

**A SCALE TO MEASURE STRATEGIC ALLIANCE PERFORMANCE:
AN ALTERNATIVE OPERATIONALIZATION FOR SPILLOVER EFFECTS**

Nihat GUMUS¹

Bilgi University, Istanbul

ABSTRACT

The underlying motive of this study is the question of to develop a scale to measure the construct of strategic alliance performance. Following a literature and qualitative research processes including a focus group and in-dept interview, three dimensions of strategic alliance performance are determined, namely the spillover effects, the overall satisfaction level with the alliance, and the financial and marketing performance. Subsequent to the qualitative research, explanatory factor analysis has been applied to a data set that is collected from a sample of business professionals via two different types of scales composed at the qualitative research phase. As a conclusion, an 11-item scale is attained with three dimensions explaining the strategic alliance performance. The scale is turned out to be reliable and valid as respect with Cronbach's Alpha and Multi-Trait Multi-Method logic despite some shortcomings in terms of convergent and discriminant validity. In addition to the operationalization of overall satisfaction level and financial and marketing performance as dimensions of strategic alliance performance, the main contribution of the study is an alternative operationalization for spillover effects by referring to enhancement within each partner's knowledge base and improvements in product quality and effectiveness.

INTRODUCTION

The underlying motive of this study is the question of how to decide whether a specific strategic alliance is successful or not. The measurement of strategic alliance performance is crucial in determining the contribution that the alliance made to participant firms. In other words, rating the relative importance of the alliance for each participant is directly related to the perception of each participant of the overall alliance performance level.

¹ Nihat Gumus is a PhD student at Istanbul Bogazici University Management Department and teaching assistant at Istanbul Bilgi University e-MBA Program. Address: Eski Silahatarağa Elektrik Santrali Kazım Karabekir Cad. No:1 Eyup 34060 Istanbul, TURKEY, e-mail: ngumus@bilgi.edu.tr

This perception determines the value of the alliance to each partner and leads to the decision to cease or continue with the alliance. Therefore, the determination of various dimensions that can be used in measuring strategic alliance performance will contribute to the decision making process of related agencies who are responsible for the management of the alliance.

The issues related to strategic alliances have gained special interest in management theory in recent years. Especially due to increased speed in globalization process, the cross border strategic alliances between firms from different countries have been handled from various perspectives ranging from international business literature to organization behavior aspects of cultural diversity. Furthermore, strategic alliances have become one of the mostly preferred forms of foreign direct investments which are a critical issue in development economics literature. This situation adds to the significance of determining appropriate measures of strategic alliance performance. In other words, by means of various criteria to determine the overall success level of a strategic alliance, not only the relative contribution of the alliance to the partner firms but also the relative contribution of various strategic alliance to the economy of the host country can be estimated.

The term, strategic alliance, is defined as a long-term cooperative business agreement between two or more separate cooperations to work together in one or more (but not all) areas of activity in which they are involved for achieving some agreed strategic objectives (Siriwoharn, 1997). There are several theories explaining the underlying motives for constructing a strategic alliance. The resource-based theory of strategic alliances explains the behavior to set up a strategic alliance by referring to the lack of some specific resources by the partner firms. These resources include knowledge base, technological infrastructure, capital, etc. On the other hand, the effectiveness of structure theory explains the strategic alliance motive by referring to the firms' intentions to increase their effectiveness (Dollinger, et.al, 1997). The game theoretical perspective handles the concept of strategic alliance by relating it

to the concept of competitiveness. Given the assumptions of the game theory, the firms engage in strategic alliance to enhance their relative position against competitors. Finally, the transaction cost economics perspective approaches to the issue by using the motive to decrease the frictions inherent within an economic behavior, i.e., a strategic alliance is constructed to avoid the cost that will be faced if the firm takes the actions associated with the alliance alone rather than together with its partner (Parkhe, 1993).

Although there are a lot of theoretical frameworks to analyze underlying motives to engage in strategic alliances that refers one of the grand theories mentioned above, there is not such a well-established and widely-accepted theory related to strategic alliance performance. Rather the literature is full of with contributions that are related to various dimensions of the issue. Therefore, it is hard to present a complete list of factors that should be regarded as appropriate indicators of strategic alliance performance.

The purpose of this study is to present a scale to measure the strategic alliance performance construct. In the first part of the study, a scale is developed by referring to the literature review and qualitative research designs implemented. In the second part, the scale developed in the first part is revised by collecting data through a questionnaire and making necessary reliability and validity analyses.

PART I: SCALE DEVELOPMENT BY LITERATURE REVIEW AND QUALITATIVE RESEARCH

I. 1. LITERATURE REVIEW

As the common and well-established traditions of qualitative research (Bryman, 1988) assumes, the process of scale development in this study has also started with an extensive literature review on strategic alliance performance. Table 1 presents the summaries of some selected references as respect with the dimensions they employed to operationalize the

construct of “strategic alliance performance”. In addition, the independent variables included in the models constructed within the references are also described.

In (Arino, 2003), the construct of strategic alliance performance is operationalized by referring two dimensions, namely the spillover effects produced by the alliance and the overall satisfaction levels of parties with the alliance. On the other hand, (Kausser and Shaw, 2004) defines strategic alliance performance through three dimensions that include financial and market success, satisfaction with the relationship, and satisfaction with goals of alliance. In his PhD dissertation Lofstrom (1999) has used the concept of alliance success that is rated by respondents as the operational measure of strategic alliance performance.

In compliance with Lofstrom, (Saxton, 1997) also uses the concept of alliance success to measure strategic alliance performance. On the other hand, (Whipple and Frankel, 2000) takes overall satisfaction level with the alliance as the sole operational definition of strategic alliance performance. The mostly benefited reference in this study is the PhD dissertation of Siriwoharn (1997). In his work, he defines three dimensions of strategic alliance performance including success of strategic alliance formation, success of strategic alliance management, and overall success of strategic alliance.

Another consideration related to the literature is the reliability and validity measures utilized in the development of the scales. Nearly in all selected studies within the literature a pre-test is designed to develop the items that will be included within the scales. In addition, α -measure of reliability is the main statistic that is used in the determination of reliability levels. On the other hand, as respect with the validities of various constructs, both convergent and discriminant validities, a factor analysis is included in each study and Cronbach's Alpha statistic is taken as the main measure. There is one exception of that case, namely the (Arino, 2005), which uses Chi-square statistic as the measure of goodness of fit and different kinds of validities.

I.2. QUALITATIVE RESEARCH

In addition to the literature review explained above some qualitative research designs are also conducted to determine a scale to measure strategic alliance performance. The process is resulted in a model that tries to operationalize the construct of “strategic alliance performance”.

I.2.i. Focus Group and In-Dept Interview Design

As a first step, to get an insight about the concept of strategic alliance performance a focus group is designed composed of six PhD students at Boğaziçi University. In the focus group the participants are asked three questions. First of all, to get a start into the issue the participants are asked to give some example of successful strategic alliances. Following this question, the participants are asked the main question of interest, namely what are the requirements for a strategic alliance to be evaluated as successful. Finally, the participants are asked another question of factors that might be in relation to the construct of strategic alliance performance. This question is directed in order to differentiate the factors that are in relation to the concept of strategic alliance performance and can be taken as independent variables in a model from the factors that can actually be used as various dimensions to operationalize and measure the main construct of strategic alliance performance. In other words, by means of the second question various dimensions of strategic alliance performance is tried to be extracted while via the third question factors that might be in relation to the main construct as independent variables. Such a method is employed due to the fact that it is hard to differentiate between a dimension of a construct and an independent variable. Such a case is evident in (Arino, 2005), where the construct of goal establishment is taken as a dimension of strategic alliance performance in the early model of the study but afterwards it is recognized that it behaves like an independent variable that is correlated with strategic alliance performance.

In the focus group seven examples of strategic alliances are given by the respondents as an answer to the first question. On the other hand, 12 items are derived from the records that are stated as various factors that might be employed in evaluating a strategic alliance as successful or not. Furthermore, in relation with the third question 33 items are determined displaying the factors that will be in relation to the strategic alliance performance but should be treated as independent variables rather than as various dimensions that will be used to measure strategic alliance performance.

As a second step in qualitative research process an in-depth interview is conducted with Özlem Öz from Boğaziçi University Management Department. The same questions included within the focus group are also presented in the interview. The items that are derived from the notes of the interview are presented within the appendix. Generally 14 main factors that are in relation with strategic alliance are extracted, 3 of which can be taken as measures of strategic alliance performance while the remaining 10 factors include variables that are in relation with it but can not taken as constituting dimensions of it.

1.3. SCALE DEVELOPMENT PROCESS

From literature review and qualitative research processes a scale is established to measure the construct of “strategic alliance performance. For this purpose, a content analysis is conducted by means of two judges.

1.3.i. Content Analysis

By referring to the literature and qualitative research, three main dimensions of strategic alliance are determined. These dimensions include the spillover effects that are created through strategic alliance process, the overall satisfaction level with the alliance, and the financial and marketing performance results that are provided by the alliance. Before the content analysis a total of 23 items are determined to measure the dimensions. Of those 23

items three items are related to spillover effects, eight items were related to overall satisfaction level, and the remaining 12 items were related to financial and marketing performance. During the content analysis phase, these items are reduced to 14. The dimensions and the items related to each dimension are listed below.

Dimension 1: Spillover Effects

1. The partners have developed their technologies through the strategic alliance
2. The partners have completely reinvented procedure or product through the strategic alliance
3. The knowledge base of each partner has enhanced through the strategic alliance
(Organizational Learning)

Dimension 2: Overall Satisfaction Level with the Alliance

1. The overall satisfaction level expressed by each partner firm
2. The alliance has surpassed each organization's expectations
3. The alliance is meeting the long-term strategic goals of each partner firm
4. The alliance is meeting the operational performance goals of each partner firm.

Dimension 3: Financial and Marketing Performance

Through the strategic alliance;

1. The market shares of each partner have increased
2. The return to shareholders of each partner is increased
3. The financial ratios of each partner have developed
4. Relative position against competitors of each partner is enhanced
5. The product supplied is more effective and high in quality for users than other alternatives existing within the market
6. The profitability of each partner has improved

7. The sales volume of each partner has increased

1.3.ii. Reliability Analysis

The content analysis phase is accomplished by means of the evaluation of each judge regarding the items proposed. Depending on the data that include the assignment of each item into each subcategory by each judge, a reliability index is developed depending on four measures derived from the literature.

Table 2: Interrater Reliability Matrix 1

	JUDGE I				
		D1	D2	D3	Total
	JUDGE II	D1	3		3
		D2		4	4
		D3	1		6
		Total	4	4	6
					14

The raters have categorized nearly each item within the dimensions they are proposed to be belonged except the fifth item of the third dimension. The Judge I has categorized that item into the spillover effects dimension while the second judge has put it into the proposed dimension. Following that analysis, various interrater reliability measures are presented below.

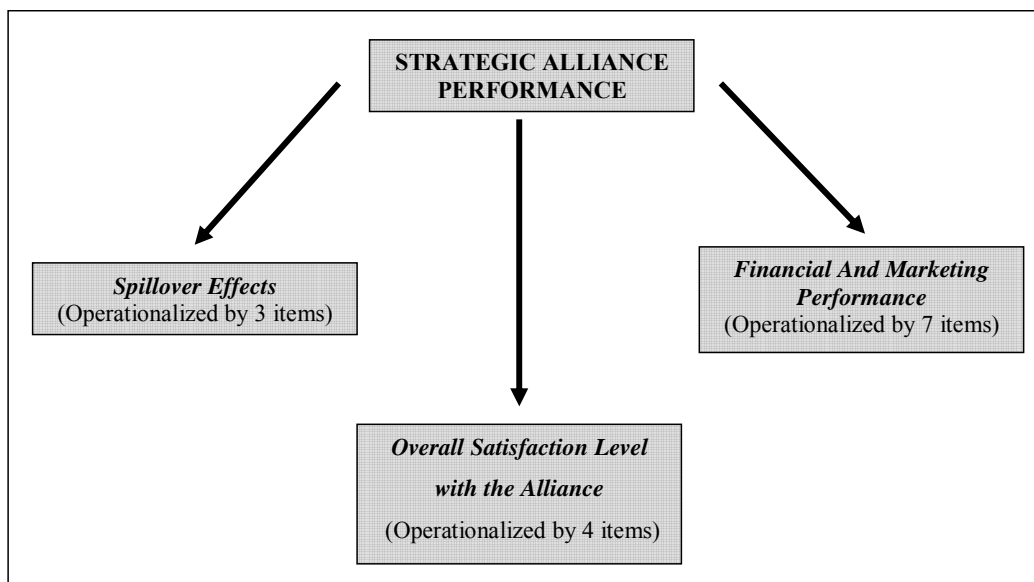
Percentage of Agreement	Cohen's Kappa	Interrater Reliability Index (I_r) (Perreault and Leigh, 1989)	z-score (1-α) (Zimmer and Golden, 1988)
0,93	0,89	0,89	0,99

The percentage of agreement is the basic measure of interrater reliability of scales developed through qualitative research design and it is simply the ratio of agreed item to total items. In

this case it is 0,93 and shows that the raters are agreed upon categorizing nearly all items into proposed categories. The Cohen's Kappa and I_r scores are the same and show large level of reliability given the items and proposed dimensions. In addition, the z-score measure of reliability displays that the probability that an item is categorized under a specific dimension by chance is 0,01 and this result corresponds to a high level of reliability.

1.3.iii. The Model developed through Qualitative Research Design

As a result the qualitative research design that includes a literature review and other qualitative research processes, a model is developed to measure the strategic alliance performance that is presented below.



PART II: SCALE DEVELOPMENT THROUGH SURVEY DESIGN

In order to develop the model and the associated scale to measure the construct of “strategic alliance performance a survey is designed that is composed of the dimensions and items proposed in Part I.

II.1. METHODOLOGY

For the purpose of developing a scale through a survey design, two questionnaires are designed one of which includes a five-point Likert scale and the other one includes a five-point semantic differential scale.

The sampling unit concept was the critical problem that is faced during the survey design process. This issue is one of the critical issues within the literature as well. Generally, in a study where the construct of strategic alliance performance is analyzed it is the strategic alliance performance itself that should be employed as a unit of analysis. For this reason, a complete analysis should include an analysis that is applied directly to various strategic alliances. Therefore, it would be much more appropriate if the survey instrument is applied directly to the subjects that have taken managerial roles in various strategic alliance examples. However, such a methodology is far from the scope, time and budget limits of this study. In the literature average time period required for such an analysis is one to two years and average response rates to questionnaires are between 20% and 30% levels (refer to the main references selected). Another method that is employed within the literature is to apply the questionnaire to subjects who have experience on managerial issues. This method is usually preferred in pre-test designs.

The methodology of this study lies somewhere between these two approaches. It is close to the pre-test methodology employed within the literature but it differs from it by the case study prepared as an entry before filling the questionnaires. Each subject was required to read the case on the cover letter of the questionnaire before passing to the questionnaire

sections. Although it would not totally substitute a direct analysis of strategic alliances, the questionnaire is applied to the subjects who are management graduates and who have at least two years of experience in business and/or academic life. The fact that the 3 dimensions and 14 items determined to measure strategic alliance performance are the result of extensive literature review and qualitative research is another reason that adds to the legitimacy of the study.

The questionnaire is mailed to over 130 persons and a total of 25 responses have been collected. In other words, the average response rate is nearly 20% as the most cases within the literature. At first glance, such a number of cases seem to be inappropriate for analysis. However, after the reliability and exploratory factor analysis it is found that a scale can be developed by even such a limited number of data set. The reason why such a result could have been achieved is explained by referring to the fact that the qualitative research design part of the study is conducted in extensive manner.

II.2. RELIABILITY AND FACTOR ANALYSIS – FIRST STAGE

II.2.i. Reliability Analysis

The results obtained for each item within the instrument that includes five-point Likert scale have exposed to reliability analysis and main statistical results are presented within the report.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,832	,826	14

As it can be seen from the table above the model developed in the qualitative research section and proposed as a survey design has a Cronbach's alpha figure of 0,832. Referring to the literature (Peter, 1979 and Churchill, 1979), such a level of reliability is significant.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig
Between People		46,571	24	1,940	5,990	,000
Within People	Between Items	25,394	13	1,953		
	Residual	101,749	312	,326		
	Total	127,143	325	,391		
Total		173,714	349	,498		

Grand Mean = 4,0286

Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig
156,536	6,021	13	12	,002

As respect with the statistical significance level of variances of and among items the ANOVA table and the Hotelling's T-Squared test result are considered. The F test result of ANOVA is significant showing the fact that there are significant variations among the mean values of each item. The Hotelling's T-Squared test is also significantly supporting the above result.

II.2.ii. Factor Analysis

An exploratory factor analysis is conducted to investigate whether the items included within the proposed scale corresponds to the proposed dimensions.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,628
Bartlett's Test of Sphericity	Approx. Chi-Square	174,166
	df	91
	Sig.	,000

The KMO statistic is 0,628. We can say that the test result is significant concluding that the sample of items is adequate for factor analysis. In addition, the Chi-Square statistic corresponding to Barlett's test is significant. This situation adds to the fact that the data set taken from the sample can be exposed to factor analysis.

The factor analysis resulted in five dimensions that have eigenvalue over the selected level of 1 when referring to the total variance explained table. The five factors can explain nearly 77,8 % of total variation among the data and this corresponds to a R^2 level above 0,5.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5,080	36,288	36,288	5,080	36,288	36,288	3,526	25,188	25,188
2	1,958	13,986	50,275	1,958	13,986	50,275	3,005	21,461	46,649
3	1,502	10,728	61,003	1,502	10,728	61,003	1,480	10,574	57,223
4	1,269	9,064	70,067	1,269	9,064	70,067	1,450	10,355	67,578
5	1,080	7,716	77,783	1,080	7,716	77,783	1,429	10,205	77,783
6	,773	5,519	83,302						
7	,639	4,562	87,863						
8	,477	3,405	91,268						
9	,356	2,545	93,813						
10	,327	2,335	96,148						
11	,292	2,084	98,232						
12	,114	,813	99,045						
13	,076	,545	99,590						
14	,057	,410	100,000						

Extraction Method: Principal Component Analysis.

If we look to the rotated component matrix we can see the items related to each factor. The first factor includes 4 items while the second factor involves 5 ones. On the other hand, the third and fourth ones are composed of two items. Only one item, item 10, falls to the fifth category.

Rotated Component Matrix

	Component				
	1	2	3	4	5
M1113	,872	,213	-,187	,124	,008
M1114	,833	,126	-,004	,283	-,125
M119	,811	,116	,080	,051	-,072
M118	,731	,087	,314	-,033	,349
M117	-,122	,854	,026	,147	-,170
M116	,367	,803	-,035	-,091	,125
M1111	,073	,722	-,062	,297	,402
M115	,481	,656	-,067	,118	-,157
M112	,239	,591	,561	-,043	,178
M114	,244	,003	-,779	,008	,105
M111	,402	-,119	,633	,147	,081
M113	,154	,097	,058	,934	-,015
M1112	,431	,472	,053	,568	,362
M1110	,079	-,017	,009	-,024	-,935

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a. Rotation converged in 6 iterations.

Although the factor analysis conducted has given significant results; the number of factors created is not in compliance with the initially proposed model that involves three dimensions.

Item-Total Statistics					
	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
M1I1	52,4000	25,333	,258	,473	,833
M1I2	52,2800	24,377	,484	,627	,821
M1I3	52,0000	24,417	,366	,646	,828
M1I4	52,1200	26,193	,074	,335	,847
M1I5	53,0400	22,540	,697	,581	,806
M1I6	52,3600	21,490	,638	,790	,807
M1I7	52,4800	24,510	,354	,590	,828
M1I8	52,4000	23,167	,514	,753	,818
M1I9	52,2800	21,877	,590	,760	,812
M1I10	52,0800	27,327	-,081	,473	,851
M1I11	52,1200	23,693	,518	,756	,818
M1I12	52,8000	22,000	,704	,895	,804
M1I13	52,4400	22,173	,713	,861	,804
M1I14	52,4000	23,083	,676	,863	,809

To deal with this issue, the item-total statistics table is analyzed and it is found out that when items 1, 4, and 10 are excluded the Cronbach's Alpha value of the model can be enhanced. Therefore, a secondary reliability and factor analysis process is implemented ignoring these three items.

II.3. RELIABILITY AND FACTOR ANALYSIS - SECOND STAGE

II.3.i. Reliability Analysis

Through conducting the second stage reliability analysis, it is found out that the Cronbach's Alpha reliability measure of the model can be enhanced to 0,871 if three items are discarded.

Reliability Statistics		
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
,871	,873	11

In addition, the ANOVA and Hotelling's T-Squared test statistic results are also significant showing that there are significant variances among the mean values of 11 items.

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Between People		53,273	24	2,220	7,375	,000
Within People	Between Items	21,069	10	2,107		
	Residual	68,567	240	,286		
	Total	89,636	250	,359		
Total		142,909	274	,522		

Grand Mean = 3,9818

Hotelling's T-Squared Test

Hotelling's T-Squared	F	df1	df2	Sig.
133,761	8,360	10	15	,000

II.3.ii. Factor Analysis

After the second stage analysis, as it would be expected, the KMO and Barlet's test statistics remained as significant showing that the model is proper for factor analysis after three items are cancelled out.

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,686
Bartlett's Test of Sphericity	Approx. Chi-Square	151,355
	df	55
	Sig.	,000

However in this stage the number of factors that have eigenvalue over 1 has been reduced to three as proposed in the initial value. This situation can be observed on the Total Variance Explained Table below. The three factors can explain nearly 72 % of the model. Although the total variance explained by the items are reduced a little bit as respect with the initial model, the corresponding R^2 is still above 0,5 and the items can explain the variation within the data more than the error terms do.

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4,965	45,138	45,138	4,965	45,138	45,138	3,311	30,097	30,097
2	1,836	16,694	61,831	1,836	16,694	61,831	3,040	27,639	57,736
3	1,109	10,085	71,916	1,109	10,085	71,916	1,560	14,180	71,916
4	,776	7,052	78,967						
5	,639	5,812	84,779						
6	,558	5,068	89,847						
7	,463	4,208	94,056						
8	,341	3,102	97,157						
9	,154	1,401	98,558						
10	,085	,774	99,332						
11	,073	,668	100,000						

Extraction Method: Principal Component Analysis.

On the other hand, if we look to the rotated component matrix, we observe that the first factor is composed of the items, 8, 9, 13, and 14. The second factor involves the items 2, 5, 6, 7, and 11. Finally the items 3, and 12 fall into the third category.

Rotated Component Matrix^a

	Component		
	1	2	3
M1113	,851	,188	,175
M1114	,838	,086	,299
M119	,824	,107	,062
M118	,768	,168	-,010
M116	,346	,813	-,029
M117	-,133	,803	,169
M1111	,054	,747	,381
M112	,253	,690	-,067
M115	,453	,613	,157
M113	,134	,060	,920
M1112	,433	,488	,621

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a. Rotation converged in 4 iterations.

As a final analysis, the item-total statistic is analyzed to make sure that the model cannot be developed further by cancelling out more items. Except the items 7 and 3, the Cronbach's alpha figure of the model cannot be increased. In the case of seventh and third items, the change in Cronbach's alpha statistic is so small (below 0,01) that it is not required to exclude that item from the model.

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
M1I2	39,6800	21,643	,510	,477	,865
M1I3	39,4000	21,833	,359	,556	,874
M1I5	40,4400	20,090	,686	,538	,853
M1I6	39,7600	18,857	,665	,767	,854
M1I7	39,8800	21,693	,388	,534	,872
M1I8	39,8000	20,500	,534	,659	,863
M1I9	39,6800	19,560	,565	,738	,862
M1I11	39,5200	20,843	,570	,740	,861
M1I12	40,2000	19,250	,752	,862	,847
M1I13	39,8400	19,890	,675	,841	,853
M1I14	39,8000	20,667	,651	,842	,856

II.4. THE REVISED SCALE AND THE MODEL DEVELOPED THROUGH SURVEY DESIGN

After the reliability and factor analyses conducted above the scale proposed to measure strategic alliance performance is revised given the excluded items and the factors determined by the analysis. The names of dimensions are retained since it is supposed that the changes in the placement of some items have not caused significant deviations in the meanings of each category. The dimension and the items falling into each dimension are listed below.

Dimension 1: Spillover Effects

1. The knowledge base of each partner has enhanced through the strategic alliance (Organizational Learning)
2. The product supplied is more effective and high in quality for users than other alternatives existing within the market

Dimension 2: Overall Satisfaction Level with the Alliance

3. The alliance is meeting the long-term strategic goals of each partner firm
4. The alliance is meeting the operational performance goals of each partner firm
5. Relative position against competitors of each partner is enhanced

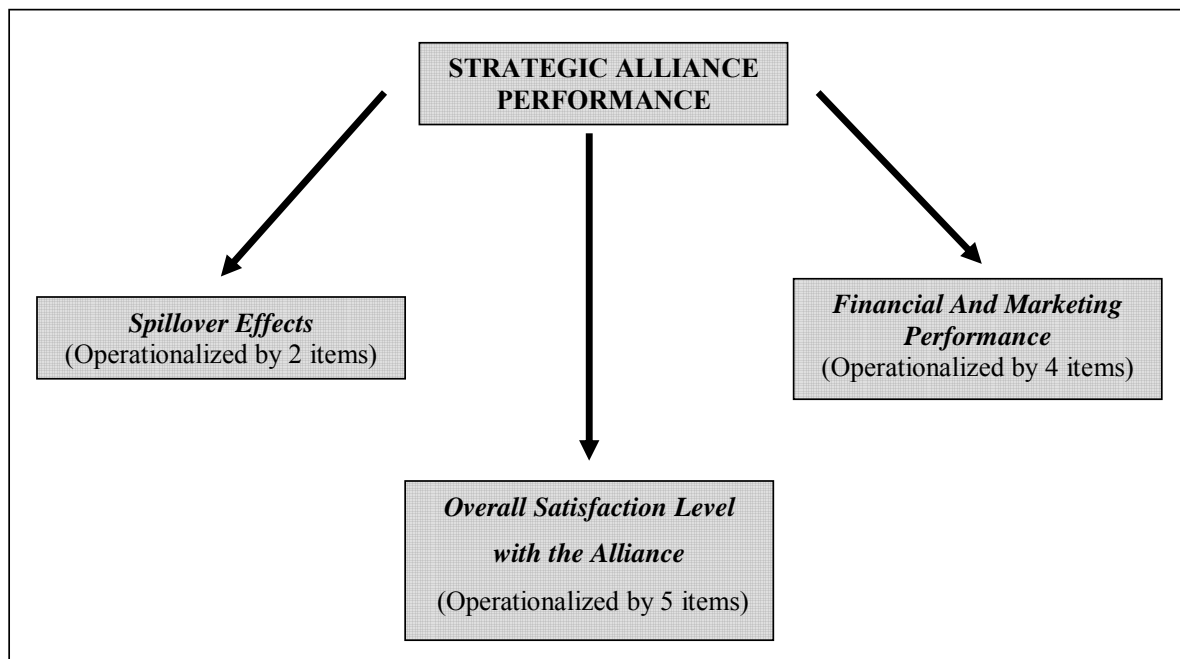
6. The partners have completely reinvented procedure or product through the strategic alliance
7. The alliance has surpassed each organization's expectations

Dimension 3: Financial and Marketing Performance

Through the strategic alliance;

8. The market shares of each partner have increased
9. The return to shareholders of each partner is increased
10. The profitability of each partner has improved
11. The sales volume of each partner has increased

The final model created to operationalize the construct of strategic alliance performance is summarized on the below model. The model is the same of the first model proposed in the first part of the study except that the items under each dimension have changed after the reliability and factor analyses.



II.4. RELIABILITY AND VALIDITY ANALYSIS VIA MTMM MATRIX

As a final stage the reliability and validity analysis of the scale developed to measure strategic alliance performance is conducted by using Multitrait-Mutimethod Matrix technique. For this purpose the data that is collected through two questionnaires is utilized. The first questionnaire includes a scale with five-point Likert scale and the second one is designed as five-point semantic differential scale. In other words, type of scale corresponds to the methods of MTMM approach.

On the other hand, scores related to each dimension are calculated by using the mean score of each item under two methods. The correlations and their significance levels under two-tailed test can be observed on the correlations table below. The highest correlation is between dimension 3 measured by the first method and the second method. This is an early sign of convergent reliability of the items used to measure the third dimension. The correlations between first dimension and the other dimensions measured by different methods are also significant. Despite some insignificant correlations displayed on the correlation table, an MTMM matrix is constructed using those coefficients.

		Correlations					
		M1D1	M1D2	M1D3	M2D1	M2D2	M2D3
M1D1	Pearson Correlation	1	,510**	,489*	,582**	,480*	,505*
	Sig. (2-tailed)		,009	,013	,002	,015	,010
	N	25	25	25	25	25	25
M1D2	Pearson Correlation	,510**	1	,427*	,360	,718**	,434*
	Sig. (2-tailed)	,009		,033	,077	,000	,030
	N	25	25	25	25	25	25
M1D3	Pearson Correlation	,489*	,427*	1	,350	,354	,849**
	Sig. (2-tailed)	,013	,033		,086	,082	,000
	N	25	25	25	25	25	25
M2D1	Pearson Correlation	,582**	,360	,350	1	,294	,388
	Sig. (2-tailed)	,002	,077	,086		,154	,055
	N	25	25	25	25	25	25
M2D2	Pearson Correlation	,480*	,718**	,354	,294	1	,479*
	Sig. (2-tailed)	,015	,000	,082	,154		,015
	N	25	25	25	25	25	25
M2D3	Pearson Correlation	,505*	,434*	,849**	,388	,479*	1
	Sig. (2-tailed)	,010	,030	,000	,055	,015	
	N	25	25	25	25	25	25

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 3: MTMM Matrix

		METHOD 1			METHOD 2		
		D1	D2	D3	D1	D2	D3
METHOD 1	D1	0,71					
	D2	0,51	0,83				
	D3	0,49	0,43	0,86			
METHOD 2	D1	0,58	0,36	0,35	0,49		
	D2	0,48	0,72	0,35	0,29	0,70	
	D3	0,51	0,43	0,85	0,39	0,48	0,85

The reliability diagonal which is composed of the yellow cells of the matrix includes the Cronbach's alpha values of each dimension. For a scale to be reliability each value significantly high. Except the Cronbach's alpha value of the first dimension under two different methods all values are above 0,7 which lead to the conclusion that the scale is reliable.

For convergent validity two conditions should be satisfied. First of all, the figures within the reliability diagonal should be highest. This condition is partially satisfied in our model. For six coefficients between various dimensions this condition is not satisfied. This situation weakens the convergent validity of the scale. The second condition for convergent validity is that correlations in the validity diagonal which is composed of the orange cells in the above matrix should be significantly different from zero. This condition is fully satisfied. All correlations in the validity diagonal are significant at 95% level of confidence.

As respect with discriminant validity three conditions should be satisfied. First of all, the validity diagonal correlations should be higher than the correlations in their column and row in the same heterotrait-heteromethod triangles. Those triangles are the blue cells on the above matrix. This condition is fully satisfied in our case. The second condition for discriminant validity is that the validity diagonal correlations should be higher than all the other correlations in heterotrait-monomethod triangles. These triangles are the green cells in the above matrix. This condition is also satisfied in our model. The final condition for discriminant validity is that the same general pattern of trait (dimension) interrelationships should be observed in all heterotrait-heteromethod and heterotrait-monomethod triangles.

This situation does not hold in our model. For instance, in the first heterotrait-monomethod triangle the highest correlation is that between dimension one and dimension two, namely between spillover effects and overall satisfaction level. However, in the second triangle the highest correlation is between dimension two and three, namely between overall satisfaction and financial and marketing performance. In addition, the patterns within the heterotrait-heteromethod triangles are not the same. In one of them, the correlation between second and third dimensions is the highest one while in the other the highest correlation is observed between dimension one and dimension two. The lack of satisfying the last condition of discriminant validity weakens the degree of validity.

As a conclusion, it can be stated that our model is far from being a perfectly reliable and valid model. First of all, some correlations used in the MTMM matrix are insignificant. Therefore for these correlations we can not conclude that these correlations are significantly different from zero. However, once the MTMM matrix is constructed even if it includes some insignificant correlations there are some threats to reliability and validity of the model. Given the correlations, the model is reliable to a large extent except one case where the Cronbach's Alpha value of the first dimension measured under the second method is not great enough. In addition there are some violations of some requirements for convergent and discriminant validities. However, assuming the significance of correlations, it might be possible to conclude that although the model does not perfectly satisfy all conditions for reliability and validity, it can be regarded as reliable and valid to a large extent.

IV. CONCLUSION AND LIMITATIONS

This study involves an attempt to develop a scale to measure strategic alliance performance. In the first part of the study a scale is proposed based on the items and dimensions derived from literature review, focus group design, and in-depth interview conducted. The reliability of this proposed model is tested through an interrater reliability process and it is found out

that the scale is reliable to a large extent. This model has included a total of 14 items which belong to 3 dimensions namely the spillover effects associated with the strategic alliance, the overall satisfaction level, and financial and marketing performance indicators.

At the second stage, the scale developed is tested by collecting data from a sample of 25 management graduates with at least two-years of experience in business and/or in academic life. Two types of questionnaires one with Likert and the other with semantic differential scale are used in collecting data. The data collected is exposed to a two-stage reliability and factor analysis and the number of total items is reduced to 11. The dimensions have remained the same while the placement of some items has changed. The results of reliability and factor analysis have displayed that the model constructed is significant and can explain a large portion of the variation within the data collected. Finally, by means of MTMM matrix technique the reliability and validity of the model are tested and it is found out that despite some weaknesses the model is reliable and valid to a large extent.

Generally, the model developed here has a lot of limitations. First of all, the sampling unit problem is the most crucial one in the survey design. It would be much more appropriate to take “the strategic alliance” itself as the sampling unit and applying the questionnaire directly to people who has experience in various strategic alliances. However, due to the reasons such as time, budget constraints and the negative attitude of firms towards responding to such studies this could not be accomplished. Although this problem is tried to be overcome by presenting a case in the questionnaire applied, the survey conducted can still be regarded as a pre-test study. Therefore, it is a must to rearrange the questionnaire and apply it by taking the strategic alliance itself as the sample unit.

As a second limitation, the study bears some weaknesses associated with a qualitative research design, although some statistical techniques are employed. Basically, the selection of items and dimensions are based on the concept of theoretical sampling. In other words, they

are intentionally determined and therefore needs verification through triangulation and repetition. And finally, the analysis would be much more appropriate if the experimental design could have been implemented.

However, despite its limitations the scale developed still involves important theoretical as well as managerial implication. It is found out that in evaluating a strategic alliance, it is not only the financial and marketing results that are of special importance. Overall satisfaction with the alliance as respect to its compliance with the long-term and operational goals of the partners and the spillover effects associated with the alliance should also be considered.

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