PERFORMANCE EVALUATION CRITERIA FOR INTERNATIONAL JOINT VENTURE

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ABSTRACT

Joint ventures are different from traditional organizations in terms of their life cycle and therefore their performance measures tend to be somewhat different. The traditional approaches to performance evaluation for an organization offer a diverse set of measures in financial management. However, they omit an aspect in case of IJVs – IJVs are a new form of entity with at least two partners with varied interests - which, both IJV managers and business theoreticians are now paying increasing attention to. Apart from traditional financial performance criteria, non-financial performance criteria show strong promise for measuring IJV performance. This research paper presents various IJV performance criteria and assesses them as perceived by the Indian automotive IJVs. It attempts to look for a holistic measure that can be used to quantify the performance of an IJV.

Keywords: international joint ventures, joint ventures, performance evaluation criteria, structural equation modeling

INTRODUCTION

Each organization has a vision and a mission on which it works to achieve its goals. The organization is considered successful if it achieves what it has aimed for. For assessing the performance of any organization, there are several business measures. Like any other organization, joint ventures also need to be and can be evaluated for their performance. Joint ventures are different from traditional organizations in terms of their life cycle and therefore their performance measures tend to be somewhat different. It does not seem appropriate to measure the performance of joint ventures on the same parameters as any other organization.

It has been found that international joint venture (IJV) either succeed and grow well or perform moderately or breakdown. If IJV has to be successful then it has to excel in one of the general parameters of performance. These performance measures can be financial like rate of return on capital employed (or investment), return on

equity, P/E ratio or production-based like market share, sales turnover, capacity expansion, etc. In case of IJVs, there can be partner relationship items that can be performance measures or criteria. These can be partner satisfaction, harmony between partners or age of IJV.

This research paper presents the international joint venture performance criteria as perceived by the IJVs in the automotive sector in India. It assesses various criteria of performance for automotive IJVs and attempts to look for a holistic measure that can be used to quantify the performance of an IJV. The paper discusses a list of performance criteria for an IJV. These performance criteria have been short-listed from the literature, previous researches, financial results of the organizations and comments from business respondents. This paper analyses the importance of these criteria for performance of the IJVs in Indian automotive sector and attempts to prioritize these for IJVs. The performance evaluation criteria discussed are empirically tested using a structured instrument and results presented.

The paper begins with a descriptive analysis of the performance evaluation criteria and ranks them, presents results using factor analysis, reliability analysis and subsequently gives structural equation model for IJV performance evaluation. Reliability analysis is done to validate and test the internal consistency and reliability of the scales for the factors. "International joint venture performance evaluation criteria model" is designed and implemented using structural equation modeling technique. AMOS (Analysis of Moment Structures) package is used to pictorially represent the model and to establish the interactions amongst observed (measured) variables and latent (unobserved) variables and amongst the latent variables themselves using quantitative measures and values. The paper concludes with the discussion of the results and the implications for the theory.

LITERATURE

Many factors may have a potential impact on joint venture performance, ranging from the nature of the industry environment within which the IJV operates to the quality of the management of the IJV. Authors make a broad distinction between those variables which pertain at the time of alliance formation, for convenience termed the ex ante factors, and those variables which apply during the operation of the alliance, particularly the nature of the alliance management process and partner-venture interdependency, termed the ex post factors. Early studies by Tomlinson (1970) and Lecraw (1983) used a variety of financial indicators typically employed in business research, such as profitability, growth and cost position for measuring the performance of a joint venture (JV). Others have used objective measures of performance such as the survival of the IJV (Franko 1971, Stopford and Wells 1972, Killing 1983, Geringer 1991), its duration (Harrigan 1986, Kogut 1988), instability (significant changes) in its

ownership (Franko 1971, Gomes-Casseres 1987), and renegotiation of the JV contract (Blodgett 1992). In addition, IJV partners commonly generate financial returns through mechanisms other than dividends, including supply contracts, management fees, technology licensing fees, royalties and transfer pricing.

Killing (1983) has measured the performance via management assessment of the JV's performance (ranging from poor to good), as well as evaluating the liquidation or reorganization of the JV as a sign of failure. To justify use of these variables rather than financial indicators, author explained that the profitability of the JV for a parent firm is not based solely on the JV's profits, but also on transfer prices, royalties and management fees not included in traditional financial performance measures. Due to this deficiency, traditional financial measures have been, judged to be inadequate for use within the context of JVs. Consistent with his hypothesis, author has found that JVs with dominant partner have tended to be more successful, on both measures, than the shared management ventures. Independent JVs have also exhibited superior levels of performance.

Financial and objective measures may also fail to adequately reflect the extent to which an IJV has achieved its short-term and long-term objectives (Killing 1983, Artisien and Buckley 1983, Blodgett 1992). IJVs may be formed for pursuing a variety of objectives, from technology transfer and joint research to access to materials, new markets or scale economies (Porter and Fuller 1986). Many IJVs also operate where measures of short-term financial performance might suggest that the venture is performing poorly. For example, IJVs formed to develop radical new technologies (e.g., bio-engineered pharmaceutical or superconductors) or new markets are often not likely to generate a financial profit for many years, if at all. In such situations, a financial or objective measure is unlikely to accurately capture an IJV's relative performance versus objectives. As Anderson (1990) has noted, financial measures evaluate only one dimension of performance. Other factors, including qualitative ones, must also be examined in order to adequately evaluate IJV performance. Thus, despite poor financial results, liquidation or instability, an IJV may have been meeting or exceeding its parents' objectives and thus be considered successful by one or all of the parents. Conversely, an IJV may be viewed as unsuccessful despite good financial results or continued stability.

Geringer & Hebert (1991) have used both subjective and objective measures of performance to evaluate overall performance of the joint venture. Subjective performance measures included each partners' satisfaction with the IJV overall performance using 5-point scale. Objective IJV performance is measured in three ways: survival, stability and duration. Objective measures were positively correlated, although not perfectly, with parent firms' reported satisfaction with IJV performance and with perceptions of the extent to which an IJV performed relative to its initial objectives. In the absence of other performance data, the use of objective measures as

reliable performance surrogates may thus be justifiable. This result suggests that IJVs perceived by their parents as performing more successfully were more likely to remain in operation than those IJVs that were evaluated as being less successful. Successful IJVs also tended to remain in operation for a longer period of time, a correlation that received support from data on the IJV duration measure.

Mills and Chen (1996) have shown the shortcomings of the conventional indicators of performance used in strategic analysis & evaluation of JV performance and have presented Strategic Value Analysis (SVA) as a more comprehensive measure of performance. It is a value-based approach, which draws upon cash flow analysis and assumes that the value of a business can be determined by discounting its future cash flows using an appropriate cost of capital. The major advantage of the SVA approach is that it relates value of the business to inputs and value drivers that drive business performance over the long term.

Shiva Ramu (1996) enumerates measure of performance as financial indicators, survival of joint venture, duration, instability of ownership and re-negotiation of contract. Anderson (1990) has said that performance evaluation becomes exceptionally difficult because joint ventures are often undertaken for amorphous purposes such as opening a window on a technology, and in highly uncertain risky settings. Conventional performance appraisals tend to be misleading under such circumstances. As quoted by Anderson (1990), routine assessment of financial performance may be comfortable, but it is unlikely to produce accurate assessments of IJV performance. This is because IJVs are different from conventional corporate firms. Joint ventures are especially popular in risky, uncertain situations, for it is there that firms are most likely to concede some control if that will spread risk and expand expertise. But when risk and uncertainty are high, profitability by itself is a poor measure of the joint venture's value. For start-up or high-risk businesses, profits if any, are in the future, and high costs are in the present. Thus the venture may be making satisfactory progress toward long-term goals, or meeting current goals that are not financial in nature. Standard operating procedure, then, will mis-state the venture's performance.

The failure of financial and objective measures to reflect adequately the extent to which an international joint venture has achieved its aims is stressed by Geringer and Hebert (1991), who argue that despite poor financial results, liquidation or instability, an international alliance may have met or exceeded the parents' objectives and so be considered successful by one or all of the parents. Conversely an international joint venture may be viewed as unsuccessful despite good financial results or continued stability. Anderson (1990) takes this point further by arguing that parents should recognize that most international joint venture should be evaluated more subjectively over a longer time horizon than is typically used. In this respect, international joint ventures require a more balanced, often-subjective approach if their promise is to be realized.

Lee and Beamish (1995) examined the characteristics and performance of 31 IJVs from Korea operating in LDCs. Several key findings were found to be different from those on IJVs from developed countries operating in LDCs. In terms of performance, a higher satisfaction level and higher stability rates were reported for Korean IJVs than IJVs from developed countries. Control and partner needs were positively related to performance (measured in terms of satisfaction level) while commitment was not significant. These findings on control and commitment were different from previous findings on developed countries-sponsored IJVs.

Glaister & Buckley (1999) have studied UK parents of international alliances with partner firms from Western Europe, US and Japan, formed since 1980 and made two subjective performance measures - parents subjective level of satisfaction with the alliance's overall performance and subjective measures based on cost-benefit analysis. Authors identify the relationships between measures of JV performance and a set of ex-ante and ex-post variables that have a potential effect on alliance performance. From the prior literature, authors identified four ex-ante variables as having a potential effect on alliance performance: cultural distance, previous relationships between the alliance partners, depth of analysis preceding the formation of the alliance, and whether or not the partners actively compete.

Glaister & Buckley (1999) hold that, one contentious issue in measuring performance of joint ventures is the appropriate yard-stick(s) to be used when assessing organizational performance. Essentially, this debate revolves around the appropriateness of traditional financial measures (for example ROI, growth) as providing a true yardstick of performance and the extent to which other indicators are relevant (such as maximizing shareholders' wealth, qualitative returns to non-financial stakeholders such as customer satisfaction).

According to Philippe Lassere (1999), the measures of IJV performance are survival or dissolution through liquidation or acquisition and satisfaction of partners. Objective measures for performance or success are return on investment, growth, market share, shareholder value. Lassere's conceptual model is based on "Transaction Cost Theory". The model states that an organization will be efficient if it achieves individual partner's objectives (where partners are obliged to co-operate) and if co-operation costs (transaction costs) are minimized given uncertainty and opportunism. Previous research has found that subjective assessments of performance correlate well with objective measures (Geringer and Hebert 1991). Pearce and Hatfield (2002) have measured performance in terms of partner company goal achievement. The use of partner goal achievement allows for divergent partner goals and inclusion of non-financial, as well as financial goals (Jain and Jain 2004). The most frequently used measure of JV performance is managerial perception of partner satisfaction or partner goal achievement (Beamish 1994, Killing 1983). One partner's success criteria are often different from those of the other partner. Managerial assessment measures permit the

assessment of specific and disparate goals (Hatfield and Pearce 1994). Partner goal achievement, which is directly related to partner satisfaction, offers a means to address these differences in success criteria in a more precise fashion. Gomes-Casseres (1987) identified duration and survival to be unacceptable measures of performance because termination of a JV may be the result of success, failure or environmental change. Non-financial performance criteria show promise for measuring JV performance. Managerial assessment is a valuable complement to, and sometimes a necessary substitute for financial indicators as appropriate measures of JV performance.

The traditional approaches to performance evaluation offer a diverse set of measures. However, they omit an aspect in which both company managers and business theoreticians are now paying increasing attention – learning (Mody 1993, Buchel and Prange 1998, Inkpen and Crossan 1995). The learning view of evaluation combines an output-oriented approach with a process approach. It takes into account on the one hand the acquisition of knowledge and the attainment of learning goals, and on the other, the learning processes, which support these ends (Buchel and Prange 1998). Typical measures of this perspective are the acquisition of technological know-how, market know-how or management know-how.

Dussauge & Garrette (1995) linked IJV performance to the choice of a more structured configuration of alliances. Resource complementarity is another important determinant of joint venture performance. The higher the degree of balance in partners' contributed resources, the greater is the level of achievement of a joint venture. This provides further empirical support for previous studies (Awadzi et al. 1988, Lee and Beamish 1995).

The greater the past experience of parents, the higher the levels of joint venture success. Experience in JVs can provide a basis for sharing skills and capabilities and managing to resolve difficult issues (Harrigan 1988). While such experience mitigates local knowledge disadvantages and enhances IJV performance, Luo (1995) have pointed out that the impact of experience is contingent on the length of the JV experience and the presence of a local partner. The greater use of IJVs by a partner firm also indicates its commitment to this mode of market entry, and so found to be correlated to performance (Beamish 1994) enhancing its capability to manage JV relationships successfully. Several firm related factors influence the stability and performance of IJVs. Previous literature suggests that asymmetry in partners' firm size and multinational extent has negative effects on the stability of the JV. Geringer (1988) and Killing (1983) argued that a venture between a small firm and a giant MNC suffered from mismatches in strategic mission, corporate culture, and level of bureaucracy and would be incompatible. Harrigan (1988) examined these asymmetries in a regression model and found a weak relationship with JV survival or stability.

The degree of cooperation between partner firms is the critical factor in explaining IJV performance and stability for IJVs operating in developing counties.

The results of past studies show that an IJV relationship is unlikely to survive where partner firms are constantly in conflict over policy, managerial and operational issues relating to the IJV. More the partners are in harmony (indicated by less frequent disagreement over policy issues) more stable the IJV. Cooperation between partners seems to be a condition for success of a cooperative joint venture. Awadzi et al. (1988) in their studies of JVs in developed countries and some others in developing countries found some significant correlation between cooperation (or lack of conflict) and performance. Opportunistic behavior by one party can ruin joint venture harmony and create disagreement and conflicts. Cooperation is the key ingredient for a stable and successful joint venture relationship (Sim and Ali 1998).

Several industry-related factors, such as industry growth, industry structure, technology, product-market and competitive factors, have an influence on IJV preference and performance (Luo 1995, Kogut 1988, Harrigan 1988, Franko 1971, Hennart 1991, Gomes-Casseres 1987). Two factors (nature of technology and export orientation) are particularly pertinent in a developing country context, as direct foreign investment and JVs are routes to technology transfer and export development (Jain and Jain 2001). In developing countries, mature or standardized technology would be more appropriate and would not be a source of contention for control of proprietary technology between partners. The reverse would be true for sophisticated technology. Parents' JV experiences, degree of resource complementarity, degree of cooperation between partners and export-orientation of JV have a positive impact on perceived performance while high technology has a negative impact.

RESEARCH METHODOLOGY
Sample Selection and Data
The scope of this paper includes joint ventures in Indian automotive sector with atleast one foreign partner and one Indian partner. Stratified random sampling is used for collecting data. IJVs from automobile manufacturers and automotive component manufacturer organizations are selected for the study. There are about 36 major automobile manufacturing ventures in India that have foreign participation. Of these, 30 are joint ventures and the remaining wholly owned subsidiaries. In addition, there are more than 300 auto component IJVs. The present study is based on the primary data collected from these IJVs. The automotive industry sector is generally considered very dynamic in terms of environmental conditions.

In this study, all the 30 automobile manufacturing IJVs and, based on purposive and convenience sampling, 70 automobile component manufacturing IJVs are selected. The paper is based on the empirical analysis of the data collected through a structured questionnaire for the study. The variables for these parameters are chosen from literature and selected for the Indian context to build a questionnaire, which is

administered to the top executives of automotive industry. The responses are analyzed to come with the results. Multiple questionnaires are sent to all these joint ventures depending on their size. The number of questionnaires mailed for response ranged from 1 to 10 for each international joint venture. A total of 850 questionnaires are sent across to 100 IJVs. Responses came from 50 IJVs out of the 100 IJVs contacted. The sample of the respondents consists of 161 top-level management executives from corporate affairs, strategic planning, finance, and various departments of 50 different organizations. It came from 104 respondents from automobile manufacturing and 57 respondents from automobile component manufacturing IJVs. Thus, the organization response rate is 50% and individual response rate is 18.94%. In terms of sector wise break up for response, 70.00% automobile manufacturing organizations (i.e., 21 out of 30) and 41.43% automotive component manufacturing organizations responded (i.e., 29 out of 70).

Each organization chosen in this study is a medium to large-scale international joint venture. Potential respondents are selected from all ranges of age and experience in this industry and the present organization. Headquarters of the organization are included to get the response from the leaders who are involved in joint venturing decisions. Data is gathered over a period of six months. Method used for data collection is questionnaire-based survey, which is complimented by interviews in the research setting and by secondary data sources and analysis. The sample includes both automobile manufacturers and automotive component manufacturers. The geographic locations of the respondents vary from important metros to automobile hubs in India. The cities from where the sample for the study comes are Delhi, Mumbai, Pune, Gurgaon, Faridabad, Noida, Chennai, Indore (Pithampur), Bangalore and Calcutta. This clearly shows that the sample is representative.

The present study uses secondary data as well. Personal interviews and discussions with experts and practitioners are carried out. The secondary data sources related to IJVs in automotive sector include Society of Indian Automobile Manufacturers (SIAM), Automotive Research Association of India (ARAI), Automobile Component Manufactures Association (ACMA), Confederation of Indian Industry (CII), CMIE data base, SIA newsletter, other institutions, Top 500 list of companies published in BT-500 (Business Today-500), Economic Times, Financial Express, and related internet sites. It is found that most of the organizations are skeptical about sharing the information. Organizations are reluctant to reveal many details, especially in this area of research of strategic importance and value. Few of the joint venture organizations are undergoing restructuring process, which also hampered the data collection. Most of the joint ventures responded favorably.

Respondents are asked to indicate the appropriate choice by considering their IJV organization processes. Respondents' perception on each statement about degree of importance or contribution of the item to the total is evaluated on a 5-point Likert

scale. The primary data collected for the study through the questionnaire is analyzed in two steps. Descriptive statistics of variables are prepared and factor analysis is used to make components or factors from the responses to the items administered in the questionnaire. It is analyzed using SPSS. Factor analysis followed by reliability analysis is used to factorize the variables in homogenous factors and check the internal consistency of the factors. Path modeling technique is used to define relationships and model these factors using Structural Equation Modeling (SEM) with AMOS (Analysis of Moment Structures) software package.

FINDINGS AND RESULTS
Descriptive Statistics of Response

The performance evaluation criteria of IJVs can be described in simple statistics with the average of responses on a five-point Likert scale. This is presented in Table 1 for the items administered for measuring IJV performance in this study. The statistics shows mean, standard deviation, variance, mode, range, minimum and maximum for the items.

Table 1. Statistical Results of Analysis of IJV Performance Criteria

Variable	Mean	Std. Deviation	Variance	Mode	Range	Minimum, Maximum
Customer satisfaction	4.36	0.85	0.719	5	3	2, 5
Market share	4.25	0.72	0.516	4	4	1, 5
Sales turnover	4.14	0.76	0.573	4	3	2, 5
Satisfaction of partners	3.97	0.90	0.805	4	4	1, 5
Return on equity	3.96	0.66	0.436	4	3	2, 5
Rate of return on capital employed	3.94	0.69	0.471	4	2	3, 5
State of organization	3.83	0.84	0.707	4	3	2, 5
Increase in product range	3.83	1.03	1.057	4	4	1, 5
Employee satisfaction	3.58	0.90	0.807	4	4	1, 5
Capacity expansion	3.45	0.89	0.787	3	4	1, 5
P/E ratio	3.33	1.04	1.085	4	4	1, 5
Exports as % of sales turnover	3.31	1.07	1.140	4	4	1, 5
Age of IJV	3.06	1.01	1.016	3	4	1, 5

The mean from the table statistics shows that most important parameter for the measure of performance of an international joint venture is "customer satisfaction." Also, maximum number of respondents (54.7%) has replied a score of 5, "extremely important," for this criterion. In any single parent organization, financial parameters are the top parameters for the measure of performance. But, satisfaction of partners and customers takes a higher priority in IJV along with market share and sales turnover. Mean of financial parameters like return on equity (ROE) and rate of return on capital employed (ROCE) are also coming very close but the number of respondents giving them a score of 5 is only 20.5% and 19.3% respectively. This shows that financial parameters constitute important measure of performance for international joint ventures but the satisfaction of partners and customers is much more important as perceived by international joint ventures. This is also validated in the factor analysis that follows.

Exhibit 1 shows the radar diagram for International Joint Venture Performance Criteria. Starting from "customer satisfaction," the criteria move clockwise in a descending level of importance. This is a pictorial representation of averages achieved above.

Figure 1. Radar Diagram –
International Joint Venture Performance Criteria
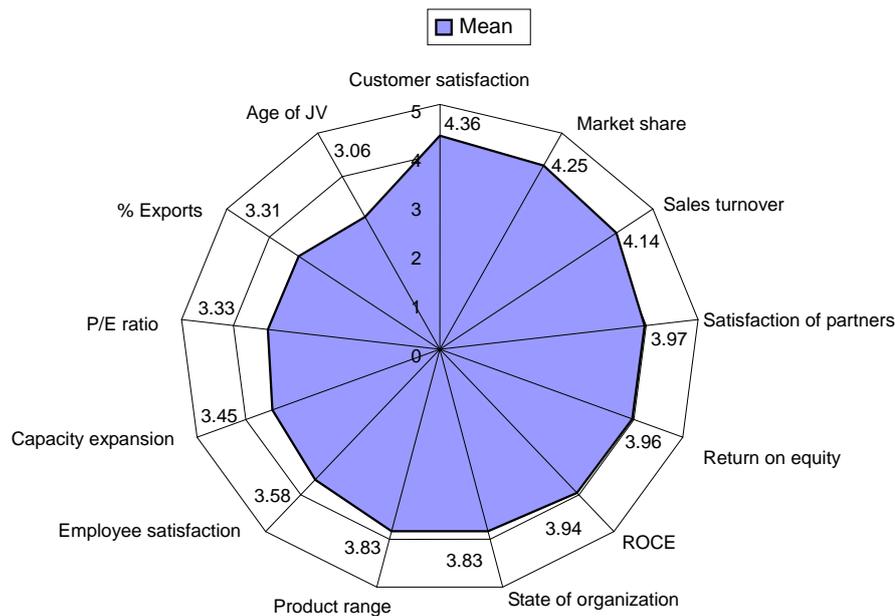
Analysis of IJV Performance Evaluation Criteria

Earlier research studies have used a variety of financial indicators, objective and subjective measures of performance for IJV performance evaluation. Yet, these measures embody potential limitations that are critical to evaluation of IJV performance. The increasing popularity of JVs has underscored the importance of a difficult question about how to assess the performance of a joint venture. To further complicate the picture, joint ventures are especially likely to be used in risky, uncertain settings. In such an environment, any business is difficult to evaluate because profit is a long-term proposition and because there are no performance baselines for comparison. Finally, many IJVs are not intended to fill standard business objectives (such as making profits). Instead, they are created to learn a technology, open a market, "keep a window" on an opportunity, or block a competitor. It is not easy to assess how well an international joint venture meets qualitative objectives such as these.

This research paper has used Factor Analysis for factor or component extraction from various variables studied to give meaningful components for selecting performance evaluation criteria of IJVs. Factor analysis uses the correlation matrix to determine which sets of variables cluster together. Here it is done for the importance of IJV performance evaluation criteria and then establishing interactions between them.

The components extracted define the performance evaluation criteria and give a priority to them. The total variance explained by the components in factor analysis for IJV performance criteria is tabulated below in Table 2. The extraction method used is Principal Component Analysis (PCA). Table 2 shows the factor analysis results. The eigenvalues are proportion of the total variance in all the variables, to that accounted by this factor. A factor's eigenvalue may be computed as the sum of its squared factor loadings for all the variables. A factor's eigenvalue divided by the number of variables (which equals the sum of variances because the variance of a standardized variable equals 1) is the percent of variance in all the variables that it explains. The ratio of eigenvalues is the ratio of explanatory importance of the factors with respect to the variables. If a factor has a low eigenvalue, then it is contributing little to the explanation of variances in the variables and may be ignored as redundant with more important factors. Table 2 shows 4 factors extracted, through SPSS package, for analysis under the Extraction options, which are factors with eigenvalues of 1.0 or higher according to the Kaiser rule.

The "Rotation Sums of Squared Loadings" give the eigenvalues after rotation improves the interpretability of the factors. Varimax rotation is used, which minimizes the number of variables that have high loadings on each given factor. The total percent of variance explained is the same even after rotation, but rotation changes the eigenvalues for each of the extracted factors. That is, after rotation each extracted factor counts for a different percentage of variance explained, even though the total

variance explained is the same.

Table 2. Total Variance Explained–
IJV Performance Evaluation Criteria

Component	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.004	23.109	23.109	2.184	16.796	16.796
2	2.171	16.700	39.809	2.034	15.645	32.441
3	1.559	11.991	51.800	1.995	15.348	47.789
4	1.282	9.858	61.658	1.803	13.869	61.658

Extraction Method: Principal Component Analysis

These results show that four components explain 61.66% of the variance. Based on this table, four components are derived each explaining 16.8, 15.65, 15.35 and 13.87% of variance. These components are listed using orthogonal rotation and looking at the rotated component matrix, where varimax method for latent root detection of factors is used. Table 3 presents the factor loadings of the components. The factor loadings, also called component loadings in PCA, are the correlation coefficients between the variables (rows) and factors (columns).

Table 3. Rotated Component Matrix –
IJV Performance Evaluation Criteria

Variable	Component			
	1	2	3	4
Rate of return on capital employed	-0.088	0.180	0.810	0.182
Return on equity	-0.073	0.142	0.838	-0.059
P/E ratio	0.132	-0.058	0.674	-0.054
Capacity expansion	0.189	0.223	-0.021	0.767
Increase in product range	0.145	0.753	-0.190	0.210
Sales turnover	-0.278	0.419	0.171	0.491
Exports as % of sales turnover	0.082	-0.093	0.023	0.767
Market share	0.060	0.644	0.222	0.082
Customer satisfaction	0.266	0.730	0.190	-0.215
Employee satisfaction	0.585	0.367	0.045	0.261
Satisfaction of partners	0.828	0.058	0.076	0.071
State of organization	0.795	0.246	-0.022	-0.115
Age of IJV	0.547	-0.174	-0.151	0.404

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 7 iterations

The factor loadings are the basis for imputing a label to different factors. Looking at the rotated matrix, the first factor has significant loading (greater than 0.5) from four variables, and has a low loading for others. Because these items load on the same factor, this is a justification for combining these items in a component that might be called the factor name that's being provided below. Similarly, other components are provided with the factor names. These variables have been loaded on a factor loading of greater than 0.5. The performance evaluation criteria for an IJV have mainly four components derived from factor analysis. These factors or components can be consolidated and named, depending on variables present as follows.

1. **Partner Interaction Parameters**: Satisfaction of partners, State of organization, Employee satisfaction, Age of IJV

2. **Customer & Product Dynamics**: Increase in product range, Customer satisfaction, Market share

3. **Financial Performance Measures**: Return on equity, Rate of return on capital employed, P/E ratio

4. **Company Turnover**: Capacity expansion, Exports as % of sales turnover, Sales turnover

Similar to the results achieved above, Buchel and Thuy (2001) also recommend four approaches for evaluating performance of joint ventures: economic, strategic, behavioral and learning approach (Buchel and Prange 1998). Economic approaches are generally output-oriented with the purpose of deciding whether international joint ventures are increasing the value of the partner companies. The third factor "financial performance measures" is economic approach. The theoretical base for the economic approach to performance evaluation is found on the theory of financial and capital markets and involves examining measures such as return on investment or capital employed, net yearly profit, return on equity or increases in shareholder value.

Like the financial perspective, "customer & product dynamics and company turnover" primarily emphasizes output criteria from strategic aspect. Different from the financial perspective, it considers outputs of a longer time frame or strategic view. Important performance evaluation criteria from a strategic point of view are increase in market share or company size by capacity expansion, product-range, exports, or the competitive position of the firm by more customer satisfaction. The strategic approach also focuses on broadening core competencies.

The behavioral perspective for performance evaluation is "partner interaction perspective" and emphasizes on the conduct and satisfaction of partners in the IJV. This approach focuses on processes within the IJV, rather than the output criteria. These process-oriented performance measures are not based on specified output goals, but on an evaluation of the company's internal transformation by partner satisfaction and good state of organization, which would increase the life of IJV. Indicators for these, include the development of trust, commitment, transparency, clear responsibility,

the ability to deal with conflicts and continued survival of the IJV.

The discussion of each of these factors from statistical results follows. Reliability analysis is also done for each factor using covariance matrix method. This further validates the internal consistency of factors. The various reliability coefficients and item-total coefficients for these variables (items) to the factors (total) are tabulated using SPSS package and listed below in Tables 4, 5, 6 and 7.

Partner Interaction Parameters

From Table 3, the first factor has highest loadings of 0.828 and 0.795 on 'Satisfaction of partners' and 'State of organization' respectively. This clearly implies that these are major performance criteria. Table 4 depicts the mean value of the responses of this factor, item to total correlation and alpha if the item is deleted. Findings indicate some items are perceived stronger than others. Satisfaction of partners has the highest mean value of 3.97. The mean value of 'state of organization' is next in mean ranking with mean value of 3.83 further proving their importance. 'Employee satisfaction' and 'age of IJV' are lower than the overall average of 3.61 suggesting that they are perceived to be low as compared to other objectives. The reliability coefficients for the 4 items in this factor are as follows.

Table 4. Partner Interaction Parameter – Item Total Statistics

S. No	Item	Mean (Scale: 1 to 5)	Item-Total Correlation	Alpha if Item Deleted
1	Satisfaction of partners	3.97	0.5982	0.5574
2	State of organization	3.83	0.5619	0.5864
3	Employee satisfaction	3.58	0.4550	0.6484
4	Age of IJV	3.06	0.3404	0.7289

Alpha = 0.6967   Standardized item alpha = 0.7053

Although the alpha value would improve marginally on deletion of 'Age of IJV', but its presence is proved by its loading of 0.547 on this factor. Also, results of an earlier study by Geringer and Hebert (1991) of IJVs in USA and Canada showed that successful IJVs are more stable and survived longer. This means that age of IJV becomes a proxy for performance of IJV and proving its presence.

In any collaborative organization, there are always two or more partners concerned. According to the theory of economics, the two parties work together only if both gains from the relationship. This suggest that the two partners in an international joint venture continues the relationship if they are satisfied with the performance of IJV. Thus, satisfaction of partner becomes a direct measure of IJV performance. Satisfaction of partners drives a good state of organization by keeping harmony between the partners. Good state of organization gives good results for it.

This in turn gives satisfaction to employees working there, as they look their growth with IJV's. This increases the life of IJV and which again brings in more satisfaction to the partners completing the satisfaction-performance loop in an IJV. Thus, these partners' related criteria determine performance of an IJV most strongly. This factor comprising of "satisfaction of partner", "state of organization", "employee satisfaction" and "age of IJV" can be called ***partner interaction parameters***.

Customer & Product Dynamics

The variables on customer and product dynamics factor have been listed from loadings of Table 3 which is showing a loading of 0.730 and 0.753 for 'customer satisfaction' and 'Increase in product range' respectively. Table 5 depicts the importance ratings given by the respondents. The reliability coefficients for the 3 items in this factor are as follows.

Table 5. Customer & Product Dynamics – Item Total Statistics

S. No	Item	Mean (Scale: 1 to 5)	Item-Total Correlation	Alpha if Item Deleted
1	Customer satisfaction	4.36	0.5107	0.4365
2	Market share	4.25	0.3886	0.6081
3	Increase in product range	3.83	0.4548	0.5385

Alpha = 0.6318   Standardized item alpha = 0.6392

Results show that 'customer satisfaction' has the highest mean value of 4.36 followed by 'market share' with 4.25. These two are the highest on rank ordering of mean values for al the criteria in instrument. Also, they are higher than the overall average of this factor. Thus, customer satisfaction directly governs the performance ratings for an organization. 'Increase in product range' has got mean value 3.83, which is lower than the overall average of 4.15 for this factor, but sufficient enough to be taken into consideration. Organization caters to a particular market and provides product or service to that market. Product and a market for that product are central to the existence of any organization, be it a joint venture. Increase in the product range or market share of an IJV reflects its performance. Also, this end product is for a group of customers. The customer would not value the product and buy it if he is not satisfied with it. Thus, "satisfaction of customers", "market share" and "increase in product range" are related performance criteria for an IJV. Looking at the interaction of these variables, these are called ***customer & product dynamics.***

The value of alpha for this factor, "Customer & Product Dynamics", improves from 0.6318 to 0.6694 if "employee satisfaction" is also taken into this component. The loading of this variable on the factor is 0.367, which is less than the required loading of 0.5 for a high significance of variables. But it's not so insignificant to delete

because it is improving the alpha value. Also, all the variables in the component are customer oriented and employee is a part of that customer base. Thus, employees can really affect the customer views and perceptions and "employee satisfaction" could be a part of this component.

Financial Performance Measures
Performance of any organization is always measured by the financial impacts of the business. The financial measures used are rate of returns, cost position or net profits accrued by the business. Similarly, in IJVs also financial factors play equally important role. Lassere (1999), Shiva Ramu (1997), Anderson (1990), Geringer (1991), Tomlinson (1970), Lecraw (1983) and many other authors have used financial measures for evaluating performance of IJVs. Third factor for measures of performance of IJVs in this research have these parameters. Rate of return on capital employed, return on equity and P/E ratio are some financial parameters that are criteria for assessing the performance of international joint venture with loadings 0.810, 0.838 and 0.674 from Table 3. These can be put together and the factor can be called *financial performance measures.*

Respondents' replies indicating the level of importance on a 1 to 5 point scale shows that financial performance measures are having an intermediary mean values ranging from 3.33 to 3.96 with an overall average of 3.74 as shown in Table 6. This clearly shows that financial measures are important enough not to get ignored but are not the most important. Thus, presence of this factor shows a definite concern of parents for financial impacts from the business. The reliability coefficients for the 3 items in this factor are as follows:

Table 6. Financial Performance Measures – Item Total Statistics

S. No	Item	Mean (Scale: 1 to 5)	Item-Total Correlation	Alpha if Item Deleted
1	Return on equity	3.96	0.5990	0.4120
2	Rate of return on capital employed	3.94	0.5104	0.5039
3	P/E ratio	3.33	0.3587	0.7924

Alpha = 0.6471   Standardized item alpha = 0.6997

The value of alpha for factor 3, Financial Performance Measures, is 0.6997. The factor loading for P/E ratio in this component is 0.674, which is greater than the required 0.5. Thus P/E ratio, being a financial measure, would be included in organization financial performance measures factor even if deletion of this variable would improve the alpha value of the factor to 0.7924. This also shows that weightage of P/E ratio is very less in the factor. The fact that the most important variable (from highest item-total correlation) in this factor is "return on equity" (ROE) proves that

IJVs are equity-based organizations and view equity as an important consideration for decisions. Thus, rate of return on capital employed (ROCE) and ROE are more important financial performance measures for international joint ventures.

Company Turnover

Capacity expansion, Sales turnover and Exports as % of sales turnover are some of the production outputs of any manufacturing organization. These are also the criteria that are used to measure the performance as per respondents in Table 7. Sales turnover has the highest mean value of 4.14. The reliability coefficients for the 3 items in this factor are as follows:

Table 7. Company Turnover – Item Total Statistics

S. No	Item	Mean (Scale: 1 to 5)	Item-Total Correlation	Alpha if Item Deleted
1	Sales turnover	4.14	0.2700	0.5557
2	Capacity expansion	3.45	0.4938	0.2074
3	Exports as % of sales turnover	3.31	0.3253	0.5133

Alpha = 0.5407   Standardized item alpha = 0.5481

Need for capacity expansion occurs if there is a higher demand, than anticipated, of the product in market. This increases the sales turnover or exports – if the product is catering to a foreign market. Thus, these three are correlated performance criteria and can be clubbed together to make a factor **company turnover.**

The most important factor for the measure of performance of an IJV is the partner interaction parameter. This is the same as has been given by previous authors in literature. Philippe Lassere (1999), Geringer & Hebert (1991) and Glaister & Buckley (1999) gives satisfaction of partners with the overall performance of the IJV as a performance evaluation criteria for an IJV. This shows that for a JV, long-term perspectives are given more priority and, thus, partner related factors are given more importance in deciding its objectives also.

The next important factor is related to customer & product attributes. This shows that customer satisfaction also plays a very vital role in deciding performance of joint venture. Thus, qualitative returns to non-financial stakeholders such as customer satisfaction guide most of the important decisions in today's customer-centric organizations. Next important is "financial measures" and then organization production indicators.

The Cronbach alpha value for the reliability analysis is much greater than 0.5 for all the factors showing statistical acceptance of the factors giving performance criteria for IJVs. The item-total statistics proves that these items completely specify a particular factor, as the value of alpha could not be improved further by addition or

deletion of any item.

Structural Equation Modeling

Structural Equation Modeling is used in this study to find and test complex relationships amongst observed (measured) variables and latent (unobserved) variables and amongst the latent variables themselves. In this section, observed (measured) variables are the various performance criteria of the IJVs, to which respondents have given response in the questionnaire administered to them. The latent (unobserved) variable is the overall measure of performance of the IJV.

AMOS (Analysis of Moment Structures) has been used to make Structural Equation Models, namely confirmatory factor analysis and structural models with latent variables. It takes into account the modeling of interactions, non-linearities, correlated independents, measurement error, correlated error terms, multiple latent independents each measured by multiple indicators, and one or more latent dependents also each with multiple indicators. Critical necessary conditions for SEM models to be depicting the fit of models are explained.

Structural Equation Modeling of IJV Performance Evaluation Criteria

The structural model for international joint venture performance evaluation criteria is developed using measured and latent variables, which are input from factor analysis discussed above. The notation used for denoting variables in the model for IJV performance criteria of automotive joint venture in India are as follows:

Measure of Performance: Measure of Performance of Automotive Joint Venture in India

Perf1: Partner interaction parameters (Employee satisfaction, Satisfaction of partners, State of organization, Age of IJV)

Perf2: Customer & Product dynamics (Increase in product range, Market share, Customer satisfaction)

Perf3: Financial performance measures (Rate of return on capital employed, Return on equity, P/E ratio)

Perf4: Company turnover (Capacity expansion, Sales turnover, Exports as % of sales turnover)

Perf1, Perf2, Perf3 and Perf4 are observed endogenous variables derived from the questionnaire items. These performance factors are derived from the factor analysis in last section. "Measure of performance" is unobserved endogenous variable in the model. The unobserved exogenous variables are denoted by e1, e2, e3, e4 and e5. The model developed, shown in Exhibit 2, for the international joint venture performance evaluation criteria is recursive. The degrees of freedom are equal to number of distinct sample moments minus number of distinct parameters to be estimated. It is done as shown below.

The number of distinct sample moments=10
Number of distinct parameters to be estimated=8
Therefore, degrees of freedom=2

The statistics of significance for this model are reported in Table 8 as the maximum likelihood estimates. Minimum for the model is achieved. The standardized estimates of the model show the standardized regression weights and squared multiple correlations for respective factor objectives.

Table 8. Maximum Likelihood Estimates

Regression Weight		Estimate	S.E.	C.R.
Perf1 ⟵	Measure of Performance	1.000		
Perf2 ⟵	Measure of Performance	1.191	0.446	2.670
Perf3 ⟵	Measure of Performance	0.333	0.168	1.982
Perf4 ⟵	Measure of Performance	0.820	0.285	2.877
Standardized Regression Weight		Estimate		
Perf1 ⟵	Measure of Performance	0.513		
Perf2 ⟵	Measure of Performance	0.608		
Perf3 ⟵	Measure of Performance	0.181		
Perf4 ⟵	Measure of Performance	0.422		
Squared Multiple Correlation		Estimate		
Perf4		0.178		
Perf3		0.033		
Perf2		0.370		
Perf1		0.263		
Variance		Estimate	S.E.	C.R.
e1		0.320	0.056	5.713
e2		0.276	0.068	4.061
e3		0.374	0.043	8.688
e4		0.355	0.050	7.155
e5		0.114	0.054	2.107

S.E.: Standard Error   C.R.: Critical Ratio

The value of residual variance (e5) for the aggregate measure of performance for IJV is only 0.114 showing that only this is the unexplained variance due to all unmeasured causes. This also shows that 88% of original variability in IJV performance evaluation criteria is explained by this model. Thus, these 4 factors define

the performance of IJV up to a large extent. The standardized regression weight, showing the degree of relationship, for each factor – partner interaction, customer & product dynamics, financial performance measures, company turnover - are 0.51, 0.61, 0.18 and 0.42, respectively. The values of these regression weights shows that all these performance factors are positively related to the performance of IJV i.e. more are the values for these factors, better is the performance of IJV. Also, it statistically proves that customer and product dynamics factor with a value of r=0.61, is highly related and affecting the most, followed by partner interaction (r=0.51), company turnover (r=0.42) and financial measures (r=0.18). None of these regression weights has critical ratios (CR) < 1.96 showing that these items are all significant.

Figure 2. Measure of Performance for International Joint Venture in India
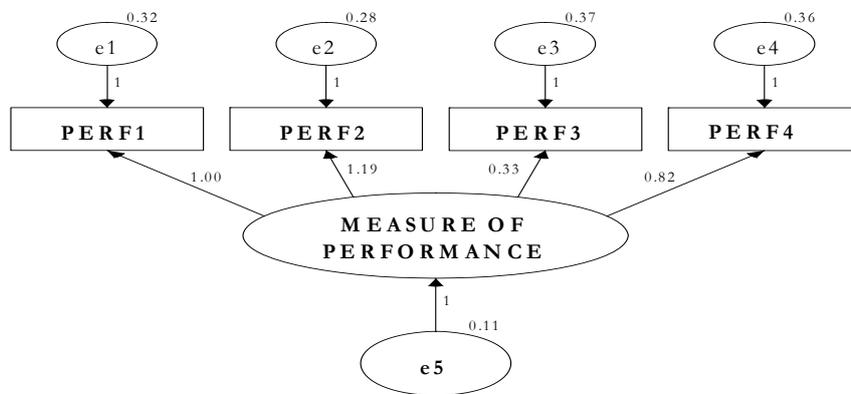
(A) Unstandardized Estimates
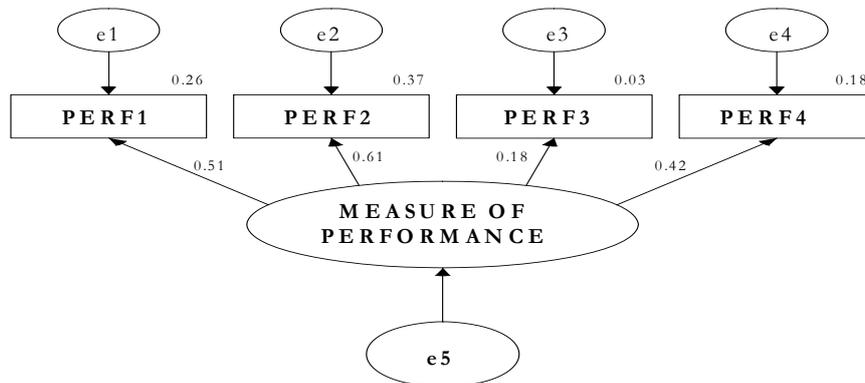
(B) Standardized Estimates

As it can be seen from the model statistics from Table 9, the degrees of freedom for estimation of performance evaluation criteria model is 2 and so model is identified. Also, the model is recursive.

Table 9. Statistic Summary of IJV Performance Evaluation Criteria Model

Statistic	Value
Chi-square, CMIN	4.110
Degrees of Freedom, DF	2
Probability level, P	0.128
Relative chi-square, CMIN/DF	2.055
Root Mean square Residual, RMR	0.017
Goodness of Fit index, GFI	0.988
Root Mean Square Error of Approximation, RMSEA	0.081

The chi-square statistic for the model is 4.110 at probability level of 0.128. The relative chi-square (Chi-square/DF) value is 2.055, which is well within the statistical limit of 3. RMR is 0.017 and RMSEA is 0.081. This accepts the null hypothesis that the model fits the data (representative of the population) better than the baseline model. Goodness of fit statistics is in acceptable range. Thus, it can be inferred that the model fits the data acceptably and the IJV performance evaluation criteria have been statistically modeled using the factors created from factor analysis.

CONCLUSION

The paper elaborates on the results for the most appropriate and corrects measure of international joint venture performance. It explains the importance of IJV performance evaluation criteria in an international automotive joint venture in India from the list of most probable criteria. IJVs can be assessed to be performing or otherwise by several criteria.

These items of international joint venture performance evaluation are factored into broad components that can depict the assessment of performance of an IJV. Factor analysis gives the factors from the list of criteria. An item is included in the factor when the loading of that item is above 0.5. The Cronbach coefficient alpha is used to test the internal consistency and reliability of the scales for the factors. A scale having a reliability coefficient of 0.5 and above is included in the study. Factor analysis followed by reliability analysis confirms the most appropriate performance assessment factors as discussed in the above sections. These factors for performance of IJVs are summarized below.

Result from the paper shows that IJV performance evaluation criteria can be

classified in four dimensions and evaluated in terms of:
1. Partner interaction parameters
2. Customer & Product dynamics
3. Financial performance measures
4. Company turnover

Interaction effects of these factors are studied through structural equation modeling whereby complex relationships amongst observed (measured) variables and latent (unobserved) variables and amongst the latent variables themselves are considered. Statistical package AMOS (Analysis of Moment Structures) has been used to make Structural Equation Models. These structural models represent confirmatory factor analysis and the modeling of interactions, non-linearities, correlated independents, measurement error and correlated error terms. Despite the simplicity of the model, it provides substantial information on the performance evaluation criteria of international joint ventures. In essence, the performance criteria in international automotive joint ventures in India are inter-dependent and correlated. This is depicted, in Exhibit 2, by the model for the performance evaluation factors in international joint venture. Structural equation modeling using AMOS gives a model with these four factors for measuring the performance. Path model gives the relationship and interaction amongst measured and latent variables.

The results suggest that the most important factor for the performance evaluation of an IJV is partner interaction parameter. In any single parent organization, financial parameters are the top parameters for this measure. But in IJV, satisfaction of partners and partner dynamics take a higher priority. The results show that for an IJV, long-term perspectives are given more priority and, thus, partner related factors are given more importance in deciding its objectives also.

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