+)	No support (-)
Trialability	+	No support (+)	No support (+)	No support (+)	No support (+)
Usage advantage	+	Support (+)	Support (+)	Support (+)	Support (+)

Table 5.28 Summary of the Significant Variables

Overall learning	Productivity improvement	Innovation	Innovation adoption
Cultural similarity	Receptivity	Receptivity	Trust
Receptivity	Trust	Trust	Ownership structure
Trust	Usage advantage	Ownership structure	Prior tie
Ownership structure		Prior tie	Usage advantage
Ambiguity		Usage advantage	
Trialability			
Usage advantage			