

# ORGANIZATION DESIGN AND PERFORMANCE: EVIDENCE FROM INDIA

Arabinda Bhattacharya, University of Calcutta  
Amit Kundu, School of Management Studies, Techno India

## ABSTRACT

*Research on organization design, its transformation, change management, organizational restructuring for the last two decades makes it a challenging and complex research area. The central problem is to design organizations for superior performance on the basis of mechanisms such as uncertainty, differentiation and integration. The design-performance relationship is also dependent on the business environment as well as the business sector. This study examines the Chemical; Petro-chemical Process Industry; Agricultural related Industry; Processed Food Industry and Bio-Chemical related Industry. It is important to understand the measures of organization design parameters on the performance of the organizations. The objective of this study is to identify homogeneous groups present in the sector to develop a mathematical functional form for establishing the relationship between organization design parameters and performance. It is also intended to examine differences across the groups with respect to the strength of design parameter influence and organizational performance.*

**JEL:** D23

**KEYWORDS:** Organization Design, Performance, India, Chemical Sector

## INTRODUCTION

Organizations, in general, are complex. They are economic entities as they must acquire various human, financial, material and managerial resources. They allocate the resources in an efficient and effective way. The organization, as a social system, has to interact with external entities constantly. Organizations have internal systems and processes which have specific norms and rules, ideals, values, beliefs and practices that govern their behavior. Within the organizations, people interact daily and have specific skills, values, feelings, motivation and feelings. All organizations must maintain their external and internal consistency for growth, sustenance and development.

Given organizational complexity, designing and managing effectively any sizeable organization anywhere is a daunting task (Khandwalla, 1992). It is more difficult in Third World Countries. The reasons for this are many, such as operating environment, shortages of resources, political and bureaucratic interference, and lack of social and physical infrastructural facilities etc. Within these constraints, the achievement of organizational excellence requires specific strategies. The strategic choices also depend on the nature of organizations, their size and also on their operating environment.

The discussion of organizations and its excellence, in this research paper, has specific context. Liberalization of the Indian economy for the last two decades makes it highly dynamic and complex. During the past two decades, India has been moving from an insular, command and planning oriented economy towards an increasingly liberalized, globalized, and market oriented economy (Ray, 2004). India becomes is one of the largest emerging markets with huge potential for sustained economic growth. This research studies the organization design and performance relationships for a specific sector in the Indian Economy. The paper is organized into 5 sections, Literature Review, Research Objectives, Data and Methodology, Results, and Concluding Comments.

## LITERATURE REVIEW

A complex organization is an open social action system consisting of multi-forms of structures and processes. The cyclic repetitive process converts input resources to value added output resources by definite methods/measures. The value of the product/service depends on mainly two facts: a.) development of the structured process with specified predictable patterns is concerned with organization design which should minimize the variability of the output level. b.) Assessment of the environment in which they operate, determines the strategic choices to be made.' Those strategies must "fit" the specific environment. So the process should be configured properly to cope with environmental differences (Andrew H. van de Ven, 1976).

To address the first issue we have to define organization in its design perspective: "An organization is defined as a system of interrelated behavior of people who are performing a task that has been differentiated in to several distinct subsystems, each subsystem performing a portion of task, and the efforts of each being integrated to achieve effective performance of the system." (Lawrence and Lorsch, 1967).

The second issue indicates the compatibility of organization design with the environment: "In varying degrees all organizations are dependent upon their environment for survival. The environment is defined as the organizations and associates in the factor markets that supply an organization with its input resources and the organizations and associates in the product markets that obtain the output products or services from an organization. Uncertainty in the environment in every aspect of situation considers internal and external as well as social, economic and environmental factors etc." (Andrew H. van de Ven, 1976).

Organization design research must compare the efficacy of organizational structures and developmental processes, and organization designers must create methods for implementing effective structures and processes. Organization design has been a central topic in management research. The research indicates that organization design is a dynamic culture and the objective is to develop an effective organization that is both time and environment specific. Completeness of the design can only be possible by the pre-specification of the problem, the identification of pre-fixed alternatives and choosing of the best alternatives. For such a scientific approach, there needs to be a clear and stable boundary between the organization being designed and the context for which it is being designed.

In case the organizations remain static in respect of design parameters they do not become competitive with the changing environment. The challenge of the organization redesign is to shift the organization from their stable state of equilibrium and to make it more dynamic in the future point of view. It is more so in the era of liberalized economic system. Over the last four decade there has been a wide range of research considering change management, organizational restructuring, organizational transformation etc. This literature started with advent of the work of Burns and Stalker(1961), Chandler(1962), Lawrence and Lorsch (1967), Pugh et al.(1968), Galbraith(1973), Khandwalla (1973), Mintzberg (1979), Miller and Friesen(1984), Scott (1995) and more recently in the special issue of Organization Design in Organizational Science (Dunbar and Starbuck,2006).

Dunbar and Starbuck's (2006) question is closely related to a central research objective of organization theory concerning the design of organizations for effectiveness and performance. Two contrasting ideas have been developed to nurture the issues. Contingency model (Lawrence and Lorsch, 1967; Khandwalla, 1977) implicitly assume that high-level performers within an organization are able to point out constraints imposed by the environment and are able to design the organizations in an appropriate way to address those issues. The role of top management /strategist of an organization are, therefore, to respond to the

changing environment in a continuous manner by adapting the necessary changes in the organization (Andrew H. van de Ven, 1976).

The second theme uses a congruence model of organizational design (Randolph and Dess, 1984; Nadler & Tushman, 1997; Russo and Harrison, 2005) to study how internal process influence organizational performance. The research attention has focused on what components to include in designs and how to evaluate design performance. The assumption is that if a design includes the appropriate components, if the relationships between these components are logically consistent, and if they are congruent with organization goals, then the design will perform well. The main emphasis has been given to "alignment" of the design component that should be deemed "fit" for organizational performance and the greater the "congruence", the higher is the performance of the organization. Over time, organization design research has made progress by becoming more specific in identifying the components to be aligned, more detailed in identifying the criteria for evaluating fits, and broader in terms of the range of rigorous research methodologies used to explore ideas about fit. As a consequence, discussions of organization design have grown more complex (Dunbar and Starbuck, 2006).

Hence, the dynamism of the organization redesign makes the field much more attractive towards organization theorists. There are wide scopes to revisit the organization redesign and theorize the concept from different perspectives. To summarize, Nystrom and Starbuck (1981) captured the idea perfectly when they said: "a well-designed organization is not a stable solution to achieve, but a developmental process to keep active."

The work of Lawrence and Lorsch (1967) suggests that differentiation and integration are two major elements of organizational design. To cope more effectively with the diverse contingencies in their task environment, they must differentiate themselves more efficiently and at the same time strive to coordinate their activities by integrating their operations. Thus, we expect that the more the organization has been able to achieve a closure (the greater the reduction in uncertainty it has been able to effect and the clearer the identification it has been able to make of the crucial contingencies in its environment), the more capable it will be of differentiation, and the more differentiated it is, the more it will strive to use integrative mechanisms (Khandwalla, 1973).

It is necessary to understand the state of differentiation in relation to the properties of environment but we have also understand the relationship between two design mechanism, differentiation and integration in complex organization and ultimately how these are related to organizational performance.

Performance is the ultimate criterion in the assessment of organizations. Performance measurement is a complex construct as a number of factors can be used to assess it. A dynamic model has been developed by R.T.Lenz (1981) to portray the relationship between environment, organization design and performance. Based on the task environment, that specified the required output utilizing the indicated input, firms develop internal consistency such as division of tasks, interdependence of departments etc in such a way that it provides the optimum level of performance in that sector. Measurement is also time specific. It would be better to strategize in such a way that the process of co-alignment can occur.

This research study explains the concept of effective firm design/redesign in the Indian context focusing on Chemical; Petro-chemical Process Industry; Agricultural related Industry; Processed Food Industry and Bio-Chemical related Industry. The following issues will be addressed in this research paper: 1. It is important to understand the measures of organization design parameters such as measures of uncertainty, differentiation and integration in relation to those of competitive organizations and the impact of the relative redesign mechanisms on the performance of the organizations. This impact of organization design parameters on performance cannot be reflected in one mathematical functional form because of the heterogeneity nature of the context in which the organizations operate. Therefore, the first objective is to

identify the homogeneous groups. 2. The second objective is to estimate the functional relationship between the design parameters and the organizational performance in case of the individual segments of the sector and to ascertain the nature of the relationship. It is also intended to examine differences across segments in respect to the strength the design parameters influence and organizational performance and also the nature of the relationship among variables considered in the model.

## DATA AND METHODOLOGY

The unit of observation for this study includes the Chemical; Petro-chemical Process Industry; Agricultural related Industry; Processed Food Industry and Bio-Chemical related Industry. The selection of firms were made by exhaustive study of the print version of Economic Intelligence Service named Industry Market Size & Shares published by Centre for Monitoring Indian Economy Private Ltd (CMIE). We attempted to cover all the chemical & chemical related industries in the Eastern Region of India. A total of 68 organizations participated in this study. The data was collected in the year 2011. In 29 cases respondents were reluctant to give the score in regard to design mechanisms for the competitive organizations. Therefore, relative scores for uncertainty reduction, differentiation and integration are available for 39 cases.

Top management of those selected organizations was contacted through telephone or email and was requested to provide the appointment stating the research objectives. A structured questionnaire has developed based on the model of Prof P N Khandwalla (2001) and Prof A Som (2002). Personal interviews were conducted with a structured questionnaire including senior executives who had an adequate knowledge of company's history, business strategy, changes in the business environment and the changes with the organization to discuss over the questionnaire and get his/her perception. The final section of the questionnaire contains the tools to measure organizational performance. The databases of CMIE of the detailed performance report of firms are used as the performance data source for the respective organizations.

Organization design mechanisms are taken as independent variables. From the structured questionnaire, the perception of the respondents on the three redesign mechanism are taken (No. of respondent=175).

All respondents were asked to provide the level of uncertainty for their organizations (it has been indicated as ur12s in the dataset) as well as their close competitor (it has been indicated as ur12c in the dataset) in the rating scale. The ratio of these two values is indicated as relative uncertainty (RUR). That measure is taken as one of the independent variables. Similarly, all respondents indicate the level of differentiation for their organizations (it has been indicated as dr10s) as well as their close competitor (it has been indicated as 10c in the dataset) in the rating scale. The ratios of the two values in both cases are identified as relative differentiation (RDR). All respondents are asked to provide the level of integration for their organizations (it has been indicated as ir10s in the dataset) as well as their close competitor (it has been indicated as ir10c in the dataset) in the rating scale and the ratio of these two values is indicated as relative integration (RIR). The relative measures of three design variables (RUR, RDR, RIR) are taken as independent variables to measure the organizational performance. The sales turnover and capital employed ratio of each organization is taken as performance measures and is indicated as TRNCAPE in the dataset. That value is taken as the dependent variable.

## RESULTS

### Analysis –Stage I

The objectives of the section are stated as follows: 1. Formation of the two clusters based on design parameters, RUR, RDR and RIR. Based on these two clusters, the discriminant function has to be estimated and the discriminant score has been obtained. 2. In this way, the functional relationship

between performance and three design parameters is modeled in terms of performance parameters and the discriminant scores reflecting the effect of three design parameters. And, hence the situations can be shown in two dimensional space, one dimension being performance measures (TRNCAPE) and the other discriminant scores. The analysis consists of following consecutive steps:

Step I: *Cluster analysis* is performed on the basis of relative uncertainty (RUR), relative differentiation (RDR) and relative integration (RIR) and the objective is to form two clusters as shown in Table 2 with relatively homogeneous groups. The two homogeneously distributed groups have been obtained by cluster analysis based on three independent parameters RUR, RDR, and RIR and then, on the basis of these two groups, *discriminant analysis* has been performed.

Step –II: Before that, *normality test* for three parameters relative uncertainty, relative differentiation and relative integration has been performed. Table 1 shows the results. The Kolmogorov-Smirnov Test compares an observed cumulative distribution function to a theoretical cumulative distribution. Normal theoretical distribution is selected in this case. Large significance values ( $>.05$ ) of RUR, RDR and RIR indicate that the observed distribution corresponds to the theoretical distribution. The value of significance indicates that all the independent parameters are normally distributed.

Table 1 Non Parametric Tests

One-Sample Kolmogorov-Smirnov Test				
		RUR	RDR	RIR
N		56	54	49
Normal Parameters (a,b)	Mean	1.178	1.033	1.020
	Std. Deviation	0.5809	0.3146	0.2551
Most Extreme Differences	Absolute	0.174	0.134	0.125
	Positive	0.174	0.134	0.125
	Negative	-0.076	-0.067	-0.073
Kolmogorov-Smirnov Z		1.303	0.987	0.872
Asymp. Sig. (2-tailed)		0.067	0.284	0.433
a. Test Distribution is Normal.				
b. Calculated from data.				

*Non-Parametric Test indicates that three design parameters namely RUR, RDR and RIR are normally distributed.*

Step –III: *Discriminant analysis* has to be performed on the basis of two groups and discriminant scores obtained for each organization. The results are presented in Table 2. The discriminant scores has can be taken as a resultant effect of organization design parameters namely RUR, RDR and RIR.

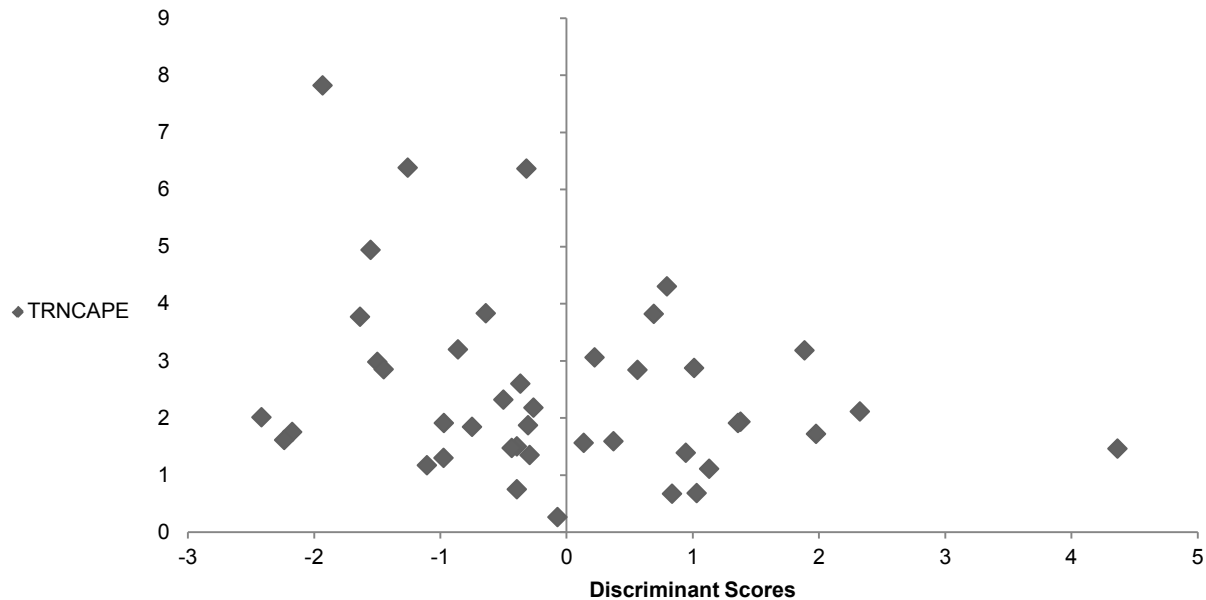
Step IV: The dependent variables TRNCAPE [Turnover/Capital Employed] are plotted against Discriminant Scores in the two dimensional space by the scatter diagram as shown in Figure 1. The scatter diagram cannot establish any relationship between the dependent variable and the discriminant scores.

The scatter diagram is subjectively categorized into three segments on the basis of TRNCAPE & the discriminant scores. After segmentation, we attempt to estimate the relationship between the performance measures of the organization with the organization design mechanism. These three categories of industries are formed subjectively so as to estimate a consistent regression equation as shown in Table 2.

### Analysis- Stage II

The three categories of industries are formed subjectively based on the scatter diagram. The objectives of the section are as follows:

Figure 1 Mapping of the Organizations in Respect of TRNCAPE and Discriminant Scores



*TRNCAPE is indicative of organizational performance and that is represented in Y-Axis. Discriminant scores can be taken as a resultant effect of organizational design parameters, namely RUR, RDR, and RIR, and this is represented along the X-Axis.*

1. The descriptive statistics of the financial performance of three categories give an idea to form the bases of categorization. 2. Regression analysis has been performed directly considering financial performance turnover/Avg. Capital Employed (TRNCAPE) as the dependent variable and the three design parameters relative uncertainty (RUR), relative differentiation (RDR) and relative integration (RIR) as independent variables. In this case, problems of multicollinearity emerge. 3. To reduce this effect, factor analysis is performed and the regression analysis is performed based on three factors F1, F2 and F3.

This stage of analysis consists of following consecutive steps: *Step I:* The analysis of the three groups has been performed on the financial parameters. Turnover/ Avg. Capital Employed [TRNCAPE] is considered as performance parameters and the average value of this parameter are quite different from each other. The results are quite consistent with the subjective categorization of the organizations. The descriptive statistics of all the financial parameters make them validated to use as parameters of measurement of organizational performance of three groups as shown in Table 3.

*Step II:* For each group, the regression analysis is performed directly considering the performance variable TRNCAPE [Turnover/Capital Employed] as the dependent variable with respect to RUR, RDR, and RIR. All the results show high R values, but there would be multicollinearity problems in all the three cases.

*Step III:* To eliminate multicollinearity problems, factor analysis were performed. The main objective is to map RUR, RDR and RIR into three distinct factors namely F1, F2 and F3 which ensures 100% coverage of total variance. Hence, estimation of the functional relation between TRNCAPE and three factors is free of multicollinearity problems. So, three independent variables are absolutely uncorrelated.

Table 2 Three Groups of Specified Sector

nc	qcl 1	dis1 1	trncape	group	nc	qcl 1	dis1 1	trncape	group
1	1	-0.0707	0.26	1	35	.	.	0.82	.
2	2	5.102	.	.	36	1	-1.259	6.38	3
3	1	-2.474	.	.	37	1	0.1398	.	.
4	.	.	1.12	.	38	1	0.1357	1.56	2
5	.	.	2.66	.	39	1	-0.2920	1.35	.
6	.	.	.	.	40	2	2.324	2.11	3
7	.	.	4.72	.	41	1	-0.4998	2.32	2
8	1	-1.498	2.98	2	42	2	0.9451	1.39	2
9	.	.	2.67	.	43	1	-1.635	3.77	2
10	1	0.2227	3.06	3	44	2	0.7955	4.30	3
11	1	-0.3934	1.50	1	45	1	-0.3173	6.36	3
12	2	1.380	1.93	2	46	1	-2.173	1.75	.
13	.	.	1.53	.	47	1	-1.106	1.17	1
14	1	-0.3652	2.60	2	48	2	0.8378	0.67	2
15	2	1.9787	1.72	3	49	1	-1.930	7.82	3
16	1	-2.416	2.01	1	50	.	.	2.05	.
17	.	.	.	.	51	.	.	2.39	.
18	1	-0.6378	3.83	3	52	.	.	3.68	.
19	2	1.886	3.18	3	53	.	.	2.20	.
20	2	0.5635	2.84	3	54	1	-2.236	1.61	1
21	1	-1.447	2.85	2	55	2	1.131	1.11	1
22	1	-0.3044	1.87	2	56	.	.	3.17	.
23	.	.	2.88	.	57	2	1.032	0.68	1
24	1	-0.4339	1.47	2	58	2	1.359	1.91	2
25	.	.	2.37	.	59	1	-0.3934	0.75	1
26	2	0.6917	3.82	3	60	2	0.5130	.	.
27	.	.	1.73	.	61	1	-0.7482	1.84	2
28	.	.	2.95	.	62	.	.	1.23	.
29	1	-0.9716	1.91	1	63	1	-1.377	.	.
30	2	1.0109	2.87	3	64	2	4.3645	1.46	3
31	.	.	2.80	.	65	1	-0.9742	1.30	1
32	1	-1.551	4.94	3	66	1	-0.8598	3.20	2
33	1	-0.2604	2.18	2	67	2	1.8367	.	.
34	.	.	6.83	.	68	2	0.3731	1.59	.

*This table shows the results of discriminant performed on the basis of two groups and discriminant scores obtained for each organization. TRNCAPE is turnover/capital employed. Group is the grouping of firms identified through cluster analysis.*

The mathematical model can be expressed as follows:

$$\text{TRNCAPE} = \hat{\beta}_0 + \hat{\beta}_1 F_1 + \hat{\beta}_2 F_2 + \hat{\beta}_3 F_3 \quad (1)$$

Where  $F_i$ 's are factor scores

Factor is simply a linear combination of the original variables. The factor scores for the  $i$ -th factor may be estimated as follows:

$$\begin{aligned} F_{1i} &= a_1 RUR_i + a_2 RDR_i + a_3 RIR_i \\ F_{2i} &= b_1 RUR_i + b_2 RDR_i + b_3 RIR_i \\ F_{3i} &= c_1 RUR_i + c_2 RDR_i + c_3 RIR_i \end{aligned}$$

The weights, or factor score coefficients, used to combine the standardized variables are obtained from the factor score coefficient matrix

$$TRNCAPE = \hat{\alpha}_0 + \hat{\alpha}_1RUR + \hat{\alpha}_2RDR + \hat{\alpha}_3RIR$$

$$\alpha_1 = (\beta_1a_1 + \beta_2b_1 + \beta_3c_1) \times RUR$$

$$\alpha_2 = (\beta_1a_2 + \beta_2b_2 + \beta_3c_2) \times RDR$$

$$\alpha_3 = (\beta_1a_3 + \beta_2b_3 + \beta_3c_3) \times RIR$$

Table 3: Descriptive Statistics

<b>Panel A: Group I</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Sales Turnover(Rs Million)	10	549.1	212,157	42,890	65,159
Profit after Tax(Rs Million)	10	-98	7,914.9	1,818.6	2,386.7
PBDITA	10	-27.60	22,760	4,761.5	6,788.8
PAT/Avg.Capital Employed	9	-7.61	27.05	10.169	10.942
Capital Employed(Rs Million)	10	2,127.4	163,158	35,106	51,761
Debt-Equity Ratio	10	0.03	4.38	1.355	1.2928
TRNCAPE	<b>10</b>	<b>0.2581</b>	<b>2.006</b>	<b>1.230</b>	<b>0.5568</b>
Valid N	10				
<b>Panel B: Group II</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Sales Turnover(Rs Million)	15	136	306,335	31,789	76,554
Profit after Tax(Rs Million)	15	-339.7	49,882	4,426.5	12,665
PBDITA	15	-124.7	79,902	7,062.1	20,244
PAT/Avg.Capital Employed	15	-9.02	44.42	17.011	15.187
Capital Employed(Rs Million)	15	45.7	159,991	16,166	40,054
Debt-Equity Ratio	15	0.01	1.23	0.3827	0.4043
TRNCAPE	<b>15</b>	<b>0.6748</b>	<b>3.766</b>	<b>2.170</b>	<b>0.7998</b>
Valid N	<b>15</b>				
<b>Panel C: Group III</b>	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
Sales Turnover(Rs Million)	14	641.4	2,913,841	452,215	894,826
Profit after Tax(Rs Million)	14	-36.9	102,193	11,504.8	27,186
PBDITA	14	20.8	189,065	23,488	50,845
PAT/Avg.Capital Employed	14	-8.52	88.42	14.038	22.619
Capital Employed(Rs Million)	14	149.1	951,010	125,657	268,589
Debt-Equity Ratio	14	0	5.12	1.1064	1.324
TRNCAPE	<b>14</b>	<b>1.4554</b>	<b>7.8226</b>	<b>3.9068</b>	<b>1.8862</b>
Valid N	14				

*This table shows descriptive statistics for the sample.*

*Step IV:* Now, the regression has been performed TRNCAPE on F1, F2 and F3 for each category and the mathematical model has developed separately for three cases based on the following generalized methodology.

#### Development of the Model

Regression analysis were performed to analyze the associative relationship between a dependent variable (TRNCAPE) and three Factor Scores that represent the redesign variables RUR, RDR and RIR. The summarized results are given in Table 4.

#### Mathematical Model of Group I

$$TRNCAPE = \beta_0 + \beta_3F_3 \quad (2)$$

From the output, the above equation can be written as:

$$TRNCAPE = 1.230 + 0.453F_3 \quad (3)$$

$$TRANCAPE = 1.230 + 0.453F_3$$



$$\begin{aligned}
 TRNCAPE &= 1.230 + 0.453(1.660xRDR + 2.20xRIR) \\
 TRNCAPE &= -1.22 + 0.75xRUR - 0.639xRDR + 2.20xRIR
 \end{aligned}
 \tag{4}$$

Table 4: Summarized Results of Coefficients of Factor Score

	Case I [Group I]	Case II [Group II]	Case III [Group III]
Constant	1.230	2.170	3.907
Regression Factor Score 1[F <sub>1</sub> ]	-0.153 (0.092)	-0.513*** (0.118)	-1.286*** (0.303)
Regression Factor Score 2[F <sub>2</sub> ]	0.175 (0.092)	0.471*** (0.118)	0.595* (0.303)
Regression Factor Score 3[F <sub>3</sub> ]	0.453 *** (0.092)	-0.040 (0.118)	0.795** (0.303)
R Square Value	0.837	0.762	0.742

The table shows regression results based on equation (1). The figures in the brackets indicate the standard error. \*, \*\*, \*\*\* indicate significance at the 10, 5, and 1 percent levels respectively. In this study 5 and 1 percent level significance are only considered.

### Mathematical Model of Group II

$$TRNCAPE = \beta_0 + \beta_1 F_1 + \beta_2 F_2 \tag{5}$$

From the output, equation IV can be written as:

$$TRNCAPE = 2.170 - 0.513F_1 + 0.471F_2 \tag{6}$$

$$\begin{aligned}
 TRNCAPE &= \\
 &2.170 - 0.513x[3.420xRUR - 0.029xRDR + 1.393xRIR - 5.289] + 0.471x[-0.42xRUR + \\
 &2.462xRDR - 1.369xRIR - 1.231] \\
 TRNCAPE &= 4.303 - 1.769xRUR + 1.174xRDR - 1.359xRIR
 \end{aligned}
 \tag{7}$$

### Mathematical Model of Group III

$$TRNCAPE = \beta_0 + \beta_1 F_1 + \beta_3 F_3 \tag{8}$$

From the output, the equation can be written as:

$$TRNCAPE = 3.907 - 1.286F_1 + 0.795F_3 \tag{9}$$

$$\begin{aligned}
 TRNCAPE &= \\
 &3.907 - 1.286x[1.754xRUR - 0.310xRDR + 1.110xRIR - 4.154] + 0.795x[0.436xRUR - \\
 &1.846xRDR - 6.150xRIR - 4.882] \\
 TRNCAPE &= 5.368 - 1.908xRUR - 2.251xRDR + 3.463xRIR
 \end{aligned}
 \tag{10}$$

The results of the regression model for three groups are summarized in Table 5. The discussion clearly indicates that all the redesign variables such as relative measures of uncertainty, relative measures of differentiation and integration have an impact on organizational performance and R-square value of these three cases are high. The relationship between organizational performance and design mechanisms has been established. The specific sector has confronted with significant pressures of liberalization and the organizations have to redesign their organization structure to be fit in the changed market environment. The differentiation mechanism proves to be important parameter to explain the performance of the organization. The integration mechanism also becomes the key parameter to influence the performance of the organization.

Table 5: Representation of Results of Regression Analysis

	Group I	Group II	Group III
No of Organization	10	15	14
No of Respondents	25	37	54
R Value	0.814	0.871	0.802
R-Square Value	0.663	0.759	0.643
Constant	-1.22	4.303	5.368
Coefficient of Uncertainty(RUR)	0.75	-1.769	-1.908
Coefficient of Differentiation (RDR)	-0.639	1.174	-2.251
Coefficient of Integration (RIR)	2.20	-1.359	3.463

*This table summarizes the results of regression analysis. High R-square values indicate the strong relationships between the design parameters and organizational performance for three groups. The positive value coefficient of design parameters indicates the direct relationship with organizational performance and the negative value indicate the reverse relationship with organizational performance.*

The organizations are subjectively segmented into three groups and the redesign mechanisms such as RUR, RDR & RIR have an impact on organizational performance. The regression equations have coefficients to indicate the extent of correlation between the dependent variables with independent variables. The coefficient values of design parameters are indicative of the impact of design mechanisms on the performance of the organizations of the respective sector. The regression analysis results indicate the degrees of importance of design mechanisms on the performance of organizations of each of the three sectors are quite different.

It is interesting that organizations of the sectors face the business environment quite differently. Their restructuring mechanisms vary from one sector to another. So, those three groups have to formulate the three redesign strategies in different ways for superior performance. The detailed discussion has been made in the next section to explain the importance of the design mechanisms on the organizations of the three individual groups separately.

### Discussions

Based on the analysis, the following general observations are made for the organizations of Group I. The performance of the organizations is positively correlated with uncertainty reduction mechanisms. Their uncertainty reduction mechanisms such as high level of expenditure on research and development, use of sophisticated tools for market analysis and forecasting, periodic performance review meeting, information sharing in between every departments etc are high. As a result, in the turbulent market situation they perform better than the nearest competitors. They understand the market situation better and also feel the possible changes in the market environment. So they can formulate the product as well as market strategy prior to their competitors. That is also validated by the fact as Pepsico India Holdings Private Ltd., United Breweries, United Spirits, Indian Farmers Fertilizer Co-operative Limited(IFFCO) etc belong to the series. It is evidenced from the perceptual study of the organization. Pepsico India, United breweries and IFFCO has marked the highest perceptual value to indicate strong agreement with the above observations. These organizations are well structured and have strong marketing networks to understand the dynamics of the market. Based on the market research survey, they have well established R & D units to formulate new products that helps them retain and increase market share or to get entry into new potential markets.

Performance of the organizations is negatively correlated with the level of differentiation. The organizations are so diverse in operations that may challenge the alignment of the group objective in the same direction. The Strategic Business Units (SBUs) are not managed in equal efficiency or new lines of business may not achieve success due to improper planning or the acquisition they have made for diversification may not be a great success. It is clear that the organizations belong to the group must try to reduce the level of differentiation or divisionalization to improve performance.

Performance of the organizations is positively linked with the level of integration. The integrative mechanism is required to integrate all individual entity councils of strategy, brand, HRM, IT and finance.

The value culture has been impregnated among all the employees of all operational levels. This is evidenced from the perceptual study of the organizations like Pepsico, IFFCO, United Breweries. All of which strongly agreed with the strong value culture practices. All the departmental heads should participate in the forum at which issues could be analyzed and a consensus developed. It is also evidenced from the perceptual study question of the organizations like IFFCO, Andrew Yule, and Pepsico. The results are quite consistent with perceptual measures of the respondents of the concerned organizations. With increasing level of integration, the organizations will improve performance.

The organizations of the Group II are highly exposed to the uncertain environments which are mostly non-controllable. Most fertilizers organizations belong to this group and their business are mostly dependent on the climatic conditions of the regions which are completely non-controllable factors. The respondents expressed their concerns over this issue during the time of interview. For this reason, they are completely uncertain in their business. Some of organizations belong to confectionary industries. These industries are characterized with hyper-competitive environment, entry of foreign firms with high quality and brand value, changing perceptions of the consumers, strong presence of unorganized firms, price competitiveness etc. All give maximum level of emphasis on the sharing of information between departments to minimize the threats imposed by the hyper-competitive environment. That is evidenced from the data set of the perceptual study of uncertainty reduction mechanism of ITC, Kraft foods, Godrej Hershey Limited etc. They have also established strong relationships with supply chain members to increase competitiveness as evidenced from their response in the perception question. All of these indicate the turbulent environment the organizations face in the market. And, that uncertainty ultimately affects organizational performance.

From our conceptual framework it is obvious that organizations of these sectors have tried their best to extend their market, establishment of new verticals, formation of division with complete autonomy of the head, retraining and redeployment of the employees to increase the competencies etc. This is evidenced from the perceptual question of this section and most of these organizations such as Bayer Crop Science, Kraft foods, ITC Limited place maximum value on the highest level of autonomy of the department. The high perceptual value of the respondents for the enhancement of the expertise of employees indicates the generation of the skilled workforce for the success of each operation unit. All these strategies are leading to extensive levels of differentiation in all aspects. Results indicate that the increasing level of differentiation will lead to positive impact on performance.

Results show that the strong integration mechanisms affect the performance of organizations negatively. That means the organizations are centrally controlled and minimum level of delegation of authority hasten the prompt decision making process and also have a negative impact on the motivation of the employee. Centralized decision making process may also ignore the specific regional demand of the market and this is supported by the perception study of the respondents. Organizations like ITC, Dabur take decisions at the top level. If integration mechanisms involve formation of cross-functional teams, constant internal and external communication, the formation of task force to resolve common business issues etc., then only these redesign mechanisms have given positive input towards organization performance.

In Group III uncertainty reduction mechanisms are negatively correlated with the performance of the organizations. Some of the firms are from the petro-chemical sector. Before liberalization, the sector is completely dominated by state-owned enterprises (SOEs)-Bharat Petroleum Corporation Limited (BPCL), Hindustan Petroleum Corporation Limited (HPCL) and Indian Oil Limited. The three SOEs enjoyed a monopoly under the administered pricing mechanism of the government. With full deregulation of the industry in 2002, the market structure are completely changed and the entry of local (private) and global players make the industry highly competitive. The need is to redesign itself and shifting the mindset to perform in regulated markets to a lean, agile, competitive and customer-oriented player in order to compete. The other state owned organizations belong to the group, though they are present in

different sectors have shown the same trend and may be due to the same reasons of the fixed mind set. As they are in the protective environment, they have not developed sophisticated tools to make decisions, have underdeveloped market information systems and lack retraining making them more uncertain in the dynamic market scenario. Employee suggestions from divisions, investment in market research, and use of sophisticated tools, customer centric focus and strong backward and forward integration can only help to reduce the uncertainty.

The redesign mechanism that is differentiation is negatively correlated with performance. The divisions/departments may be created ideally but the real challenge is to implement. The personnel who are engaged to look after the departments show incompetence to run it properly. The incompetence may be due to lack of professional knowledge and also insufficient retraining for skill development. This is supported from the perceptual study of the differentiation mechanisms in which level of autonomy are marked as comparatively high but moderate level of initiatives for enhancement of expertise are indicated. Planned and selective division formation can create a positive impact on the performance.

Integration related practice enhances the performance of the organization. The primary job is to integrate corporate and SBU decisions, cohesion within and in between SBUs and establishment a strong network in between the verticals of the business such as Marketing, HR, Finance and Operations. Those integration mechanisms should be IT-enabled by that way they can understand and also respond quickly to the customers' needs and expectations. Integration mechanisms have been adopted by this group of organizations offering more possibilities for improving organizational performance.

## **CONCLUDING COMMENTS**

Results and consequent discussion indicates that the heterogeneity nature of the context in which organizations operate limits research to establish the relationship between organization-performance in a single functional form. The mentioned sector has been classified into three groups based on their distinctive nature of financial performance. The functional relationship between design parameters and organizational performance in case of individual segments of the mentioned sector has been established separately and the nature of the relationship has been also ascertained.

Perception of the respondents regarding design parameters (RUR, RDR and RIR) and performance parameter sales/ avg. capital employed (TRNCAPE) are used as the basis of the design-performance study. Regression analysis has been developed for the three mathematical functions for the three groups.

The above discussion clearly indicates that three groups behave uniquely with the business environment and their internal strategies are also quite different from each other. The model shown in Figure 2 is developed to visualize the nature of influence of design parameters on the organization performance in the three sectors.

FDR model specifies three groups as Flexible, Dynamic and Rigid, depending upon their nature of interaction with the business environment and their internal strategy. Flexible group organizations can adapt to uncertainties of the market using their highest level of differentiation. They can sustain their performance by increasing their level of integration. Dynamic group firms face an unfavourable market full of threats which they combat by differentiating themselves and by reducing their level of integration. Rigid firms facing threats cannot escape the shackles of red-tape and differentiate themselves. They are trying to emphasize integration in order to survive. The research study was restricted to a specific sector in India. An exploratory study considering all sectors of industry can also be made in the same context.

Figure 2: Flexible, Dynamic and Rigid Model

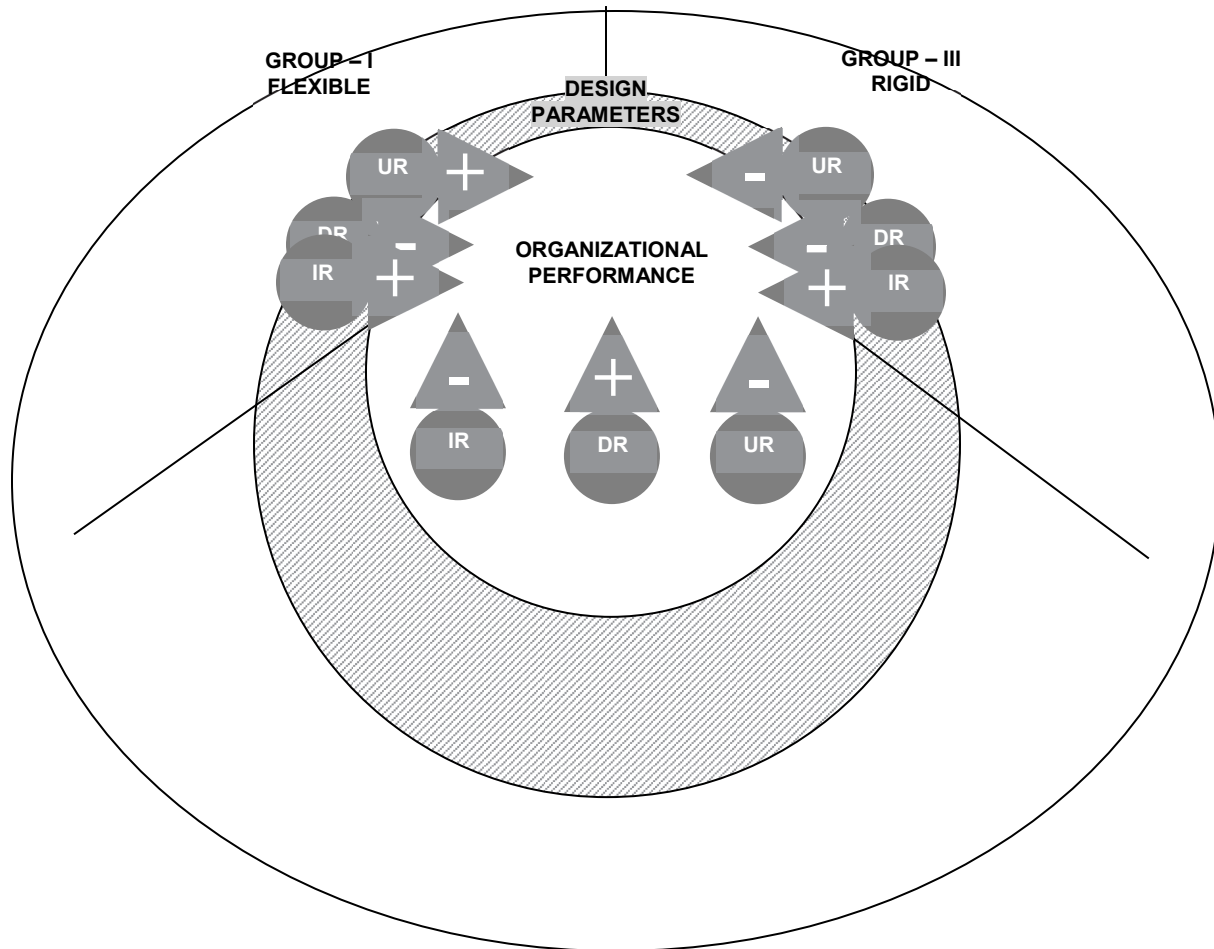


Figure 2: FDR Model showing the influence of design parameters on the organizational performance .UR, DR & IR indicates the design parameters Uncertainty Reduction, Differentiation and Integration respectively. '+' sign indicate the positive relationship in between design parameters and organizational performance and '-' sign indicate that the design parameter has adverse effect on the organizational performance.

The primary objective of this was to explore a fundamental question about organization redesign of the Chemical; Petro-chemical Process Industry; Agricultural related Industry; Processed Food Industry and Bio-Chemical related Industry in the context of India. Within this context, this study examined the relationship between redesign mechanisms of a specific sector after the decade of restructuring the most populous emerging markets. A model, rooted in conventional Western practices, found support and is largely consistent with results obtained in studies of design–firm performance conducted in different socio-cultural environments. This study is specific to certain sectors and established the relationship between design–firm performances in the India context which had just emerged from two decades of macroeconomic liberalization policies and modernization of its economy. The results are quite consistent. The objective of future study will develop the model for three groups which indicate the optimal level performance based on three redesign mechanisms.

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## BIOGRAPHY

Arabinda Bhattacharya has been teaching in the Department of Business Management as an Associate Professor for the last 36 years. He has completed his M.Stat from the Indian Statistical Institute in 1974. He obtained M.Phil. in Economics from the Centre for Development Studies, Trivandrum affiliated to Jawaharlal Nehru University, New Delhi. He has also done FDP in Management from Indian Institute of Management, Ahmedabad. His research interest is in the area of Organization Behavior, Market Research. He can be contacted at: ara\_bha@yahoo.co.in

Amit Kundu has been associated with the School of Management Studies, Techno India as an Assistant Professor, since June, 2006. He has also been associated with the corporate world. Previously he was Business Development Executive of Consulting Engineering Services (India) Private Limited. He is associated with them as a Consultant in the areas of marketing strategy, market research study, feasibility analysis, project planning and implementation. He has completed his B.Tech in Food Technology and Bio-chemical engineering from Jadavpur University, Kolkata and obtained his MBA from Bengal Engineering and Science University. His research interest is in the area of Organization Design and Performance, Quality standards in Food and allied industries. He can be contacted at: School of Management Studies, Techno India. EM-4/1, Sector –V, Salt Lake, Kolkata, West Bengal, India. PIN-700 091. Phone: + (91) (033) (2357-5683) Email: amit.kundu74@gmail.com

