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Contents

Perceptions of Country of Origin: An Empirical Evidence

Kang Canhua and Samantha Kumara***

The main purpose of this study is to examine how consumers in developed and developing countries perceive products made in these countries, in general. The samples of the study consists of 65 foreign undergraduates in China. The data for the study are gathered through the administration of a formal questionnaire. Mann-Whitney U test is used to examine the differences of the perceptions of General Product Attributes (GPAs) of products made in developed and developing countries between the undergraduates of developed and developing countries. The results of the study reveal that there is no significant difference of the perceptions of GPAs of products made in developed and developing countries between the undergraduates of developed and developing countries.

INTRODUCTION

Country of Origin (COO) is one of the cues consumers use as an evaluative judgment in their buying decisions. Since the mid-1960s, a considerable number of studies have been conducted on country image (Han, 1990). Many studies have also focused on studying the nature of the perceptions of consumers in different countries on products made in different countries (Bannister and Saunders, 1978; Baumgartner and Jolibert, 1978; Gaedeke, 1973; Morello, 1984; and Nagashima, 1970 and 1977). Consumers in different contexts (i.e., countries) have different set of perceptions of products made in various contexts (i.e., developed and developing countries). Consumers tend to evaluate products more favorably when these originate from or are made in countries that enjoy a positive image or perceptions (Liu and Johnson, 2005). The understanding of the image of a particular country, whether it enjoys a positive or negative image is very significant to marketers and policymakers, since the potential decision-making can be positioned on it. Macro level COO image view is a wider perspective since it comes across the economic, political, technological and socio-cultural environments of the origin country. At the macro level, mention of a particular country conveys a general image (Hooley *et al.*, 1988). Consumers rate specific attributes of a country's products in accordance with their overall perception of the origin country.

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In addition, when consumers are not familiar with a particular country's product, the general perception of the origin country serves as an information cue to evaluate products.

This study attempts to explore how consumers in developed and developing countries perceive products' country of origin. Accordingly, some of previous studies are reviewed, at the beginning so as to provide an insight on the present study area and show the position of the present study. There, the hypothesis of the study and significance of this study are explained respectively. Second, the sample and data collection procedure is described. Third, the results of the study are discussed and finally conclusions are made based on the analysis and discussion.

REVIEW OF LITERATURE AND JUSTIFICATION OF THE STUDY

COO image refers to consumers' relative perceptions of qualities of products produced in various countries. The COO concept has gradually evolved from the idea that people attach stereotypical "made in" perceptions to products from specific countries (Parameswaran and Pisharodi, 1994). Consumers utilize country image to infer the quality of foreign brand because they are unable to detect its true quality prior to purchase use (Shapiro, 1982). Country image is consumers' general perceptions of quality for products made in a given country (Bilkey and Nes, 1982). Johansson *et al.* (1985) define COO as "the country where corporate headquarters of the company marketing the product or brand is located". The 'made in' sign communicates the image, i.e., reputation, stereotype, etc., attached to the country which the product comes from (Samantha, 2004). COO is an intrinsic product cue, a class of intangible product traits, which include a product's brand, price and warranty (Cordell, 1992). The image is shaped by mass communication, personal experience and views of national opinion leaders (Nagashima, 1970). Gardner and Levy (1955) note that an augmented product not only has a physical nature, but also a social and psychological one, and hence, the sets of feelings, ideas, and attitudes that consumers have about products (their image) are crucial to purchase choice. Consumers hold stereotyped images about countries and these images are used as information cues in judging products from different origins (Lots and Hu, 2001). In addition, country image may be an asset when it is positive and a liability when it is negative, and country image may be shared by one or several types of product, but not all product categories (Lampert and Jaffe, 1998). Further they highlight that a given country's product may have varying images across countries. It has been found that all products originating in foreign countries are subject to COO [image] effects (Han and Terpstra, 1988). In general, COO studies agreed that consumers have significantly different global and general perceptions about products made in different countries (Han, 1990). COO image affects more frequently to perceptions about the overall product offerings of a particular origin country. Consumers use country of origin data as stereotypical information in making evaluations about a product (Maheswaran, 1994).

Consumers may infer the quality of a product category from a given country from their perceived quality of other categories or products in general from the country (Han, 1990). Alternatively, even if consumers are familiar with products and brands from a foreign country their images are influenced by their higher level of perception and attitudes of national products in general (Ofir and Lehmann, 1986). In this study, we focused on perceptions of products made in developed and developing countries in general and did not focus on specific product or product category, since our attempt was on identifying consumers' general perceptions of products made in two different contexts, i.e., developed and developing countries. Hypothesis of this study is based on the fact that the consumers of developed and developing countries perceive products made in developed and developing countries differently. Alternatively, if this notion is not acceptable, the perception of COO of particular product depends on the product or product category. For example, consumers may enjoy a positive image of a particular product, though it comes from a particular developing country based on the product attributes. Accordingly, following hypothesis is derived so as to examine how consumers in developed and developing countries perceive products' origin i.e., from developing and developed countries.

***Hypothesis**: Perceptions of products made in developed and developing countries are significantly different between the consumers in developed and developing countries.*

This study is significant in the sense of providing insights into strategic marketing decisions and the policy decision-making. The findings of country image studies should enable managers to use 'country image' more frequently and effectively as a competitive tool in international marketing (Parameswaran and Pisharodi, 1994). Given the growing range of products available in the market place, marketers can use COO cue in order to add value to their products and differentiate them by specific positioning, e.g., useful COO information can be provided by advertising, packaging and branding, etc. (Baker and Ballington, 2002). In formulating appropriate marketing programs for imported products from developing countries, management must be sensitive to consumer attitudes towards such products (Gaedeke, 1973). In addition, COO influences policy decisions in the area of economic, political and socio-cultural aspects. Hence, policymakers must be aware of the relationship of the country image and their policy decisions, since country image benefits the country as a whole.

SAMPLE AND DATA COLLECTION

The total sample of the study consists of 65 foreign undergraduates i.e., 15 from Wuhan University of Technology, 30 from Wuhan University and 20 from Central China Normal University in China. In addition, the representative nature of respondents in terms of developed and developing countries[1], was ensured having 32 from developed country category and 33 from developing country category. In terms of gender, the sample consisted of 29 males (developed = 15,

[1] Developed country consumer category included consumers from Germany, The Netherlands, France, South Korea and Japan. Developing country consumer category included consumers from India, Sri Lanka, China, Bangladesh, Palestine, Yemen, Sudan, Vietnam, Togo and Federated States of Micronesia.

and developing = 14) and 36 females (developed = 17 and developing = 19).

Undergraduates were selected since they represent the potential decision-makers, and hence, their perceptions of COO image present impending implications to buying behavioral trends. The sample was chosen based on the convenience to reach sample respondents. The questionnaire of the study was designed using 13 attributes related to General Product Attributes (GPAs) (Table 1), reviewing Parameswaran and Pisharodi's (1994) GPAs. Questionnaire was developed in English and was not translated into respondents' native languages, since all the foreign students were fluent in English. A seven point semantic differential scale was used to categorize consumers' perceptions of each attribute. The missing values were given 'neutral' (4) in each case since the limited sample size and very few numbers of cases (4) were missed.

Table 1: Scale Items of GPAs

General Product Attributes	Label
Artistic and Creative Products	P_1
Appearance of Products	P_2
Standardization of Products	P_3
Expensiveness	P_4
Range of Products	P_5
Long Lasting Products	P_6
Advertising Informative	P_7
Repair Requirement	P_8
Technology Used	P_9
Product Value	P_{10}
Availability	P_{11}
Prestigious Products	P_{12}
Inventive	P_{13}

ANALYSIS AND RESULTS

The perception of foreign products was measured using 13 attributes. Since these 13 measures focused on single construct, i.e., perception of country of origin, it was required to ensure the reliability of the attributes measures used in the study. The reliability is ensured through Cronbach's Alpha value (α). Table 2 shows α value for each attribute measures and accordingly the values are around 0.76, indicating higher reliability on the measurement of perception of country of origin. In addition the overall α is 0.781 and α based on standardized is 0.808 (Table 3).

The analysis was done with the purpose of identifying the differences of the

Table 2: Item Reliability Statistics

General Product Attributes	Cronbach's Alpha if Item Deleted
Artistic and Creative Products	0.774
Appearance of Products	0.793
Standardization of Products	0.757
Expensiveness	0.787
Range of Products	0.775
Long Lasting Products	0.752
Advertising Informative	0.761
Repair Requirement	0.768
Technology Used	0.768
Product Value	0.748
Availability	0.767
Prestigious Products	0.760
Inventive	0.756

Table 3: Overall Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	Number of Items
0.781	0.808	13

perceptions of GPAs of developed and developing country products between the consumers in developed and developing countries. Accordingly, Mann-Whitney U test was used with Wilcoxon Mean Ranks to examine differences of the perceptions of GPAs of products made in developed and developing countries (at 5% confident level). The developed country consumer category was considered as Group 1, while developing country consumer category as Group 2.

Table 4 shows that Mann-Whitney U test mean ranks for the perceptions of GPAs of products made in developed countries. There, it revealed that the scores for the perceptions of P_1 (17.90), P_2 (17.53), P_3 (17.50), P_6 (16.90), P_8 (16.97),

Table 4: Mann-Whitney U test Mean Ranks
Perceptions of GPAs of Products Made in Developed Countries

Attribute	Label	Consumer Country Category	Mean Rank	Sum of Ranks
Artistic and Creative Products	P_1	Developed	14.22	227.50
		Developing	17.90	268.50
Appearance of Products	P_2	Developed	14.56	233.00
		Developing	17.53	263.00
Standardization of Products	P_3	Developed	14.59	233.50
		Developing	17.50	262.50
Expensiveness	P_4	Developed	17.09	273.50
		Developing	14.83	222.50
Range of Products	P_5	Developed	17.72	283.50
		Developing	14.17	212.50
Long Lasting Products	P_6	Developed	15.16	242.50
		Developing	16.90	253.50
Advertising Informative	P_7	Developed	17.38	278.00
		Developing	14.53	218.00
Repair Requirement	P_8	Developed	15.09	241.50
		Developing	16.97	254.50
Technology Used	P_9	Developed	14.84	237.50
		Developing	17.23	258.50
Product Value	P_{10}	Developed	16.19	259.00
		Developing	15.80	237.00
Availability	P_{11}	Developed	14.66	234.50
		Developing	17.43	261.50
Prestigious Products	P_{12}	Developed	15.16	242.50
		Developing	16.90	253.50
Inventive	P_{13}	Developed	16.38	262.00
		Developing	15.60	234.00

P_9 (17.23), P_{11} (17.43) and P_{12} (16.90) for developing country category consumers are higher than the developed country category consumers. Scores of the developed country category consumer perceptions for P_4 (17.09), P_5 (17.72), P_7 (17.38), P_{10} (16.90) and P_{13} (16.38) are higher than the scores of the developing country category consumers. The Mann-Whitney U test statistics in Table 5 shows the relevance U values for each GPA. As per Table 5, it can be noted that those U values are not high. Moreover, all the corresponding probability values are higher than 0.05 ($p > 0.05$), revealing that no significant difference exists in the perceptions of GPAs of products made in developed countries between developed and developing country consumers.

Table 6 shows Mann-Whitney U test mean ranks for the perceptions of GPAs of products made in developing countries. Accordingly, consumers in developing country category have higher mean scores for all the other GPAs, except for P_1 (17.73) and P_4 (17.67) than for the consumers in the developed country category.

Corresponding Mann-Whitney U test statistics are given in Table 7. The U values given in Table 6 are also not high values. In addition, all the probability values are higher than 0.05 ($p > 0.05$) except for 'repair requirements' ($p < 0.031$). Based on that, it can be concluded that though mean rank scores differ between the two groups of consumers, there is no significant difference of the perceptions of GPAs (except 'repair requirements') of products made in developing countries between consumers of developed and developing countries. For 'repair requirements', the perception is significantly different i.e., perception of 'repair requirements' of products made in developing countries is

Table 5: The Mann-Whitney Test Statistics[a] Perceptions of GPAs of Products Made in Developed Countries by Developed and Developing Country Consumers

	Mann-Whitney *U*	*Asym_Sig.* (Two-Tailed)
Artistic and Creative Products	91.5	0.239
Appearance of Products	97.0	0.349
Standardization of Products	97.0	0.353
Expensiveness	102.5	0.479
Range of Products	92.5	0.259
Long Lasting Products	106.5	0.562
Advertising Informative	98.0	0.369
Repair Requirement	105.5	0.551
Technology Used	101.5	0.418
Product Value	117.0	0.901
Availability	98.5	0.380
Prestigious Products	106.5	0.575
Inventive	114.0	0.803

[a] Grouping variable: Consumer Country Category—developed country = 1 and developing country = 2.

Table 6: Mann-Whitney U test Mean Ranks
Perceptions of GPAs of Products Made in Developing Countries

Attribute	Label	Consumer Country Category	Mean Rank	Sum of Ranks
Artistic and Creative Products	P_1	Developed	17.73	266.00
		Developing	15.41	262.00
Appearance of Products	P_2	Developed	16.37	245.50
		Developing	16.62	282.50
Standardization of Products	P_3	Developed	14.43	216.50
		Developing	18.32	311.50
Expensiveness	P_4	Developed	17.67	265.00
		Developing	15.47	263.00
Range of Products	P_5	Developed	15.33	230.00
		Developing	17.53	298.00
Long Lasting Products	P_6	Developed	13.20	198.00
		Developing	19.41	330.00
Advertising Informative	P_7	Developed	15.90	238.50
		Developing	17.03	289.50
Repair Requirement	P_8	Developed	12.80	192.00
		Developing	19.76	336.00
Technology Used	P_9	Developed	13.80	207.00
		Developing	18.88	321.00
Product Value	P_{10}	Developed	15.87	238.00
		Developing	17.06	290.00
Availability	P_{11}	Developed	14.97	224.50
		Developing	17.85	303.50
Prestigious Products	P_{12}	Developed	16.47	247.00
		Developing	16.53	281.00
Inventive	P_{13}	Developed	14.77	221.50
		Developing	18.03	306.50

significantly different between the consumers in developed and developing countries.

CONCLUSION

The results of the analysis conclude that there is no significant difference in the perceptions of GPAs of products made in developed and developing countries between the consumers in developed and developing countries. Hence, the hypothesis of the study is not supported by the results of the study, i.e., consumers

Table 7: The Mann-Whitney Test Statistics[b] Perceptions of GPAs of Products Made in Developing Countries by Developed and Developing Country Consumers

	Mann-Whitney *U*	*Asym_Sig.* (Two-Tailed)
Artistic and Creative Products	109.0	0.465
Appearance of Products	125.0	0.937
Standardization of Products	96.5	0.223
Expensiveness	110.0	0.501
Range of Products	110.0	0.494
Long Lasting Products	78.0	0.053
Advertising Informative	118.5	0.727
Repair Requirement	72.0	0.031
Technology Used	87.0	0.116
Product Value	118.0	0.710
Availability	104.5	0.369
Prestigious Products	127.0	0.984
Inventive	101.5	0.315

[b] Grouping variable: Consumer Country Category - developed country = 1 and developing country = 2.

of developed and developing countries perceive products made in developed and developing countries almost similarly. Most of the studies (Kaynak *et al.*, 2000; Kaynak and Kara, 2002; and Lantz and Loeb, 1996, etc.) conclude that consumers have positive country image perceptions towards products made in developed countries, while products made in developing countries have negative country image perceptions. But, Liefeld's (2004) study reveals that majority of the consumers have not considered the COO of the products they have purchased, and accordingly concluded that COO did not play a role in the choice of products. The findings of this study also show that perceptions of products made in developed and developing countries are not significantly different between the consumers in developed and developing countries, showing that country image does not play a significant role in product evaluations. Subsequently, the findings of the study provide implications for marketers in terms of promoting products in international markets. For example, product differentiation cannot be done merely based on highlighting the 'made in' term. Marketers must be careful of mere utilization of the term 'made in' to promote their products. Study showed that consumers do not consider the product's origination in their product evaluations. In developing international affairs and making decisions on economic, socio-cultural and technological infrastructure settings, the findings of the study are useful for policy decision-makers. COO is only one of the extrinsic quality cues consumers use to evaluate products.

From theoretical perspective, though major concerns in many of the studies in this study area are given on examination of the effects of country image on product evaluations (e.g., Bannister and Saunders, 1978; Johansson *et al.*, 1985; Kaynak and Kara, 2002; Kaynak *et al.*, 2000; Lantz and Loeb, 1996; Liu and Johnson, 2005; Morello, 1984; and Nagashima, 1970 and 1977, etc.), there is a gap in exploring the causatives behind different perceptions of foreign products. Subsequently, it will be worthy to examine the contributory causes behind perceptions of COO of foreign products, in addition to the studies on the effects of COO of products on product evaluation. Thus, the contradictory nature of the results of different studies can be eliminated or minimized by having an approach to enhance the understanding of the causatives behind consumer perceptions of foreign products.

But the generalization of the study findings is cautious, since country bias may have influence on positive/negative perceptions for particular product/product category. Generalization of the results may also be influenced by the sample composition and size.

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Changes in Usage Price of Cellular Phone Services and its Welfare Implications for the Subscribers: An Evidence from India[†]

*Ashish Dash**

This paper estimates price elasticities of the usage demand for cellular phone services in India for the pre-paid and post-paid subscribers. Using the estimated elasticities, welfare implications for the pre-paid and post-paid cellular mobile service subscribers in terms of changes in the consumer surplus are obtained and compared by the four categories of mobile telecom circles. This result implies that the distributive implication of price changes is positive for the cellular service subscribers in India.

INTRODUCTION

Competition in the telecom sector, coupled with the provision of interconnection has widened consumers' choice. These changes have also posed a challenge to evaluate the demand relations in the case of new products and services such as mobile and wireless telephony. However, most of the studies on demand for telecommunication relate to the developed countries. This is evident in the comprehensive survey of demand for telecommunication by Taylor (1994). In fact, Taylor (2003) has summarized the present state of the art in telecommunications demand modeling. His review finds that the use of quantal choice models, the analysis of toll demand on a point to point basis, and the application of random coefficient methods to a system of toll demand equations were in common practice in the 1980s and the1990s. Studies on the demand for telecommunication in India are few which include Muralikannan (1996) and Das and Srinivasan (1999) where the price elasticities of telecom services for the land line services have been computed. Even in the international context, there are a few empirical studies on demand for telecommunication which include Park *et al.* (1983) estimation of price elasticities for the local telephone calls in the context of USA and, the study by Lang and Lundgren (1991) for the Swedish data. This paper aims at (a) explaining the characteristics and the

† This paper was presented at the Consortium of Students in Management Research (COSMAR) held in the Department of Management Studies, Indian Institute of Science, Bangalore during September 21-23, 2006.

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pattern of usage demand for pre-paid and post-paid mobile services in India by estimating the price elasticity of usage demand (b) computation of welfare gain of price changes for the subscribers through changes in consumer surplus.

EMPIRICAL FRAMEWORK

The study uses quarterly data since March 2003 for five quarters by the four categories of circles (see Appendix 1). Since different categories of circles may have fixed characteristics, panel regressions have a greater flexibility in modeling differences in fixed effects across the individual category of circles.

The diversified nature of telecom services that are jointly produced and priced, pose a special problem in arriving at a single quantity or price variable. A cellular subscriber consumes both voice (incoming and outgoing calls) and non-voice services such as Short Message Service (SMS), roaming and other value added services, which are measured in different units. To start with, the quantity demanded is expressed as a function of its own price:

$$Q^s = f(P^s) \qquad \ldots(1)$$

where, Q^s is the quantity demanded of s^{th} service and;

P^s is the price of the corresponding service.

The price of Q^s varies from provider to provider, plan to plan of the same provider, distance to which the call is made and the time of call, to mention a few dimensions of variation. Hence, arriving at a unique price variable also requires some forms of aggregation. The study uses the following combinations of demand and price variables:

1. Minutes of Usage (MOU) per subscriber per month is used as a measure of the demand variable and Revenue Realized Per Minute of Usage (RRPMOU) as the corresponding measure for the price variable. Here, MOU includes both the incoming and outgoing minutes and RRPMOU is the price paid per minute by the subscribers.
2 The Outgoing Minutes of Usages (OGMOU) and Call Revenue Per Minute of Outgoing Usage (CRPMOOGU), are another set of demand and price variables, respectively. OGMOU here is a measure of the usage demand whereas CRPMOU is a measure of the usage price.

The basic framework for a regression model using panel data can be specified as:

$$Q_{ct}^{s} = \alpha_c + \beta(p_{ct}^{S}) + u_{it} \qquad \ldots(2)$$

In the case of Pooled Regression Model (PRM): $\alpha_c = \alpha, \forall_c$

For Fixed Effect Model (FEM): $\alpha_c \neq \alpha_J \forall_{cj}$ where;

α_i are unknown and vary across a cross section unit and, For Random Effect Model (REM): $\alpha_c = \alpha + \varepsilon_i$, where ε is the random error term.

A linear functional form is used in order to obtain the estimated quantity demand for the mobile services. Using these estimated minutes of usage and the observed price, the price elasticities are obtained. The linear functional form allows the price elasticity to vary with the observed prices as the price elasticities are computed by multiplying the price coefficient with the ratio of the observed price and corresponding estimated quantity demanded. Symbolically:

$$e_{ct}^{s} = \hat{\beta} \times \frac{p_{ct}^{s}}{EQ_{ct}^{s}} \qquad \ldots(3)$$

where, e_{ct}^{s} = price elasticity of usage demand in c[th] circle for t[th] time period.

$\hat{\beta}$ is the estimated slope coefficient obtained from equation (2)

p_{ct}^{s} is the usage price for s[th] service in c[th] circle and t[th] time period.

EQ_{ct}^{s} is the estimated quantity demand for s[th] service in c[th] circle and t[th] time period.

The expected sign for the price coefficient is negative. The elasticities thus obtained are useful in estimating how the subscribers would have benefited through changes in the consumer surplus across all the circles. This can be computed in line with Das and Srinivasan (1999) [used in the context of the landline telephone to evaluate the change in consumer surplus] which is provided in the following expression:

$$\Delta CS_{ct}^{s} = -Q_{ct}^{s} \times dp_{ct}^{s} - \frac{1}{2} \times p_{ct}^{s} \times Q_{ct}^{s} \times \frac{dp_{ct}^{s}}{p_{ct}} \times \frac{dp_{ct}^{s}}{p_{ct}} \times e_{ct}^{s} \qquad \ldots(4)$$

where,

ΔCS_{ct}^{s} = Change in consumer surplus in c[th] circle in t[th] quarter.

q_{ct}^{s} = Quantity demanded as a result of fall in price in c[th] circle in t[th] quarter.

e_{ct}^{s} = Estimated elasticity of usage demand for mobile telecom service in c[th] circle in t[th] quarter.

dp_{ct}^{s} = Change in price in c[th] circle in t[th] quarter.

p_{ct}^{s} = Original price of usage demand for telecom services in c[th] circle in t[th] quarter.

DATABASE

In order to obtain a uniform price and quantity variable, several approximations have been used. Table 1 gives the details of the data source, characteristic and its limitations.

The data on revenue realized per minute of usage, outgoing minutes of usages and call revenue per minute of outgoing usage are generated using the basic information (as provided by TRAI for various quarters by telecom circles) on minutes of usage, revenue per subscriber, proportion of incoming minutes of usage in total traffic and percentage of revenue from call charges. Section 3.1 and 3.2 provide information on the above data and also describe the way the demand and price variables are generated.

DEMAND VARIABLES FOR PRE- PAID AND POST-PAID SUBSCRIBERS

As discussed earlier, the minutes of usage and the outgoing minutes of usage are used as demand variables. The minutes of usage measures both the incoming and outgoing minutes of usage for the

Table 1: Variables and Data Descriptions

Variables	Measurement	Data Sources	Limitations
Minutes of Usages (MOU) per subscriber per month	Minutes of Usages (MOU) per subscriber per month	Various Issues of Indian Telecom Service Performance indicators published by TRAI	Not available by telecom circles. Available for pre-paid and post-paid subscribers separately by circle category on quarterly basis.
Outgoing Minutes of Usages (OGMOU) per subscriber per month	Outgoing Minutes of Usages (OGMOU) per subscriber per month		
Revenue Realized Per Minute of Usage (RRPMOU)	Revenue Realized Per Minute of Usage (RRPMOU)		Available by category of circle. From the available information quarterly data can be obtained for the pre-paid and post-paid subscribers separately by circle category.
Price Per Minute of Outgoing Usage (RRPMOOGU)	1) Multiplying Revenue Per Subscriber (RPS) and Percentage of Revenue from Call Charges (PRCC) 2) Dividing it by OGMOU		
Revenue Per Subscriber (RPS)			Not available by circle. Quarterly information is available for pre-paid and post-paid subscribers separately by circle category.
Percentage of Revenue from Call Charges (PRCC)			
Proportion of incoming minutes of usage			

Source: Author.

subscribers. On the other hand, the outgoing minutes of usage is the proportion of the outgoing minutes in the total telephone traffic. Thus, these two variables explain two different kinds of usage demand for the telecom services. The basic data on the minutes of usage per subscriber per month for quarter ending March 2003 to March 2004 for pre-paid and post-paid subscribers are provided in Table 2. In addition, Table 2 also provides quarterly growth and average quarterly growth of the two different kinds of usage demand by the four categories of mobile telecom circles for the pre-paid and post-paid subscribers during the same period of time.

It could be seen from Table 2 that the average quarterly growth in minutes of usage is positive in all categories of circles for pre-paid and post-paid subscribers, except for post-paid subscribers in the A category of circles. The minutes of usage has registered a negative average growth

Table 2: Minutes of Usage per Subscriber Per Month for Pre-paid and Post-paid Subscribers

Circles Category	March 2003	June 2003	September 2003	December 2003	March 2004	Average Quarterly Growth
	Pre-paid Subscribers					
A	159	171 (7.55)	217 (26.90)	211 (-2.76)	233 (10.43)	10.53
B	142	142 (0.00)	173 (21.83)	216 (24.86)	293 (35.65)	20.58
C	83	101 (21.69)	127 (25.74)	268 (111.02)	234 (-12.69)	36.44
M	138	179 (29.71)	210 (17.32)	206 (-1.90)	202 (-1.94)	10.80
Post-paid Subscribers						
A	609	512 (-15.93)	653 (27.54)	589 (-9.80)	571 (-3.06)	-0.31
B	365	529 (44.93)	590 (11.53)	573 (-2.88)	529 (-7.68)	11.48
C	402	378 (-5.97)	398 (5.29)	284 (-28.64)	418 (47.18)	4.47
M	618	632 (2.27)	679 (7.44)	680 (0.15)	678 (-0.29)	2.39

Note: Figures in the parentheses are % growth over the previous quarter.

Source: Compiled from TRAI (2003[a], 2003[b], 2004[a], 2004[b]).

of –0.31% in the case of A category of circles. The pre-paid and post-paid subscribers in B category and C category of circles have registered a higher growth in comparison with A category and M category of circles for the studied period. While C category of circles has registered the highest quarterly average growth of 36.44% in minutes of usage in the pre-paidpaid service, the B category circles have registered the highest average quarterly growth of 11.48% in the case of post-paid category. The average quarterly growth in minutes of usage for Pre-paidpaid subscribers is 10.53, 20.58, 36.44 and 10.80%, for A, B, C and M category of circles, respectively. On the other hand, the average quarterly growth of minutes of usage in the case of post-paid subscribers is -0.31, 11.48, 4.47 and 2.39% for A, B, C and M category of circles, respectively.

In order to obtain the outgoing minutes of usage, the proportion of outgoing minutes of usage is computed. In fact, TRAI in its various issues of Indian Telecom Service Performance Indicators provides data on the proportion of the incoming minutes of usage.Using the information on the proportion of incoming minutes in the total traffic, the proportion of outgoing minutes of usage is calculated and presented in Table 3

Table 3 shows that the proportion of outgoing minutes of usage in the total traffic is greater in all the categories of circles for all the quarters in the case of post-paid subscribers than that of pre-paid subscribers. This shows that the mobile services are mainly used to receive incoming calls in the pre-paid service category. Even in the case of post-paid services, the outgoing minutes of usage is less than 50% in all the cases except for the post-paid subscribers in A category of circle for the quarter ending December 2003 where, the proportion of the outgoing minutes in total traffic is 53%.

Table 3: Proportion of Outgoing Minutes of Usages in Total Traffic

	March 2003		June 2003		September 2003		December 2003		March 2004	
Circles Category	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid
A	NA	NA	29	42	29	44	31	53	27	42
B	NA	NA	27	44	34	47	34	47	31	47
C	NA	NA	27	41	20	47	34	44	34	42
M	NA	NA	24	47	23	45	20	45	19	44
India	27	41	26	45	27	45	28	49	26	44

Note: NA denotes not available.

Source: Computed by using basic data on percentage of incoming minutes of usage, TRAI (2003[a], 2003[b], 2004[a], 2004[b]).

The Outgoing Minutes of Usage per subscriber per month is computed by using the data on the Minutes of Usage (in Table 2) and the percentage of outgoing minutes of usage (in Table 3). It is defined as the Product of Minutes of Usage Per Subscriber Per Month (MOUPSPM) and Proportion of Outgoing Minutes of Usage(POGMOU) in the total traffic. For the month ending March 2003, the information on the percentage of outgoing calls is available only at the national level of aggregation; the outgoing minutes of usage for the same period has been arrived at by multiplying the MOUPSPM with the percentage of outgoing minutes of usage at the national level. Table 4 gives the Outgoing Minutes of Usage (OGMOU) per subscriber per month for pre-paid and post-paid subscribers.

Table 4 shows that the outgoing minutes of usage have shown a positive average quarterly growth in all the categories of circles for the pre-paid and post-paid subscribers. The average quarterly growth in the outgoing minutes of usage is higher in B category and C category of circles in comparison with A category and M category of circles. In the case of Pre-paidpaid subscribers the average quarterly growth in the outgoing minutes of usage was 25.49 and 65.22% for B and C category of circles, respectively, whereas, it was 10.61 and 1.55% for A and M category of circles. Similarly, for the post-paid subscribers, the average quarterly growth in the outgoing minutes of usage was 16.12 and 5.51% for B category and C category of circles, respectively, whereas, it was 1.30 and 4.55% for A category and M category of circles respectively.

PRICE VARIABLES FOR PRE-PAID AND POST-PAID SUBSCRIBERS

The revenue for the providers of mobile telecom services comes from its different service components such as: rental revenue, call revenue, roaming revenue and SMS and miscellaneous revenue.

Revenue Per Subscriber

The data on Revenue Per Subscriber (RPS) are used for arriving at RRPMOU, and CRPMOOGU. The RPS for pre-paid and post-paid subscribers is given in Table 5.

Table 4: Outgoing Minutes of Usage for Subscribers

Circles Category	March 2003	June 2003	September 2003	December 2003	March 2004	Average Quarterly Growth
Pre-paid Subscribers						
A	42.93	49.95 (16.35)	62.93 (25.99)	65.41 (3.94)	62.91 (-3.82)	10.61
B	38.34	38.34 (0.00)	58.82 (53.42)	73.44 (24.86)	90.83 (23.68)	25.49
C	22.41	27.27 (21.69)	25.4 (-6.86)	91.12 (258.74)	79.56 (-12.69)	65.22
M	37.26	42.96 (15.30)	48.3 (12.43)	41.2 (-14.70)	38.38 (-6.84)	1.55
Post-paid Subscribers						
A	249.69	215.04 (-13.88)	287.32 (33.61)	312.17 (8.65)	239.82 (-23.18)	1.30
B	149.65	232.76 (55.54)	277.3 (19.14)	269.31 (-2.88)	248.63 (-7.68)	16.12
C	164.82	154.98 (-5.97)	187.06 (20.70)	124.96 (-33.20)	175.56 (40.49)	5.51
M	252.38	297.04 (17.70)	305.55 (2.86)	306 (0.15)	298.32 (-2.51)	4.55

Note: Figures in the parentheses are % growth over previous quarter.

Source: Author.

Table 5: Revenue Per Subscriber for Pre-paid and Post-paid Mobile Services

Circles Category	March 2003	June 2003	September 2003	December 2003	March 2004	Average Quarterly Growth
Revenue Per Subscriber for Pre-paid Services (Rs.)						
A	261	274 (4.98)	334 (21.90)	286 (-14.37)	279 (-2.45)	2.51
B	281	290 (3.20)	309 (6.55)	305 (-1.29)	285 (-6.56)	0.48
C	424	386 (-8.96)	355 (-8.03)	394 (10.99)	346 (-12.18)	-4.55
M	294	293 (-0.34)	297 (1.37)	264 (-11.11)	258 (-2.27)	-3.09
Revenue Per Subscriber for Post-paid Services (Rs.)						
A	1,056	1,051 (-0.47)	1,039 (-1.14)	917 (-11.74)	780 (-14.94)	-7.07
B	796	1,055 (32.54)	1,091 (3.41)	884 (-18.97)	783 (-11.43)	1.39
C	1,973	2,175 (10.24)	1,900 (-12.64)	965 (-49.21)	792 (-17.93)	-17.39
M	1,384	1,340 (-3.18)	1,346 (0.45)	1,348 (0.15)	1,323 (-1.85)	-1.11

Note: Figures in the parentheses are % growth over the previous quarter.

Source: Compiled from TRAI (2003[a], 2003[b], 2004[a], 2004[b]).

For Pre-paid paid mobile services, the revenue per subscriber has increased in A category and B category of circles at an average quarterly growth rate of 2.51 and 0.48%, respectively. However, in the case of C category and M category of circles it has fallen at the rate of -4.55 and -3.09%, respectively. The average quarterly growth of revenue per subscriber for the post-paid services is 1.39 in B category of circles whereas, this growth rate is found to be negative for the rest of the categories of circles such as A (-7.07%), C (-17.39%)% and M (1.11%).

Revenue Realized Per Minute of Usage

The ratio of RPS (as given in Table 5) to MOU (as given in Table 2) is equal to the RRPMOU. The data generated on RRPMOU for the pre-paid and post-paid subscribers are provided in Tables 6 and 7, respectively.

The revenue realized per minute of usage for pre-paid subscriber has declined in all the circles in March 2004 in comparison to March 2003. However, the pre-paid subscribers of circle 'C' paid the highest revenue per minute of usage (i.e., Rs. 1.48) while it is lowest in the case of circle 'B' (Rs. 0.97) for the quarter ending March 2004.

For the post-paid subscriber, the revenue realized per minute of usage shows a declining trend since September 2003 for all the categories of circles. The quarter ending June 2003 has also registered a fall in the revenue realized per minute of usage over its previous quarter for the circle category 'B' and 'M'. The revenue realized per minute of usage was found to be highest for 'M' category of circles (Rs. 1.95) for the quarter ending March 2004, while the subscribers of 'A' category circles were paying least revenue per minute of usage (Rs. 1.37).

Revenue Realized Per Minute of Outgoing Usage

RRPMOOGU variable has been constructed by using the Call Revenue Per Subscriber Per Month (CRPSPM) and percentage of revenue from call charges at the national level. The information on percentage of revenue from call charges at the national level is presented in Table 9.

The CRPSPM is computed by multiplying the revenue per subscriber per

Table 6: Revenue Realized Per Minute of Usage for Pre-paid Subscribers

Circles Category	March 2003 (Rs.)	June 2003 (Rs.)	September 2003 (Rs.)	December 2003 (Rs.)	March 2004 (Rs.)
A	1.64	1.60 (-2.44)	1.54 (-3.75)	1.36 (-11.69)	1.20 (-11.76)
B	1.98	2.04 (3.03)	1.79 (-12.25)	1.41 (-21.23)	0.97 (-31.21)
C	5.11	3.82 (-25.24)	2.80 (-26.70)	1.47 (-47.50)	1.48 (0.68)
M	2.13	1.64 (-23.00)	1.41 (-14.02)	1.28 (-9.22)	1.28 (0.00)

Note: Figures in the parentheses are % growth over previous quarter.

Source: Author.

Table 7: Revenue Realized Per Minute of Usage for Post-paid Subscribers

Circles Category	March 2003 (Rs.)	June 2003 (Rs.)	September 2003 (Rs.)	December 2003 (Rs.)	March 2004 (Rs.)
A	1.73	2.05 (18.50)	1.59 (-22.44)	1.56 (-1.89)	1.37 (-12.18)
B	2.18	1.99 (-8.72)	1.85 (-7.04)	1.54 (-16.76)	1.48 (-3.90)
C	4.91	5.75 (17.11)	4.77 (-17.04)	3.40 (-28.72)	1.89 (-44.41)
M	2.24	2.12 (-5.36)	1.98 (-6.60)	1.98 (0.00)	1.95 (-1.52)

Note: Figures in the parentheses are % growth over the previous quarter.

Source: Author.

month, (in Table 5) with the respective percentage of revenue generated from call charges, (in Table 8), at the national level of aggregation. Table 9 provides the call Revenue Per Subscriber Per Month (CRPSPM) for the pre-paid and post-paid subscribers.

Table 9 shows that the average quarterly growth in call revenue per subscriber per month is positive for pre-paid subscribers in all the categories of circles whereas, it is positive only in B category and M category of circles for the post-paid subscribers. The pre-paid subscribers have an average quarterly growth rate of 6.15, 4.71, 0.51 and 0.58% for A, B, C and M category of circles, respectively. It was -2.12, 5.39, 14.43 and 4.67% in the case of A, B, C and M category of circles, respectively. In the second step, in order to obtain the revenue realized per minute of outgoing usage, ratio of call revenue per subscriber per month (in Table 9) to outgoing minutes of usage per subscriber per month (in Table 4), is computed. Table 10 shows

Table 8: Percentage of Revenue from Call Charges

	March 2003		June 2003		September 2003		December 2003		March 2004	
	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid	Pre-paid	Post-paid
India	57	33	52	29	55	32	68	37	66	40

Source: Compiled from TRAI (2003[a], 2003[b], 2004[a]).

Table 9: Call Revenue Per Subscriber per Month

Circles Category	March 2003 (Rs.)	June 2003 (Rs.)	September 2003 (Rs.)	December 2003 (Rs.)	March 2004 (Rs.)	Average Quarterly Growth
Pre-paid Subscribers						
A	149.71	141.69 (-5.36)	182.97 (29.13)	193.05 (5.51)	184 (-4.69)	6.15
B	161.18	149.96 (-6.96)	169.27 (12.88)	205.88 (21.63)	187.96 (-8.70)	4.71
C	243.21	199.6 (-17.93)	194.47 (-2.57)	265.95 (36.76)	228.19 (-14.20)	0.51
M	168.46	151.51 (-10.06)	162.7 (7.39)	178.2 (9.53)	170.15 (-4.52)	0.58
Post-paid Subscribers						
A	345.63	306.68 (-11.27)	336.01 (9.56)	338.92 (0.87)	313.09 (-7.62)	-2.12
B	260.53	307.85 (18.16)	352.83 (14.61)	326.73 (-7.40)	314.3 (-3.80)	5.39
C	645.76	634.67 (-1.72)	614.46 (-3.18)	356.66 (-41.96)	317.91 (-10.86)	-14.43
M	452.98	391.01 (-13.68)	435.3 (11.33)	498.22 (14.45)	531.05 (6.59)	4.67

Note: Figures in the parentheses are % growth over previous quarter.

Source: Author.

Table 10: Revenue Realized Per Minute of Outgoing Usage

Circles Category	March 2003 (Rs.)	June 2003 (Rs.)	September 2003 (Rs.)	December 2003 (Rs.)	March 2004 (Rs.)	Average Quarterly Growth
Pre-paid Subscribers						
A	3.49	2.86 (-18.05)	2.91 (1.75)	2.95 (1.37)	2.92 (-1.02)	-3.99
B	4.2	3.91 (-6.90)	2.88 (-26.34)	2.8 (-2.78)	2.07 (-26.07)	-15.52
C	10.85	7.32 (-32.53)	7.66 (4.64)	2.92 (-61.88)	2.87 (-1.71)	-22.87
M	4.53	3.53 (-22.08)	3.37 (-4.53)	4.33 (28.49)	4.43 (2.31)	1.05
Post-paid Subscribers						
A	1.38	1.43 (3.62)	1.17 (-18.18)	1.09 (-6.84)	1.31 (20.18)	-0.30
B	1.74	1.32 (-24.14)	1.27 (-3.79)	1.21 (-4.72)	1.26 (4.13)	-7.13
C	3.92	4.1 (4.59)	3.28 (-20.00)	2.85 (-13.11)	1.81 (-36.49)	-16.25
M	1.79	1.32 (-26.26)	1.42 (7.58)	1.63 (14.79)	1.78 (9.20)	1.33

Note: Figures in the parentheses are % growth over previous quarter.

Source: Author.

the revenue realized per minute of outgoing usage for pre-paid and post-paid subscribers.

The average quarterly growth in revenue realized per minute of outgoing usage for pre-paid subscribers is -3.99, -15.52, -22.87, and 1.05% for A, B, C and M category of circles, respectively. It is -0.30, -7.13, -16.25, and 1.33% for A, B, C and M category of circles, respectively, in the case of post-paid subscribers.

EMPIRICAL RESULTS

ESTIMATES OF MOU FOR PRE-PAID SUBSCRIBERS

Table 11 gives the estimation result of MOU for the pre-paid subscribers by using linear panel data model.

It could be seen from the above table that the null hypothesis of no individual effect cannot be rejected based on LM statistics. This implies that the pooled regression model is preferred to the fixed effect and random effect model. The coefficient of revenue realized per minute of usage is equal to -44. It has the expected sign and it is statistically significant at 1% level. The corresponding intercept is equal to 268.74.

Using the intercept and the slope coefficient obtained from the pooled regression model, the estimated minutes of usage for each quarter in each circle is obtained. For example, the estimated minutes of usage is 196.51 for the observed price Rs. 1.64 in the case of A category circle for the quarter ending March 2003 (in Table 12). Since this is a linear model, the price elasticity of demand can be computed by multiplying the price coefficient with the ratio of observed price and the corresponding estimated minutes of usage as explained in equation 3.

Table 11: Price Determinant of Demand for Pre-paid Cellular Mobile Services—Estimates of Linear Panel Data Model

Dependent Variable: MOU

Variables	Pooled Regression	Fixed Effect		Random Effect
Constant	268.74 (16.32)*	A	283.71 (15.32)*	280.04 (15.86)*
		B	288.69 (14.72)*	
		C	333.66 (11.47)*	
		M	277.23 (14.57)*	
RRPMOU	-44.00 (-5.78)*	-58.28 (-6.63)*		-49.96 (-6.44)*
R^2	0.65	0.76		–
F	33.51*	11.97*		–
Degree of Freedom	18	15		18

LM Statistics = 0.00 (1 df, prob value = 0.98)
Hausman Statistics = 3.69 (1 df, prob value = 0.05)

Note: 1) *t* values are given in the parentheses.
2) * Refers to significant at 1% level.

Source: Estimated by using equation (2).

Accordingly, the price elasticity is -0.37 i.e., $\left[\left(\frac{1.64}{196.51}\right)\times(-44.00)\right]$ for 'A' category circle for the quarter ending March 2003. In the same way, the computed estimated minutes of usage and the corresponding price elasticities for each observed price for each circle is presented in Table 12.

The lowest price elasticity of usage demand is -0.19 for the subscribers of 'B' category circles for the quarter ending March 2004. Whereas, the highest price elasticity of usage demand is -5.11 for the quarter ending March 2003 for 'C' category of circles. However, it could be noticed from Table 12 that the price elasticity of MOU has shown a declining trend in all the categories of circles.

ESTIMATES OF MOU FOR POST-PAID SUBSCRIBERS

Similarly, the linear panel data estimates of MOU for the post-paid subscribers are presented in Table 13.

It could be noticed from Table 13 that, although the coefficients of revenue realized per minute of usage of these models have the expected signs, they are not competing. Price is the only explanatory variable in the model and the price coefficient is significant only in the case of the pooled regression model. That's why the model selection has not been attempted using LM statistics and Hausman statistics. Thus, the estimated minutes of usage and price elasticity for the post-paid subscribers are computed and presented in Table 14 using the result obtained from the pooled regression model

Table 12: Estimated Minutes of Usage and Price Elasticity of Demand for Pre-paid Subscribers

Circles Category	Quarter Ending	Estimated Minutes of Usage	Elasticity
A	March 2003	196.51	-0.37
	June 2003	198.24	-0.36
	September 2003	201.02	-0.34
	December 2003	209.10	-0.29
	March 2004	216.05	-0.24
B	March 2003	181.67	-0.48
	June 2003	178.88	-0.50
	September 2003	190.15	-0.41
	December 2003	206.61	-0.30
	March 2004	225.94	-0.19
C	March 2003	43.97	-5.11
	June 2003	100.58	-1.67
	September 2003	145.75	-0.84
	December 2003	204.05	-0.32
	March 2004	203.68	-0.32
M	March 2003	175.00	-0.54
	June 2003	196.58	-0.37
	September 2003	206.70	-0.30
	December 2003	212.35	-0.27
	March 2004	212.54	-0.26

in the same way as computed in Table 12 for the pre-paid subscribers.

The estimated values of elasticity coefficients for the different categories of circles are interesting to observe. While the elasticity values have declined in 'B' and 'M' category of circles, fluctuations in these values are observed in the case of 'A' and 'C' category. There is an increase in the elasticity values for these categories of circles for the quarter ending June 2003. These values have declined from -0.24 and -0.25 for the quarter ending March 2003 to -0.15 and -0.21 for the quarter ending March 2004, for category B and M, respectively. The lowest price elasticity of usage demand is -0.14 for the subscribers of 'A' category circles during the quarter ending March 2004 whereas, the highest price elasticity is -1.06 for the subscribers of 'C' category circles for the quarter ending June 2003.

ESTIMATES OF OGMOU FOR PRE-PAID SUBSCRIBERS

The estimated outgoing minutes of usage are also obtained using the linear panel data model. The estimation results for the pre-paid subscribers are given in Table 15.

In Table 15 the LM statistics is not significant at the conventional level thereby, rejecting the null hypothesis of nonrandom individual effects. It implies

Table 13: Price Determinant of Demand for Post-paid Cellular Mobile Services: Estimates of Linear Panel Data Model

Dependent Variable: MOU				
Variables	**Pooled Regression**	**Fixed Effect**		**Random Effect**
Constant	681.72 (14.56)*	A	603.84 (14.21)*	593.16 (10.02)*
		B	535.78 (11.97)*	
		C	418.56 (4.89)*	
		M	678.50 (13.94)*	
RRPMU	-60.96 (-3.53)*	-10.27 (-0.525)		-24.33 (-1.38)
R^2	0.41	0.79		–
F	12.47	14.42		–
Degree of freedoms	18	15		18

LM Statistics = 5.40 (1 df, prob value = 0.02)
Hausman Statistics = 2.77 (1 df, prob value = 0.095)

Note: 1) *t* values are given in the parentheses.
2) * Refers to significant at 1% level.

Source: Estimated by using equation (2).

Table 14: Estimated Minutes of Usage and Price Elasticity of Demand for Post-paid Subscribers

Circles Category	Quarter Ending	Estimated Minutes of Usage	Elasticity
A	March 2003	576.02	-0.18
	June 2003	556.59	-0.22
	September 2003	584.73	-0.17
	December 2003	586.81	-0.16
	March 2004	598.45	-0.14
B	March 2003	548.78	-0.24
	June 2003	560.15	-0.22
	September 2003	569.00	-0.20
	December 2003	587.67	-0.16
C	March 2004	591.49	-0.15
	March 2003	382.53	-0.78
	June 2003	330.96	-1.06
	September 2003	390.70	-0.74
	December 2003	474.58	-0.44
M	March 2004	566.22	-0.20
	March 2003	545.20	-0.25
	June 2003	552.47	-0.23
	September 2003	560.88	-0.22
	December 2003	560.88	-0.22
	March 2004	562.77	-0.21

that the PR model is a better model. In this case, the price coefficient and the intercept are equal to -7.03 and 81.00. Using this intercept and the common slope coefficient obtained from PR model, the estimated outgoing minutes of usage and the corresponding price elasticities are computed and provided in Table 16.

The elasticity for the pre-paid subscribers for category A has declined from -0.43 in the quarter ending March 2003 to -0.34 in the quarter ending March 2004. It has declined from -0.57 and -16.21 to -0.22 and -0.33 in the same period for B and C category of circles, respectively. However, there is a fluctuation in these elasticities for category M. The highest price elasticity is -0.65 in quarter ending March 2003. Nevertheless, the lowest price elasticity of usage demand is -0.22 for the subscribers of 'B' category circles during the quarter ending March 2004 whereas, the highest price elasticity is -16.21 for the subscribers of 'C' category circles for the quarter ending March 2003.

ESTIMATES OF OGMOU FOR POST-PAID SUBSCRIBERS

In the same way, outgoing minutes of usage is estimated for the post-paid subscribers and the estimation result is given in Table 17.

In Table 17, the low value of LM statistics shows that the null hypothesis of non-random individual effect cannot be rejected even at 10% level of significance. Hence, pooled regression model is the preferred model. Using the intercept and the slope coefficients obtained from the pooled regression model

Table 15: Price Determinant of Demand for Pre-paid Cellular Mobile Services: Estimates of Linear Panel Data Model

Dependent Variable: OGMOU

Variables	Pooled Regression	Fixed Effect		Random Effect
Constant	81.00 (11.28)*	A	87.13 (12.89)*	88.06 (12.14)*
		B	91.81 (13.28)*	
		C	112.64 (10.36)*	
		M	82.14 (10.39)*	
CRPMOOGU	-7.03 (-4.53)*	-10.04 (-6.55)*		-8.74 (-6.27)*
R^2	0.53	0.78		–
F	20.60	12.97		–
Degree of freedom	18	15		18

LM Statistics = 2.27 (1df, prob value = 0.13)
(Hausman Statistics = 4.11 (1df, prob value = 0.04)

Note: 1) *t* values are given in the parentheses.
2) * Refers to significant at 1% level.

Source: Estimated by using equation (2).

Table 16: Estimated Outgoing Minutes of Usage and Price Elasticity for Pre-paid Subscribers

Circles Category	Quarter Ending	Estimated Minutes of Usage	Elasticity
A	March 2003	56.48	-0.43
	June 2003	60.91	-0.33
	September 2003	60.56	-0.34
	December 2003	60.25	-0.34
	March 2004	60.44	-0.34
B	March 2003	51.45	-0.57
	June 2003	53.50	-0.51
	September 2003	60.77	-0.33
	December 2003	61.29	-0.32
	March 2004	66.45	-0.22
C	March 2003	4.71	-16.21
	June 2003	29.54	-1.74
	September 2003	27.18	-1.98
	December 2003	60.48	-0.34
	March 2004	60.84	-0.33
M	March 2003	49.18	-0.65
	June 2003	56.18	-0.44
	September 2003	57.31	-0.41
	December 2003	50.59	-0.60
	March 2004	49.83	-0.63

for each quarter in each circle the estimated outgoing minutes of usage is obtained. The estimated minutes of usage and the price elasticity of usage demand corresponding to each price are given in Table 18.

The consistent declining trend in price elasticity is not observed in all the categories of circles across the different quarters. However, the price elasticity in March 2004 has declined in all the categories of circles against March 2003. In 'A' and 'M' category of circle the price elasticity has fallen marginally from -0.24 to -0.23and -0.34 to -0.33, respectively. However, there is a sharp fall in the price elasticities in the case of 'B' and 'C' category of circles during the same period of time. While 'B' category of circle has registered a fall in the price elasticities from -0.33 to -0.22, in the case of 'C' category of circle the fall was from -1.23 to -0.34 during the same period of time. The lowest price elasticity of usage demand is -0.18 for the subscribers of 'A' category circles for quarter ending at December 2003 whereas, the highest price elasticity of usage demand is -1.36 for the subscribers of 'C' category circles for the quarter ending June 2003.

Table 17: Price Determinant of Demand for Post-paid Cellular Mobile Services: Estimates of Linear Panel Data Model

Dependent Variable: OGMOU				
Variables	Pooled Regression	Fixed Effect		Random Effect
Constant	321 (14.33)*	A	287.99 (10.27)*	299.87 (9.47)*
		B	264.60 (9.00)*	
		C	229.58 (3.82)*	
		M	325.92 (9.09)*	
CRPMOOGU	-45.30 (-4.16)*	-21.33 (-1.17)		-33.65 (-2.37)*
R^2	0.48	0.71		
F	17.27	9.59		
Degree of freedom	18	15		18

LM Statistics = 2.14 (1df, prob value = 0.14)

Hausman Statistics = 1.18 (1df, prob value = 0.28)

Note: 1) *t* values are given in the parentheses.

2) * Refers to significant at 1% level.

Source: Estimated by using equation (2).

Table 18: Estimated Outgoing Minutes of Usage and Price Elasticity for Post-paid Subscribers

Circles Category	Quarter Ending	Estimated Minutes of Usage	Elasticity
A	March 2003	258.75	-0.24
	June 2003	256.85	-0.25
	September 2003	268.48	-0.20
	December 2003	272.28	-0.18
	March 2004	262.32	-0.23
B	March 2003	242.60	-0.33
	June 2003	261.55	-0.23
	September 2003	263.82	-0.22
	December 2003	266.50	-0.21
	March 2004	264.20	-0.22
C	March 2003	143.98	-1.23
	June 2003	135.95	-1.36
	September 2003	172.66	-0.86
	December 2003	192.16	-0.67
	March 2004	239.43	-0.34
M	March 2003	240.47	-0.34
	June 2003	261.83	-0.23
	September 2003	256.92	-0.25
	December 2003	247.70	-0.30
	March 2004	240.82	-0.33

ESTIMATION OF WELFARE IMPLICATIONS OF PRICE CHANGES

Reduction in the price of telecom services and the resultant change in the usage demand, generates welfare changes. The welfare implications of such changes in price on the subscribers in the form of a change in the consumer surplus has been computed for each category of circle in the case of pre-paid and post-paid subscribers. The result of the changes in consumer surplus as a result of a change in the observed price over the previous quarter is provided in Table 19 by the four categories of circles.

For pre-paid cellular mobile subscribers, the maximum change in consumer surplus is observed as a result of change in RRPMOU and the resultant change in MOU in circle category 'C' to the extent of Rs. 231.77 for the quarter ending December 2003. For post-paid cellular mobile subscribers, the maximum change in the consumer surplus is observed as a result of a change in RRPMOU and the resultant change in MOU in circle category 'C' to the extent of Rs. 782.24 for the quarter ending March 2004. For the pre-paid cellular mobile subscribers, the maximum change in consumer surplus is observed as a result of change in the RRPMOOGU and the resultant change in OGMOU in circle category 'C' to the extent of Rs 207.64 for the quarter ending December 2003. For the post-paid cellular mobile subscribers, the maximum change in consumer surplus is observed as a result of change in RRPMOOGU and the resultant change in OGMOU in circle category 'C' to the extent of Rs. 225.16 for the quarter ending March 2004. The analysis of welfare implications based on the consumer surplus indicates that the subscribers in the 'C' category of circles are the major beneficiaries of these price changes. In fact, in the post-paid segment, after an initial welfare loss the subscribers in 'C' category of circle have experienced large positive change in the consumer surplus. It could be observed from Table 19 that the post-paid subscribers in 'C' category of circles have gained Rs. 353.65, Rs. 595.31 and Rs. 782.24 for the quarter ending September 2003, December 2003 and March 2004, respectively. On the other hand the post-paid subscribers in the Metro Category of circles have experienced a welfare loss during the same period. The welfare losses for the post-paid subscribers in Metro categories of circles are Rs. 28.08, Rs. 51.36 and Rs. 37.12 for the quarter ending September 2003, December 2003 and March 2004, respectively.

CONCLUSIONS

The MOU and OGMOU are used as the measure of the usage demand for mobile services, whereas RRPMOU and RRPMOOGU are used as the measure for the price variables. Price elasticities of usage demand for cellular phone services are estimated in India by using panel data models. Moreover, the welfare implications in terms of changes in consumer surplus are derived by the four categories of mobile telecom circles. The empirical findings show the evidence that, the competition in the provisioning of telecommunication services and the resultant fall in the usage price has benefited the subscribers of all the categories of circles. The 'C' category circle which is relatively poor in terms

Table 19: Estimated Changes in Consumer Surplus

Circles Category	Quarter Ending	Changes in Consumer Surplus Per Subscriber (Rs.) Due to			
		Change in Revenue Realized Per Minutes of Usage		Change in Revenue Realized Per Unit of Outgoing Usage	
		Pre-paid	Post-paid	Pre-paid	Post-paid
A	June 2003	7.73	-180.51	36.99	-10.81
	September 2003	12.61	263.42	-3.06	67.42
	December 2003	37.67	20.06	-2.65	22.65
	March 2004	33.59	113.10	1.60	-58.76
B	June 2003	-11.43	103.40	15.36	105.45
	September 2003	47.26	81.96	59.05	13.19
	December 2003	74.21	177.20	4.54	15.69
	March 2004	95.02	36.91	46.88	-13.51
C	June 2003	92.99	-301.81	60.51	-24.79
	September 2003	126.43	353.65	-9.55	125.03
	December 2003	231.77	595.31	207.64	78.55
	March 2004	-1.73	782.24	3.07	225.16
M	June 2003	91.12	65.44	52.47	118.39
	September 2003	46.38	76.78	9.08	-28.08
	December 2003	26.91	-0.01	-51.54	-51.36
	March 2004	0.92	17.43	-5.43	-37.12

Source: Computed by using equation 4.

of the economic criteria such as per capita net state domestic product (see Appendix 2) yields the maximum benefit in terms of the change in consumer surplus. These results indicate that the distributive implication of price changes, as a result of competition in mobile telephony, is positive for India.

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Appendix 1: Mobile Service Areas in India

Circle A	
Andhra Pradesh	
Gujarat	+ (Dadra and Nagarhaveli)
Karnataka	
Maharashtra	– {Mumbai + New Mumbai (Mumbai) + Kalyan} + Goa
Tamil Nadu	{Chennai + MEPZ) + Minjur + – Mahabalipuram}
Circle B	
Harayana	–(Faridabad and Gurgaon)
Kerala	+ Lakshadweep
Rajasthan	
Punjab	
Madhya Pradesh	+ Chhattisgarh
UP(E)/UP(W)	–(Ghazibad and Noida)
West Bengal	–Kolkota + Sikkim
Circle C	
Andaman and Nicobar	
Assam	
Bihar	+ Jharkhand
Himachal Pradesh	
Jammu and Kashmir	
North East	Arunachal + Tripura + Meghalaya + Mizoram + Nagaland + Manipur
Orissa	
Metros (M)	
Delhi	Includes Faridabad, Gurgaon, Ghaziabad and Noida
Mumbai	New Mumbai + Kalyan
Kolkota	
Chennai	Includes Minjur, Maraimalai Nagar Export Promotion Zone (MEPZ) and Mahabalipuram
	Source: DOT (2002).

Appendix 2 : Per Capita Net State Domestic Product (NSDP) by Telecom Circle in 2002-03

Circles	Per Capita NSDP (Rs.)
A	
Andhra Pradesh	18,820
Gujarat	22,838
Karnataka	19,865
Maharashtra *	16,609
Tamil Nadu	21,740
Haryana	26,974
B	
Kerala	22,776
Rajasthan	12,745
Punjab	26,032
Madhya Pradesh ♦	11,671
Uttar Pradesh ♣	10,031**
West Bengal ♠	18,562
C	
Andaman And Nicobar	28,340
Assam	12,074
Bihar∇	7,115
Himachal Pradesh	22,671
Jammu and Kashmir	13,320**
NE #	17,022
Orissa	10,208

Circles Category	Per Capita Income (Rs.)	Average of PCNSDP (Rs.)	CV of PCNSDP Within the Circle Category
A	**19,447**	**21,141**	**17**
B	**13,945**	**16,970**	**38**
C	**9,739**	**15,867**	**47**
Total	**15,305**	**18,107.35**	**35**

Note: 1) Each telecom circle is co-terminus with a state though with a few exceptions. An approximation of the per capita state domestic product by circle is obtained with the following adjustments.

NE includes: Arunachal, Tripura, Meghalaya, Mizoram and Manipur

* Maharashtra includes Goa.

♦ Madhaya pradesh includes Chatisgarh.

♣ UP includes Uttaranchal.

♠ West Bengal includes Sikkim.

∇ Bihar includes Jharkhand.

** NSDP data for Uttaranchal and Jammu and Kashmir pertain to the financial year 2001-02.

2) Since the service area for various telecom circles has been divided into different categories depending on their size, eligibility conditions, performance guarantee etc., (DOT, 2002), it would be interesting to compare their income level with their usage demand and usage price. As the service areas in many cases do not match with one or a combination of states it is difficult to arrive at the circle level per capita income.

Source: Computed by using GOI (2004).

Problem Management in Public Sector: An Empirical Study

*Avinash Kumar Srivastav**

Problems encountered in performing an organizational role that leads to stress. Coping with role, stress means managing problems in the organization. Problem management is studied in a large public sector industry, using Role-PICS (O) instrument for measuring eight strategies (styles) of coping with role stress on 155 randomly selected executives. Defending the Self and Making Self Effort *were found to be the dominant and backup problem management strategies, respectively. In the organization, where the study was done, problems are generally denied or rationalized in the normal circumstances; but when under pressure, solutions for these problems are attempted through self-effort by the organizational members. Correlation analysis has revealed 13 negative and 3 positive inter-correlations among eight problem management strategies. Factor analysis of problem management styles has identified four meta-strategies (or combinations of basic strategies), viz.,* Confrontation, Externalized Blaming, Self-Blaming, and Don Quixote *strategies, which are adopted by the organization for management of problems encountered.*

INTRODUCTION

Problem is an event arising from a threat or discrepancy between what is desired and what is obtained (Nezu *et al.*, 2001). Problems are commonly encountered by individuals, groups and organizations. Sometimes the problems are not obvious but hidden, holding even greater potential to harm because they can catch us unawares. At any point of time, even if we solve all the problems, new ones would soon appear. We can never run away from problems. If we do, the problems will knock us down. It is necessary to develop a healthy outlook towards problems, seizing them as opportunities for improvement. Problems need to be confronted as and when they appear. Solving problems is good but that is not an end in itself. It is essential to prevent the future occurrence of the problems whenever possible or at least to reduce their frequency of occurrence and the magnitude of their negative impact.

Often the problems are complex enough and it is beyond the competence of an individual to solve them. In such cases, we must involve others to join in for solving the problems. Conscious efforts should be made not to deny, suppress,

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hide or rationalize the problems. Problems need to be acknowledged, shared and solved through self-effort/others' effort/joint effort of the self and others. Never making any self-effort and transferring all the problems to others for solution as a routine would result in impairment of individual and organizational effectiveness. Never involving others, attempting to solve all the problems through self-effort can also be dysfunctional. Discretion must be applied when a problem can be solved through self-effort, through others' effort or through joint efforts. Who caused the problem is unimportant. Hence blaming self or others does not help. Self-blaming jeopardizes one's *Self-Efficacy* (Bandura, 1986 and 1997). Blaming others adversely influences relationships with those blamed. It is very important to know what could have prevented the occurrence of such a problem, so that a safeguarding mechanism could be built to inhibit its recurrence.

Problem Management refers to ways of managing the problems. Problems are potential stressors and managing problems is similar to coping with stress. *Coping Strategy Framework* (Pareek, 1987 and 2002, pp. 487-491) for dealing with role stress, known as Role PICS, is therefore relevant for the study of problem management in organizations.

Problem management is an important dimension of *Organizational Climate* (Pareek, 1989 and 2004, pp. 411-414). Problems are managed in different ways under different types of dominant motivational climate in the organization. When Achievement climate is dominant in the organization, the problems are taken as challenges. Experts play an important role in solving the problems when Expert Influence is dominant. When Extension climate is dominant, needs of the organizational members as well as the society at large are duly considered while dealing with the problems. Problems are solved by the supervisors without involving the subordinates when *Control* climate is dominant. When Dependency climate is dominant, problems are referred to superiors and solutions are sought from them. Friends are consulted for dealing with the problems, when Affiliation climate is dominant.

When the problem management is poor, problems repeat and multiply. The concerned individuals, groups and organizations are overwhelmed with problems, having little time for anything else. When problem management is good, the same problem generally does not repeat. In rare cases, if it repeats, its frequency of occurrence and its negative impact are substantially reduced. Good problem management therefore enables the individuals, groups and organizations to focus on development, growth and matters of strategic importance.

Public sector is generally ridden with multiplicity of problems, which are often not attended to. Multiple objectives and environmental demands have created complex goal conflicts for the public sector. Excessive government control, political interference, bureaucratic working, lack of initiative and risk-taking, lack of recognition for merit, seniority based promotions, nepotism and absolute job security have resulted in dysfunctional organizational ethos, culture, working environment and climate in the public sector. Lack of concern for quality, productivity, profitability, efficiency and customer satisfaction are predominant, jeopardizing public sector performance in all dimensions (Di Lodovico *et al.,* 2001). In the context of globalization and liberalization, public sector cannot survive unless it becomes as effective as the private sector. The present study is aimed at understanding the dynamics of problem management in public sector, thus giving an insight on realization of public sector effectiveness through effective problem management.

UNDERSTANDING COPING AND COPING STRATEGY

Coping signifies how we deal with a potential stressor or the resulting stressful situation to minimize the harmful consequences. It consists of efforts (either intra-psychic or action-oriented) to manage the internal or external demands and conflicts (Lazarus and Launier, 1978, p. 311). Potential stressors are processed through the person concerned. When coping is effective, a potential stressor may get dissipated (not resulting in a stressful situation) (Igodan and Newcomb, 1986). *Coping Strategy* (Taylor *et al.,* 1998) means strategy adopted for coping with stress. It consists of behavioral or psychological efforts made to handle stressful events, minimizing the harmful consequences.

MEASUREMENT OF COPING STRATEGY

Assessment of coping strategy was earlier based on personality test. Folkman and Lazarus (1980) developed an instrument for measurement of coping strategy based on observation of individual behavior in stressful situations. Their first instrument called Ways of Coping (WOC) comprised 68 items. Factor analysis of WOC led to development of *Ways of Coping Checklist* (WCCL) (Folkman and Lazarus, 1985), comprising 50 items. WCCL measures eight coping strategies (*Constructive Coping*, *Distancing*, *Self-control*, *Seeking Social Support*, *Accepting Responsibility*, *Escape-avoidance*, *Planful Problem – Solving* and *Positive Reappraisal*).

PROJECTIVE INSTRUMENT FOR COPING STRATEGY

Rosenzweig, (1978) had used cartoon like pictures for the study of frustration. Pareek (1987 and 2002, pp. 487-491) adopted a similar approach and developed Role-PICS, a *Projective Instrument for Coping Strategy* (PICS) related to roles. It has three forms: Role-PICS (G), Role-PICS (E) and Role–PICS (O) for general, entrepreneurial and organizational roles, respectively. Role-PICS (O) (Pareek, 2002, pp. 620-625) has 24 pictures relating to different role stressors, depicting a boss, peer, subordinate or spouse asking a question. The respondent is required to write his response to the question based on his/her immediate reaction. Respondent's response for each picture is evaluated to identify the type(s) of coping strategy used in the situation depicted. Reproduced in a simplified form (omitting the pictures), the instrument is placed as Annexure to this paper.

PROBLEM MANAGEMENT STRATEGIES

Basically there are two ways of dealing with stress or problems (Pareek, 1977). The first one is based on a pessimistic disposition that problems cannot be solved and they have to be avoided, some how or the other. This represents Avoidance Mode in Role-PICS. The second one is based on an optimistic disposition that problems need to be solved and they can be solved. This represents Approach Mode in Role-PICS. Based on Internality (Extent of engaging the self with the problems) and Externality (Extent of engaging others with the problems) being low or high, the avoidance mode represents four dysfunctional problem management strategies in Role-PICS. Similarly, the approach mode represents four functional problem management strategies in Role-PICS.

DYSFUNCTIONAL STRATEGIES

(i) Fatalistic Thinking: Problems are believed to be inevitable and unsolvable. They are readily accepted without reaction. Nobody is blamed for the problems and no effort is made to solve them. Denoted by **M**, this style has been named as Impunitive in Role-PICS. It comprises low internality, low externality and avoidance mode.

(ii) Blaming the Self: It is believed that problems are because of one's own shortcomings, lack of competencies or wrongdoings. The individual concerned lacks self-confidence and does not take any remedial measure. Denoted by **I**, this style has been named as Intropunitive in Role-PICS. It comprises high internality, low externality and avoidance mode.

(iii) Blaming the External Agency: It is believed that problems have appeared because of shortcomings, lack of competencies or wrongdoings by others. The person concerned does not take any responsibility for the problem and its solution. Denoted by **E**, this style has been named as Extrapunitive in Role-PICS. It comprises low internality, high externality and avoidance mode.

(iv) Defending the Self: It is apprehended that blame for the problems would be attributed to the self. This manifests in denying the very existence of the problems when possible to defend the self. When denial is not possible, problems are rationalized by pointing out benefits therefrom to cover up one's own perceived deficiencies. Denoted by **D**, this style has been named as Defensive in Role-PICS. It comprises high internality, high externality and avoidance mode.

FUNCTIONAL STRATEGIES

(i) Wishful Thinking: It is believed that problems will eventually take care of themselves and nobody need do anything about them. Denoted by **m**, this style has been named as Impersistive in Role-PICS. It comprises low internality, low externality and avoidance mode.

(ii) Making Self Effort: The individual concerned addresses the problems by taking the responsibility of solving them without involving others. Denoted by **i**, this style has been named as Intropersistive in Role-PICS. It comprises high internality, low externality and approach mode.

(iii) Seeking External Effort: The individual concerned addresses the problems by transferring the responsibility for solving the problems to others without involving the self. Denoted by **e**, this style has been named as Extrapersistive in Role-PICS. It comprises low internality, high externality and approach mode.

(iv) Making Team Effort: Believing in teamwork, the person concerned shares the problems with others and makes joint efforts with others to solve the problems. Denoted by **n**, this style has been named as Interpersistive in Role-PICS. It comprises high internality, high externality and approach mode.

PROBLEM MANAGEMENT ILLUSTRATION

Problem Management Strategies (Styles) have been illustrated below for a sample problem as follows:

The Problem: There is a shortage of competent people in an organization. The boss has a natural tendency to allot urgent and important work to those who are competent. All the competent people are thus getting overloaded with work whereas the incompetent ones continue to be underloaded and are relatively free.

Ways of Dealing with the Problem: If you happen to be one of those competent people in the organization in question, getting overloaded with work, you may select one of the following eight alternatives to deal with the situation.

1. Accepting the problematic situation, believing that work overload is a common thing in organizations and nothing can be done about it. This represents Fatalistic Thinking.
2. Believing that work overload is because you are slow at work but doing nothing to solve the problem. This represents Blaming the Self.
3. Believing that your overloading is because your boss is unreasonable but doing nothing to solve the problem. This represents Blaming the External Agency.
4. Declaring that you really enjoy doing a lot of work like this and it is not a problem for you. This represents Defending the Self.
5. Believing that it is a temporary phase and the problem will eventually get resolved. This represents Wishful Thinking.
6. You take action to enhance your skills to become faster in your work. This represents Making Self Effort.
7. You will take the help of your peers to deal with work overload. This represents Seeking External Effort.
8. You will work with your other competent peers (who are overloaded) to train those who are incompetent and therefore underloaded. This represents *Making Team Effort.*

OBJECTIVES OF THE STUDY

The study is aimed at developing a better understanding of problem management and how it is done in the selected public sector industry through the following:

- Identifying the dominant and backup problem management strategies in the organization.
- Determining the correlation between different problem management strategies.
- Identifying the meta-strategies for problem management prominent in the organization.

METHODOLOGY

Organization and Variables: A large, multi-unit, multi-location public sector industry was selected for the study. Workshops were conducted in different units and locations, explaining the framework of problem management and its impact on individual and organizational effectiveness and performance. Due care was taken to ensure that the participants in the workshop represented all the diversity present in the organization (age groups, hierarchical levels, educational qualifications and functional groups).

Table1: Respondent Age Profile

	Lower Age	Middle Age	Higher Age	Total
Number	20	57	78	**155**
Percentage	12.9	36.8	50.3	**100**

Table 2 : Respondent Grade Profile

	Junior Management	Middle Management	Senior Management	Total
Number	75	66	14	**155**
Percentage	48.4	42.6	9.0	**100**

Source: Srivastav, 2006.

Table 3 : Respondent Qualification Profile

	Low Qualification	Medium Qualification	High Qualification	Total
Number	49	88	18	**155**
Percentage	31.6	56.8	11.6	**100**

Table 4: Respondent Functional Profile

	R & D Function	Quality Function	Production Function	Miscellaneous Function	Total
Number	13	70	30	42	**155**
Percentage	8.4	45.1	19.4	27.1	**100**

Source: Srivastav, 2007.

Participants were promised that they would receive their individual problem management profiles along with organizational problem management profile and feedback on implications thereof. Role-PICS (O) was administered for measuring eight types of problem management strategy (style) for each respondent. Responses that were complete and error-free constituted 155 Role-PICS (O) samples.

Respondent Profile: Respondents of this study represented different age groups, grades (or management levels), qualification levels and functional affiliations. Respondent age, grade, qualification and functional profiles are furnished in Tables 1, 2, 3 and 4, respectively. Lower, middle and higher age groups comprised respondents in the range of 23-29, 30-39, and 40-58 years, respectively. Junior, middle and senior management levels comprised respondents in grades I-III, IV-V, and VI-VIII, respectively. Low, medium and high qualification levels comprised respondents with lower than graduate technical degree, graduate technical degree, and higher than graduate technical degree, respectively. Functional groups comprised respondents assigned to R&D, production, quality, and miscellaneous function (representing all the remaining functions).

Statistical Analysis: Mean was calculated for each type of problem management style. Rank-ordering of the means for the eight types of problem management strategy was done to identify the dominant (first ranking) and backup (second ranking) problem management strategies (styles) in the organization. As promised, individual and organizational problem management profiles and implications thereof were discussed with the respondents.

Correlation analysis was carried out to study inter-correlation between different pairs of the eight problem management styles. Two tailed significance testing was done. Correlation coefficients with $P \leq 0.05$ were used for interpretation.

Factor analysis was carried out on the eight problem management styles to understand the internal structure of problem management in the organization, determining the meta- strategies (styles) used for problem management. Factors with Eigen Values greater than 1.0 were considered. Factor loadings of lesser than 0.25 were taken as low. Those equal to or greater than 0.25 but lesser than 0.5 were taken as medium. Factor loadings equal to or greater than 0.5 were taken as high. Factor loadings of 0.25 and above were used for interpretation.

RESULTS

Rank Order of Problem Management Styles has been depicted in Table 5. It can be seen that Defending the Self is

Table 5: Problem Management Styles—Mean and Rank

Variable	Mean	Rank
M	4.016	3
I	1.226	6
E	1.703	5
D	7.365	1
m	0.665	8
i	5.000	2
e	3.068	4
n	0.958	7

Table 6: Inter-correlation of Problem Management Styles

		M	I	E	D	m	i	e	n
M	r	**1.000**							
	p	0.000							
I	r	–0.0089	**1.000**						
	p	0.273	0.000						
E	r	0.134	0.038	**1.000**					
	p	0.095	0.638	0.000					
D	r	–0.081	–0.018	**–0.222**	**1.000**				
	p	0.319	0.825	0.006	0.000				
m	r	**–0.185**	–0.104	–0.222	**–0.271**	**1.000**			
	p	0.021	0.196	0.786	0.001	0.000			
i	r	**–0.403**	**–0.166**	**0.209**	**–0.592**	**0.222**	**1.000**		
	p	0.000	0.039	0.009	0.000	0.006	0.000		
e	r	**–0.331**	**–0.159**	**–0.164**	**–0.435**	0.038	**0.233**	**1.000**	
	p	0.000	0.049	0.041	0.000	0.639	0.004	0.000	
n	r	**–0.255**	–0.021	–0.066	**–0.312**	–0.010	0.129	**0.183**	**1.000**
	p	0.001	0.794	0.412	0.000	0.901	0.111	0.023	0.000

the dominant (first ranking) problem management style and Making Self Effort is the backup (second ranking) problem management style. Fatalistic Thinking, Seeking External Effort, Blaming the External Agency, Blaming the Self, Making Team Effort and Wishful Thinking problem management styles rank from third to eighth.

Inter-correlation of Problem Management Styles: Table 6 furnishes the correlation coefficient for each pair of problem management styles.

Blaming the External Agency is negatively correlated with Defending the Self. Fatalistic Thinking and Defending the Self are negatively correlated with Wishful Thinking, Making Self Effort, Seeking External Effort and Making Team Effort. Blaming the Self is negatively correlated with Making Self Effort and Seeking External Effort. Blaming the External Agency is negatively correlated with Making Self Effort and Seeking External Effort. Wishful Thinking is positively correlated with Making Self Effort. Making Self Effort is positively correlated with Seeking External Effort. Seeking External Effort is positively correlated with Making Team Effort.

Factor Analysis of Problem Management Styles: Table 7 furnishes the results of factor analysis of the eight problem management styles. Four factors explaining 71.4% variance have been extracted.

Table 7: Factor Loadings of Problem Management Styles				
Variable	**Factor 1**	**Factor 2**	**Factor 3**	**Factor 4**
M	–0.26910	0.58025	–0.39719	–0.33806
I	–0.03586	0.08862	0.89948	–0.04176
E	–0.01654	0.78980	0.16925	0.00926
D	–0.62687	–0.56804	0.06777	–0.42555
m	–0.26675	0.02344	0.00927	0.87562
i	0.37609	–0.11484	–0.10349	0.62530
e	0.69189	–0.14322	–0.22968	0.03484
n	0.74504	–0.00129	0.16559	–0.18463
Eigen Value	2.27548	1.30732	1.11403	1.02103
Percentage Variance	28.40000	16.30000	13.90000	12.80000
Cumulative Variation	28.4	44.7	58.6	71.4

Factor 1 explains 28.4% variance. It has high positive loadings on Making Team Effort and Seeking External Effort and moderate positive loading on Making Self Effort. It has high negative loading on Defending the Self and moderate negative loadings on Fatalistic Thinking and Wishful Thinking.

Factor 2 explains 16.3% variance. It has high positive loadings on Blaming the External Agency and Fatalistic Thinking and high negative loading on Defending the Self.

Factor 3 explains 13.9% variance. It has high positive loading on Blaming the Self and moderate negative loading on Fatalistic Thinking.

Factor 4 explains 12.8% variance. It has high positive loadings on Wishful Thinking and Making Self Effort. It has moderate negative loadings on Defending the Self and Fatalistic Thinking.

DISCUSSIONS

Rank Order of Problem Management Styles: Defending the Self being the dominant problem management style indicates that in the normal circumstances, problems in the organization , where the study was done, are generally being denied or rationalized. Making Self Effort being the backup problem management style indicates that while under pressure, solutions for problems are being attempted through self-effort by the organizational members. Teamwork is particularly weak in the organization (being ranked 7). These findings were also confirmed in discussions with the respondents. A similar finding on dominant—backup coping strategy, viz., *Defensive—Intropersistive* has been reported by Sen (1981) for public sector banks. Srivastav (2006) studied coping strategy across management levels for the same organization and found the dominant—backup coping strategy as Defensive—Intropersistive across junior, middle and senior management levels. Srivastav (2007) also studied coping strategy across R&D, production, quality and miscellaneous functions for the same organization and found the dominant—backup coping strategy as Intropersistive—Defensive for R&D but Defensive—Intropersistive for production, quality and miscellaneous functions.

Inter-correlation of Problem Management Styles: When we deny the very existence of the problem or see a benefit from the problem, there is no need to blame others for the creation of the problem. Similarly, when we hold others responsible for the problem, the problem no more poses a threat for the self. This explains the negative correlation between Blaming the External Agency and Defending the Self. Negative correlation between Extrapunitive and Defensive strategies has also been reported by Sehgal (1997).

When we believe that problems are unavoidable and unsolvable, we are pessimistic and do not look or try for their solutions. This explains the negative correlation of Fatalistic Thinking with Wishful Thinking, Making Self Effort, Seeking External Effort and Making Team Effort. Negative correlation of Impunitive strategy with Impersistive, Intropersistive, Extrapersistive and Interpersistive strategies has been reported by Sehgal (1997).

When we are not optimistic about solutions for the problems, the problems may appear to be threatening and we may resort to defensive behavior in the form of denial or rationalization of the problems to protect ourselves from the perceived threats. Under the circumstances, we may not feel the need to look or try for their solutions. This explains the negative correlation of Defending the Self with Wishful Thinking, Making Self Effort, Seeking External Effort and Making Team Effort. Negative correlation of Defensive strategy with Intropersistive, Extrapersistive and Interpersistive strategies has been reported by Sehgal (1997).

When we believe that a problem has arisen due to one's own wrongdoing or lack of competence, we do not have the confidence to face the problem and try for its solution. This explains the negative correlation of Blaming the Self with Making Self Effort and Seeking External Effort. Negative correlation of Intropunitive strategy with Defensive, Intropersistive, Extrapersistive and Interpersistive strategies has been reported by Sehgal (1997).

When we are holding others responsible for the problems, we may not feel the need to solve the problem. Thus we do not take the initiative to solve the problem with our own effort or with others' effort. This explains the negative correlation of Blaming the External Agency with Making Self Effort and Seeking External Effort. Negative correlation of Extrapunitive strategy with Defensive, Impersistive, Intropersistive, Extrapersistive and Interpersistive strategies has been reported by Sehgal (1997).

When we have an optimistic disposition, we have a lesser fear of failure and our self-efficacy becomes stronger, motivating us to take the initiative to perform. This explains the positive correlation between Wishful Thinking and Making Self Effort.

As we start putting in more and more self-effort for solving the problems, we have a greater realization that we do not have the required competence for solving all the problems with our own efforts and we start seeking help from those who have complementary competencies. This explains the positive correlation between Making Self Effort and Seeking External Effort. Positive correlation of Intropersistive strategy with Extrapersistive and Interpersistive strategies has been reported by Sehgal (1997).

As we start seeking more and more external efforts, we start appreciating our interdependencies with others. We get more sensitized to the complementary competencies of the self vis-à-vis others and vice versa. This enables the reinforcement of teamwork and explains the positive correlation between Seeking External Effort and Making Team Effort. Positive correlation between Extrapersistive and Interpersistive has been reported by Sehgal (1997).

Factor Analysis of Problem Management Styles: Factor 1 represents facing or confronting the problems, trying to find their solution through (i) self-effort; (ii) external effort; (iii) team effort. It de-emphasizes inaction in different forms: (a) denying or rationalizing problems; (b) treating the problems as unavoidable and unsolvable; (c) believing that time or changed circumstances in future will solve the problems without making any effort, whatsoever. De-emphasizing inaction as mentioned above further reinforces confrontation with the problems. Factor 1 can rightly be named as Confrontation Strategy.

Factor 2 reflects blaming external factors for the problems, accepting them as they are and not taking any action to solve the problems, believing them to be unavoidable and unsolvable. It de-emphasizes denial and rationalization of problems which re-enforces the acceptance of problems. There is no need to be defensive because of emphasis on blaming others. Factor 2 is therefore named as Externalized Blaming Strategy.

Factor 3 emphasizes aggression directed towards the self and de-emphasizes accepting the problems as natural and unavoidable. There is a main emphasis on the self as the source of the problem, believing that problem would not have been there but for the self-deficiencies or wrongdoings by the self. De-emphasizing fatalistic attitude further re-enforces self-blaming. Factor 3 can rightly be called as Self-Blaming Strategy.

Factor 4 represents optimism and hope that problems would eventually be solved and by independently making self-effort for solving the problems. It reflects self-confidence to find solution for all the problems all by oneself. It de-emphasizes denying or rationalizing problems and fatalistic attitude which re-enforce the belief that problems can always be solved just by independent self-efforts. This style is typical of the Spanish character—Don Quixote (Miguel de Cervantes, 2004) who believed in his heroic destiny, imagining himself to be so powerful that he could accomplish anything all by himself. Factor 4 is therefore named as Don Quixote Strategy.

Evidence and predominance of these meta-strategies (represented by the above mentioned factors) in the organization under study was confirmed in personal discussion with the respondents. In another study, conducted in a bank, involving 500 respondents, another four meta-strategies, viz., Defensive Externalization, Problem Solving, Dependent Persistence, and Collaborative Internalization have been reported by Sen (1981).

CONCLUSIONS AND RECOMMENDATION

Dominant—backup coping strategy combination reflects the nature of the organization; it may be different for various groups within the same organization. In the organization undertaken for this study, organizational members generally adopt dysfunctional strategies for managing their organizational problems in normal circumstances, but they become functional while under pressure. In such a situation, pressure needs to be applied on organizational members for enhancing their individual and organizational performance.

One correlation (negative) has been found among the dysfunctional problem management styles. There are 12 correlations (negative) between the dysfunctional and functional problem management styles. Three correlations (positive) are found among the functional problem management styles.

Meta-strategies for coping with stress (or for managing problems) reflect and depend on some of the characteristics of the organization. In the organization undertaken for this study, problems are managed in four ways (by adopting four meta-styles or combination of different basic styles), viz., Confrontation, Externalized Blaming, Self-Blaming, and Don Quixote Strategies, as explained above.

Further research needs to be done on the determinants of coping strategy, so as to emphasize functional coping and de-emphasize dysfunctional coping to maximize organizational effectiveness.

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ANNEXURE

Role-PICS Questionnaire
(Simplified by Omitting Pictures)

S.No.	Question	Asked by
1.	So they load you with so much more work!	A colleague
2.	It's too much that my boss and my subordinates opposite expectations from me.	A colleague
3.	It's a pity you did not have an opportunity to prepare role you are likely to take in the organization.	A colleague
4.	You are so lonely in the organization.	The spouse
5.	I cannot use my talents and skills in my job.	The boss
6.	I just don't get enough time to spend with my family and friends.	A colleague
7.	You do not get enough resources to do a good work on your job.	A colleague
8.	They have taken away some important functions from your role, those to other roles.	A colleague
9.	Too many people expect too much from me.	A subordinate
10.	It is not clear what I am supposed to do on my job.	A subordinate
11.	Enough attention should have been given to help me get into the more effectively.	A subordinate
12.	I just don't have an opportunity to interact with other roles.	A colleague
13.	I wish your job would help you to use your special training.	A colleague
14.	Your family is disappointed and feels deprived of your attention busy job.	A colleague
15.	I wish I had a higher level of expertise on this job.	A subordinate
16.	I would like to work on many more functions than are contained in my job.	A subordinate
17.	I know you are already over—burdened, but I am afraid you will have to do this assignment also.	The boss
18.	You are not clear about the requirements of your job.	A colleague
19.	You are not yet ready to take higher responsibilities.	The boss
20.	You do not have close relations with other roles in the organization.	The boss

(Contd...)

ANNEXURE

Role-PICS Questionnaire
(Simplified by Omitting Pictures) *(Contd...)*

S.No.	Question	Asked by
21.	You do not use your main talents in your role.	The boss
22.	You are too busy with your work and you do not have enough time for us.	The spouse
23.	You do not have the necessary technical knowledge and experience for the job.	A colleague
24.	I am afraid the specific function you wanted to perform has to be given to some other role.	The boss

Source: Pareek U, Training Instruments in HRD and OD, *2nd Edition, Tata McGraw-Hill Publishing Company Limited, New Delhi, 2004, pp. 620-624.*

How Efficient is Cash Management? An Investigation into Indian Commercial Vehicles Industry

P Janaki Ramudu and S Durga Rao***

The present study is undertaken to analyze the effectiveness of cash management in select companies of the Indian Commercial Vehicles Industry. The cross sectional analysis indicates that the efficiency of cash management varied widely among sample companies. The results and discussion warrant greater care to be exercised in cash management. The application of regression analysis reveal that the cash balance hardly depended and varied along with any independent variables like current liabilities, current assets and sales in Swaraj Mazda Ltd., and in case of other sample companies, it depended and varied mostly along with current liabilities and current assets. Thus, the study reveals that sales volumes seldom influence the cash balance.

INTRODUCTION

The term 'cash' is used in two senses. In a narrower sense, it includes coins, currency notes, cheques, bank drafts and demand deposits held by the firm in banks. In a broader sense, it also includes near cash assets such as the marketable securities and time deposits with banks. For the purpose of our discussion, we shall follow the broader sense. Cash is the most vital resource in any business. The management of cash resource is peculiar from that of other resources since it is invested in the rest of the resources. As Kennedy and McMullen (1958) pointed out, the inadequacy or mismanagement of any component of the working capital is the leading cause of the business failure. Thus, the success or failure of any business does not depend on the mere availability or non-availability of cash but, on its effective management. As Howard and Upton (1953) put it, "The effective control of cash is one of the most important requirements of a successful financial management. Cash is the lifeblood of any business enterprise and its steady and healthy circulation throughout the business operations has been shown repeatedly to be the basis of business solvency."

The concept of motives for holding the cash dates back to the framework of Keynes (1935) General Theory. The prominent motives of holding cash resource are—transaction motive, precautionary motive, speculative motive and compensatory motive. The prime

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objectives of cash management are to meet the cash disbursement needs as per the payment schedule and to minimize the amount of funds locked up as cash balances. The best way to achieve these objectives is the skillful cash management. Discussing the importance of cash management, Yair E Orgler (1970) expressed that the need for cash and its effective management arises due to the fact that there is a lack of synchronization between the cash inflows and outflows. The researchers organized the paper in the order of review of literature, an overview of Indian Commercial Vehicles Industry, objectives and hypothesis of the study, methodology of the study, results and discussions and nontechnical summary.

REVIEW OF LITERATURE

Review of literature is a process of developing an insight into both the conceptual and research based studies available on the area and the topic chosen. The objective of such a review is to understand the importance of the topic and find out the research gaps if any in the chosen area. The review in the present study largely consists of research, based on the published work available in India as well as abroad. The organization of the review was done in a chronological order. Though there were innumerable studies available on the cash management, the researchers discussed the most important studies on a choice basis. A deeper look into the literature survey indicates that there was no specific research on cash management in the commercial vehicles industry either in India or abroad. The following are some of the research studies reviewed which highlight the importance of cash management and recommend the dire need for research in cash management.

Mishra R K (1975) in his study among the six public sector units in India, found out that there were fundamentally four basic problem areas concerned with cash, debtors, inventory and financing of working capital in the sample companies. It was due to these chronic problems that the sample companies failed miserably in achieving the effective management of the working capital. The study addressed the dire need for an efficient and an effective usage of funds and cash management in order to enhance the profitability of the companies.

Probing into the current practices of the working capital management in crane manufacture industry in India, S P Gosh (1983) found out that the management of the individual components of the working capital was erratic. The collection mechanism followed by the sample companies was much unplanned and the companies took more time than allowed in collecting the cash from the customers. The study also revealed that the payments to the suppliers were equally delayed keeping the highest portion of payables pending for more than the allowed period. The study recommended the immediate need for streamlining the working capital management practices in general and cash management in particular.

Expressing their experience and survey based opinions in their research paper, Romero and Richard (1995), felt that the investment in the working capital has to be capitalized. They said that the goals of investment in the working capital were threefold: to find the income producing opportunities for the cash that is temporarily idle, to maximize yields and to maintain the liquidity of the investments. With his experience as an associate financial consultant with Merrill Lynch's Private Client Group in Arlington, Mr. Romero felt that the firms have to have a concrete formula of optimum investment of cash resource in the working capital.

In their article, Rafuse and Maynard E (1996) proposed that, enhancing the working capital by halting the payment to creditors was an effective strategy. The article revealed that the apparent intention of many UK companies was to defer payments as long as possible, well beyond the agreed arrangements. Very astonishingly, a report issued in 1994 by the Forum for Private Business (FPB), a UK small-business trade association, stated that on an average, the debtors accounts were paid more than 50 days beyond the agreed due date. The research also stressed the need for a lean value system. Close supplier-customer relationship was found to be the core characteristic feature of such a value system. The survey warranted the firms to reduce the blockage of the cash resource in inventories immediately, in order to maximize the profits of the firms. The survey also revealed that the responsibility of effective cash management rests with the finance manager.

Jain (1988), in his study among ten manufacturing, trading and service industries in the state of Rajasthan in India, brought out various working capital management practices followed by the select companies. The study found out that the companies had both over investment and under investment problems. The study strongly recommended for the release of excess funds in the working capital and to invest the same in short-term or long-term assets. The study also revealed that the percentage of cash and near cash items, as against current liabilities, current assets and sales, was highly erratic during the study period in the sample companies. Thus, the study recommended the dire need for streamlining the cash management practices if they wanted better profit margins.

Vijaya Kumar, (1998) in his study among cooperatives and private sector companies in the sugar industry of Tamil Nadu in India, found that the cooperative companies had a higher portion of cash and cash equivalents as a percentage of the total current assets than that of the private sector companies which affected the liquidity position. He also found that the variations in the cash levels of the cooperative sector companies were much higher than that of the private sector companies. The study recommended for immediate streamlining of cash management if the firms wanted a balanced liquidity.

Conducting a research on the working capital management at Escorts, Mohd. Aamir Khan (1999), found that cash management at various divisions of the sample company was ineffective and the company was not clear in cash planning. This in turn resulted in liquidity crunch and lower profitability of the company despite better net cash inflows out of the operating activities. The study further revealed that the firm relied more on bank borrowings and hence, recommended that there was a dire need to pay attention to the cash management.

Writing an essay on the merchandising ratio, Cote and Latham (1999), identified that mismanagement of cash could thrust the firm into financial distress even though currently, it may be a profitable one. Elaborating the concept, they revealed that WT Grant the largest retailer in the UK, miserably failed and closed the business despite being stronger than its competitors in terms of earnings position. The simple cause for such bankruptcy was its failure to manage cash conversion cycle effectively. Appropriately substantiated observations made by the authors reveal that the cash management could, at times, be the single factor, for the success or failure of the business.

Conducting a research survey on the working capital management practices in Canada, US and Australia, Nabil Khoury *et al.* (1999) found that 76% of the Canadian respondents and 40% of the Australian and US respondents used subjective judgment in transferring the funds between the cash and marketable securities while the rest of the sample firms used established guidelines. The survey revealed that, majority of the sample companies failed to draw any guidelines and policies with respect to cash management and hence, suffered severely from liquidity crunch.

While conducting a survey on the International working capital practices in the UK, Ricci and Vito (2000) found that majority of the respondents (68%) used wire transfers as the most common mode of cash management operations whereas 7.2% of the respondents never used it at all. The study is indicative of the importance of cash management suggesting innovative methods of cash planning and control.

A study conducted by Dev Strischek (2001) revealed that, majority of the bankers took cash management into account as the prime factor while evaluating the effectiveness of working capital management. The study also revealed that most of the bankers meant by working capital management, as more cash flow to repay bankers and more value to investors. The study clearly indicates that cash management of the company is of paramount importance to the bankers in their lending decisions.

Conducting a study on the working capital management of horticulture industry in Himachal Pradesh, Joginder (2001), attempted to assess the effectiveness of the cash management through cash to current assets ratio, cash to sales ratio and cash to current liabilities ratio. It was found that on an aggregate basis, the firm had the largest portion of the cash with reference to its current assets with higher variations. Further analysis of the study also revealed that there was a poor planning and control of the cash resource. The study recommended for the reduction of the cash balances with reference to the various variables as identified in the study.

A study conducted by Sivaram Prasad (2001) in the Indian paper industry revealed that, cash management formed the central part of the total working capital management. It was found out that majority of the sample companies preferred centralized cash management system in order to ensure effective cash management. But for Ballapur Industries Ltd., all other sample companies miserably failed to articulate and lay down clear policies and procedures with respect to the cash management.

As a strategy to fight back, Merrill Lynch's, (2001) the Bank Rhode Island launched business max, a checking account tied to a money market yielding 6% for the accounts with balances of at least US$50,000. These competitive strategies adopted by the major bankers, highlight the importance of the optimum use of the cash resource. The article emphasized indirectly that effective management of the working capital depends on the proper utilization of cash resource.

In a survey conducted at Noveon (2002) a chemical based company in the US, it was found that the prudent working capital management resulted in an increase in the cash inflows. The increase in cash inflows due to improved working capital management was almost double which indicates the tangible benefits of effective working capital management. Thus, the researchers inferred that, cash management was of paramount importance in short-term financial management.

Sudarsanareddy (2003) in his attempt to assess the financial performance of the paper industry in Andhra Pradesh, found out that the cash and bank balance to the current assets as percentage was inadequately maintained in the two mills, which was far below the standard norm of 5-10%. The abnormal high turnover of cash in majority of the sample units was an indication of overtrading. However, the study revealed that, on an overall basis, the cash management lacked an effective planning and control in the sample companies.

Nazli Kibria Susan Lee and Ramona Olvera (2003), went very innovative on the working capital management. They conducted face to face interactions and discussions among the members of the peer-lending group: a system in which small groups of unrelated individuals work to support and enforce loan giving and repayment. The analysis draws on a case study of the working capital. They helped the members of the above said group in meeting short-term fund requirements for their small and diversified businesses. The panel discussions revealed that effective cash management is crucial if the firms wanted to optimize their working capital management.

According to the Book of Numbers research findings from the Hackett Group, the largest global companies tied up more than US$1 tn cash resource in the working capital. However, a few companies were found to be effective in cash management and could reduce the cost of investment in the working capital which eventually increased the profit margin. The research revealed that most of the companies could have increased the profits by up to 11% through a proper cash management. Based on these findings, the members of Hackett executive advisory program, recommended an immediate action to streamline the cash management.

In the Cash Management Score Card prepared by REL Consultancy group for *CFO Europe magazine*, it was found that cash balance as against the sales was at the two extremes leading to a cash crunch and cash surplus. The score card also revealed that cash per sales of majority of the companies were showing huge variations affecting the liquidity position.

The research identified the need for a continual review of cash management with reference to important variables like current assets, current liabilities and sales.

AN OVERVIEW OF INDIAN COMMERCIAL VEHICLES INDUSTRY

Commercial Vehicles (hereafter CVs) sector comprises buses and trucks which are classified into Light Commercial Vehicles (LCVs), Medium and Heavy Duty Vehicles (M&HDVs) and Heavy Duty Vehicles (HDVs). Commercial vehicles segment is the lifeline of the Indian economy followed by the Indian railways in transporting the goods and the passengers. Though the CVs segment only supplements railways in the mass transportation, road transportation scores over railways in terms of both freight and passenger and results in cost trade off. With economic liberalization in the 1990s, the economy witnessed a sudden spurt in the overall growth in general, and of the industrial sector in particular. This trend was sustained till 1996 with increasing doses of liberalization, fuelling growth. It had its impact on the commercial vehicles industry as well. By the end of 1995-96, the CVs industry had returned a Compounded Annual Growth Rate (CAGR) of 12.4%, mainly through high growth recorded by trucks (9.3%) and a staggering 17.5% by the LCV segment. Howsoever small in size, India, by volume, is the fifth largest market for M&HDVs. In value terms, the market is mainly for the cheaper and low tonnage vehicles. The bigger segment of the HDVs is characterized by the 12 to 16 tonne vehicles. Developed countries moved into a substantially higher capacity vehicles. With improved conditions of roads, commercial vehicles with a capacity of 35 tonnes and above are finding their presence in India as well. Germany, France and the UK are among the few countries in the world producing buses with modular chassis. In India, through it's offering at the Indian Auto Expo in January 2000, Tata Motors also developed a 'Concept Bus'.

THE NEED AND OBJECTIVES OF THE STUDY

Despite the fact that the cash is a nonliving resource, the importance of its management cannot be overemphasized. As it was highlighted in the review of research, cash management is of prime importance in the economic success of any business unit. The literature survey reveals that the Indian Commercial Vehicles Industry has been the most neglected sector in terms of research on cash management, despite it being a capital intensive industry. Thus, having found the gap, the researchers felt that Indian Commercial Vehicles Industry is the most appropriate one to focus attention on in carrying out the research on cash management. The present study, thus, attempts to analyze the effectiveness of cash management and make a comparative analysis among the sample companies and thereby suggest the most suitable cash predicting model.

HYPOTHESES OF THE STUDY

The present study tests the following hypotheses.

Ho_1*: *There is no significant difference among the cash ratios of the sample companies.

Ho_2*: *There is no significant difference among the ratios of cash to current assets of the sample companies.

Ho_3*: *There is no significant difference among the ratios of cash to sales of the sample companies.

Ho_4*: *There is no significant difference among the cash turnover ratios of the sample companies.

Ho_5*: *There is no significant difference among the cash conversion cycles of the sample companies.

METHODOLOGY OF THE STUDY

The study is conducted among five commercial vehicle companies representing the Indian Commercial Vehicles Industry. The companies taken for the study are Tata Motors Ltd., (hereafter TML), Ashok Leyland Ltd., (hereafter ALL), Bajaj Tempo Ltd., (hereafter BTL (now Force Motors Ltd.)), Eicher Motors Ltd., (hereafter EML) and Swaraj Mazda Ltd., (hereafter SML). The data of ten years, from 1995 to 2004, required for the analysis part have been collected through online database "http://www.asiancerc.com".

VARIABLES USED IN THE STUDY

The effectiveness of the cash management could be understood in terms of the comparison between the cash balance and the business performance indicators like the size of current assets and sales. The time taken by the business unit to convert credit sales into cash is also an important parameter of measuring the cash management. The cash generated by the business through the three major activities called operating activities, financing activities and investing activities would help in assessing the effectiveness of the cash management. Thus the effectiveness of cash management of the sample companies in the present study has been assessed through the following variables:

- Cash ratio,
- Ratio of cash to current assets,
- Ratio of cash to sales,
- Cash turnover ratio,
- Cash conversion cycle, and
- Cash flow statement.

RESULTS AND DISCUSSIONS

The analysis and interpretation part of the study is carried on in the sequence of the variables mentioned above. Apart from the percentage method and growth rates, the researchers used Karl Pearson's Coefficient of correlation, coefficient of determination, student's 't' test of significance and Durbin Watson's coefficient while interpreting the results. As Prasanna Chandra (2004) rightly put it, while interpreting and judging the performance of the sample companies, the researchers used cross sectional analysis and step-wise multiple regression analysis in order to detect secular changes and avoid the bias introduced by transitory forces. The following are the results and discussions.

Cash Ratio

Cash ratio indicates the most stringent liquidity position of the business. As Stephen A Ross *et al.* (1999) observed, this ratio reveals the number of times cash held by the company for every rupee of current liabilities. Higher the ratio, more confident would be the creditors on the company's ability to repay. According to Business

Resource Software Inc., a ratio below 0.5 may mean the company is having cash flow problems, possibly because of a significant backlog in the receivable accounts.

The cash ratio position of Indian Commercial Vehicles Industry is presented in Table 1. The mean cash ratio across the sample companies varied between 0.04 times in 1996 and 0.13 times in 2004 and the overall mean ratio was 0.10 times. The data in Table 1 reveals that, of all the companies, Ashok Leyland Ltd., was able to maintain an average of 0.18 times cash of current liabilities. On the other hand Bajaj Tempo Ltd., had an average of 0.05 times of cash to current liabilities being the lowest among all the sample companies. Further observation into Table 1, reveals that all the companies across the industry failed to maintain a suggested ratio of 0.5 times during the study period.

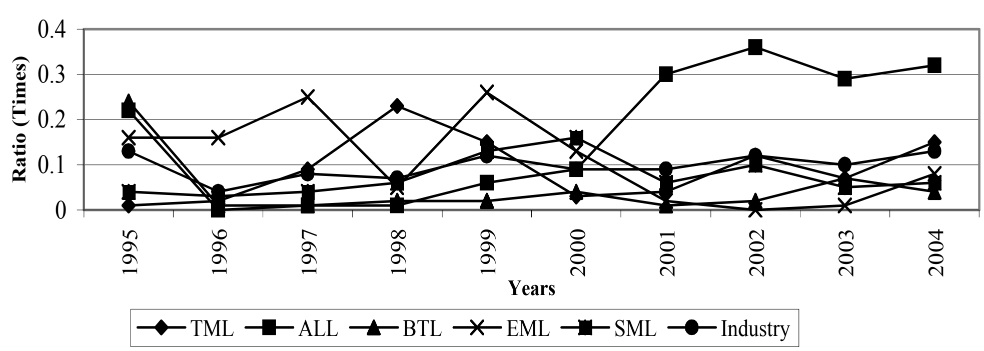
As it is shown in Figure 1, but for Ashok Leyland Ltd., the cash ratio of the sample companies moved together during the study period, in line with the

Table 1: Cash Ratio (in Times) of Sample Companies

Years	TML	ALL	BTL	EML	SML	Mean
1995	0.01	0.22	0.24	0.16	0.04	0.13
1996	0.02	0.00	0.01	0.16	0.03	0.04
1997	0.09	0.01	0.01	0.25	0.04	0.08
1998	0.23	0.01	0.02	0.05	0.06	0.07
1999	0.15	0.06	0.02	0.26	0.13	0.12
2000	0.03	0.09	0.04	0.13	0.16	0.09
2001	0.04	0.30	0.01	0.02	0.06	0.09
2002	0.12	0.36	0.02	0.00	0.10	0.12
2003	0.07	0.29	0.07	0.01	0.05	0.10
2004	0.15	0.32	0.04	0.08	0.06	0.13
Mean	0.09	0.18	0.05	0.11	0.07	0.10

Source: www.asiancerc.com

Figure 1: Cash Ratio (inTimes) of Sample Companies



industry average. The cash ratio of Ashok Leyland Ltd., was on the higher side particularly during the period from 2000 to 2004 revealing the higher cash balances being held as against the current liabilities.

One-way ANOVA results pertaining to the cash ratios of the sample companies are depicted in Table 2. As the F_{cal} (1.50) is less than F_{crit} (2.58) for 8 degrees of freedom at 5% significance level, we accept Ho_1 and conclude that there is no significant difference in the cash ratios of the sample companies.

Table 2: One-way Anova Results for the Cash Ratios of the Sample Companies

Source of Variation	SS	df	MS	F_{cal}	P-value	F_{crit}
Between Groups	511.28	4	127.82	1.50	0.22	2.58
Within Groups	3,837.750	45	85.28			
Total	**4,349.03**	**49**				

Legend:

SS = Sum of Squares; df = Degree of Freedom; MS = Mean Square;

F_{cal} = Calculated Value of 'F'; P-value = Probability Value of 'F';

F_{crit} = Table Value of 'F' at eight degrees of freedom and 5% significance level.

Source: One-way ANOVA was Performed Using MS-Excel Software After Suitable Transformation of the Data.

Ratio of Cash to Current Assets

Ratio of cash to current assets indicates the percentage of cash and bank balances as against the current assets of the company. Ratio of cash to sales is an indicator of the company's efficiency in controlling the cash. As Agarwal N K (1983) observed it, a downward trend in this ratio over a period of time would mean better control of cash whereas, an upward trend would imply slack in the control over the cash resource. According to Guthmann and Dougall, (1955) a comfortable business will not run less than 5-10% of cash to current assets. However, Hrishikesh Bhattacharya (2003) observed that the companies in India, from a normative angle, couldn't have more than 1.5-2% of cash to current assets. The position of ratio of cash to current assets of the sample companies is as follows.

The data in Table 3 reveals that, this ratio varied between 3.10% in 1996 and 11.87% in 2004 across the industry. Of all the sample companies, Bajaj Tempo Ltd., held the highest percentage (23.61) of cash to current assets in 1995, followed by Ashok Leyland Ltd., (22.20) and Tata Motors Ltd., (20.09) in 2004. On an overall basis, Ashok Leyland Ltd., held the highest ten year average (8.16%) cash to the current assets followed by Tata Motors Ltd., and Eicher Motors Ltd., which held 7.33% equally as against the industry average of 6.53%. A comparison of the ratios with the norms of 5-10% as suggested by Guthmann and Dougall, it is found that all the sample companies were comfortable in maintaining the cash balance to meet the current assets requirements. Further comparison with that of the normative norms of 1.5-2%, as suggested by Hrishikesh Bhattacharya, all sample companies were well above the comfort zone in maintaining the cash balances to fund the current assets requirements. Figure 2 indicates that, the ratio formed an increasing pattern during the study period. The figure also reveals that the ratio of cash to current assets of Ashok Leyland Ltd., was slightly on the higher side during 2001 and 2004, which indicates that the firm held more cash balance as against current assets when compared to other sample companies.

The results of one-way ANOVA pertaining to the ratio of cash to current assets of sample companies are presented in Table 4. As F_{cal}. (1.52) is less than F_{crit} (2.58) for 8 degrees of freedom at 5%

Table 3: Ratio of Cash to Current Assets (Percentage) of Sample Companies

Years	TML	ALL	BTL	EML	SML	Mean
1995	0.74	6.76	23.61	9.65	3.47	8.85
1996	1.51	0.15	1.49	10.36	1.98	3.10
1997	4.42	0.33	1.46	13.45	2.84	4.50
1998	10.66	0.13	1.54	3.05	3.82	3.84
1999	9.99	4.35	1.79	16.64	7.91	7.67
2000	2.16	2.57	4.12	9.03	11.07	5.79
2001	4.17	10.86	1.13	1.65	4.15	4.39
2002	11.45	17.68	2.25	0.57	6.87	7.76
2003	8.11	16.56	5.69	0.79	4.11	7.05
2004	20.09	22.20	4.15	8.15	4.74	11.87
Mean	7.33	8.16	4.72	7.33	5.09	6.53

Source: Computed from the data available in http://www.asiancerc.com

Figure 2: Ratio of Cash to Current Assets (Percentage) of Sample Companies

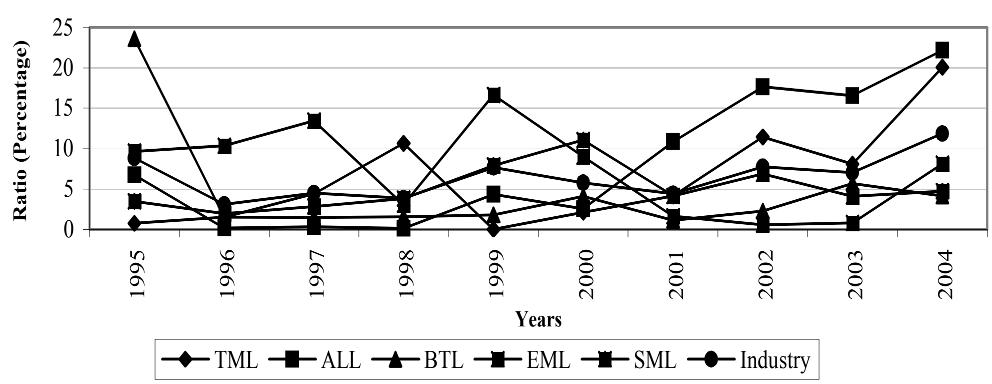


Table 4: One-way ANOVA Results for the Ratios of Cash to Current Assets of the Sample Companies

Source of Variation	SS	df	MS	F_{cal}	P-value	F_{crit}
Between Groups	381.85	4.00	95.46	1.52	0.21	2.58
Within Groups	2819.90	45.00	62.66	–	–	–
Total	**3201.75**	**49.00**	–	–	–	–

Legend:

SS = Sum of Squares; df = Degree of Freedom; MS = Mean Square;

F_{cal} = Calculated Value of 'F'; P-value = Probability Value of 'F';

F_{crit} = Table Value of 'F' at eight degrees of freedom and 5% significance level.

Source: One-way ANOVA was Performed Using MS-Excel Software After Transformation of the Data.

significance level, we accept Ho_2 and conclude that there is no significant difference in the ratios of cash to current assets of the sample companies.

Ratio of Cash to Sales

Ratio of cash to sales is a significant proportion indicating the efficiency of the firm in achieving higher sales with lower cash balance or otherwise. Sagan and John (1995) observed that the lower the percentage of cash to sales, the more efficient is the cash management and vice-versa. However, the general rule is that, as sales increase, cash also increases but at a decreasing rate (Walker E W, 1974). Thus, comparison between the growth rate of sales and cash would throw light on, how effective is the company in cash management.

The ratio of cash to sales of the sample companies is presented in Table 5. On an aggregate basis, the cash balance as the percentage of sales in Indian commercial vehicle industry was the highest at 2.66% in 2004 and the lowest at 0.18% in 1996. As it is depicted in Table 5, of all the companies, Bajaj Tempo Ltd., Eicher Motors Ltd., and Swaraj Mazda Ltd., had very negligible cash balances as the percentage of their sales during the entire period of study and thus were able to achieve higher sales with lower cash balance. Tata Motors Ltd., and Eicher Motors Ltd., on the other hand, had slightly more cash balances as the percentage of sales than the yearly industry average during the study period. On an overall basis, Bajaj Tempo Ltd., Eicher Motors Ltd., and Swaraj Mazda Ltd., maintained the cash balances as percentage of sales by 0.02, 0.03 and 0.03 respectively which were much below the overall industry aggregate of 1.45%. Ashok Leyland Ltd., and Tata Motors Ltd., on the other hand, maintained a slightly more cash balance as percentage of sales by 4.28% and 2.89% than the overall industry aggregate of 1.45%. Thus, the commercial vehicles industry as a whole was able to achieve higher sales with the lower cash balance. Table 5 reveals that the ratio of cash to sales of Tata Motors Ltd., and Ashok Leyland Ltd., were on the higher side from 1997 to 1999 and from 2001 to 2004 respectively, implying that,

Table 5: Ratio of Cash to Sales (Percentage) of Sample Companies						
Years	**TML**	**ALL**	**BTL**	**EML**	**SML**	**Mean**
1995	0.33	5.52	0.12	0.04	1.73	1.55
1996	0.64	0.13	0.01	0.05	1.05	0.38
1997	2.11	0.26	0.01	0.05	1.77	0.84
1998	5.99	0.12	0.01	0.01	1.79	1.58
1999	6.70	3.03	0.01	0.06	5.03	2.97
2000	0.74	1.43	0.02	0.03	5.07	1.46
2001	1.43	6.33	0.00	0.00	2.17	1.99
2002	3.67	10.45	0.01	0.00	3.13	3.45
2003	2.26	7.22	0.02	0.00	1.61	2.22
2004	4.97	8.27	0.01	0.02	1.90	3.03
Mean	2.89	4.28	0.02	0.03	2.53	1.95
Source: Computed from the data available in http://www.asiancerc.com						

both these companies held higher cash balances as against sales when compared to other sample companies.

The results of one-way ANOVA pertaining to the ratio of cash to sales of sample companies are presented in Table 6. Since F_{cal}. (2.72) is greater than F_{crit}. (2.58) for 8 degrees of freedom at 5% significance level, we reject Ho_3 and conclude that there is a significant difference in the ratios of cash to sales of the sample companies.

Cash Turnover Ratio

The cash turnover ratio measures the velocity at which the cash moves through the business operations as reflected in the sales turnover. The objective of this ratio is to know the number of times the company turned its cash balance into sales. As it was researched and found out

Table 6: One-way ANOVA Results for the Ratios of Cash to Sales of the Sample Companies						
Source of Variation	**SS**	**df**	**MS**	F_{cal}	**P-value**	F_{crit}
Between Groups	135.28	4	33.82	2.72	0.04	2.58
Within Groups	559.02	45	12.42			
Total	**694.30**	**49**				

Legend:
SS = Sum of Squares; df = Degree of Freedom; MS = Mean Square;
F_{cal} = Calculated Value of 'F'; P-value = Probability Value of 'F';
F_{crit} = Table Value of 'F' at eight degrees of freedom and 5% significance level.

Source: One-way ANOVA was Performed Using MS-Excel Software After Transformation of the Data.

by Khandelwal N M (1985), if the business could turnover its cash resource larger number of times, it can finance greater volumes of sales with relatively lesser cash balance. This in turn would increase the profitability of the firm. Though there are no specific norms, higher ratio is always desirable for the company in order to maximize its profitability. The cash turnover position of sample companies is depicted in Table 7.

registered lower cash turnover ratio. Tata Motors Ltd., could achieve more cash turnover than the yearly industry average only in 1995 and 2000. On an aggregate basis, across the industry, Eicher Motors Ltd., the Swaraj Mazda Motors Ltd., and Ashok Leyland Ltd., were efficient by achieving cash turnover ratios of 219.65 times, 219.65 times and 49.84 times respectively as against the overall industry aggregate ratio of 169.95 times. On the other hand, Tata Motors Ltd. and Bajaj Tempo Ltd., were inefficient with the lower turnover ratios of 83.61 times and 112.1 times respectively.

Table 7: Cash Turnover Ratio of Indian Sample Companies

Years	TML	ALL	BTL	EML	SML	Mean
1995	304.47	18.1	8.69	22.72	57.91	82.38
1996	155.36	790.51	181.09	20.37	95.68	248.60
1997	47.43	380.76	168.16	18.30	56.51	134.23
1998	16.69	805.03	144.8	102.83	55.73	225.02
1999	14.93	33.00	117.18	16.97	19.88	40.39
2000	134.7	69.81	54.42	37.92	19.72	63.31
2001	69.96	15.81	204.27	300.74	46.11	127.38
2002	27.23	9.57	121.22	870.38	31.96	212.07
2003	44.18	13.85	42.5	759.09	62.26	184.38
2004	20.11	12.09	78.69	47.20	52.64	42.15
Mean	83.51	214.85	112.1	219.65	49.84	135.99

Source: Computed from the Data Available in http://www.asiancerc.com

The cash turnover across the commercial vehicles industry in India varied between the highest of 379.76 times in 2002 and the lowest of 39.81 times in 1999 with an aggregate ratio of 169.95 times. The data in Table 7 reveals that, of all the companies, Eicher Motors Ltd., and Swaraj Mazda Ltd., were able to achieve higher cash turnover than the yearly industry averages during the period from 2001 to 2004. The data also reveals that, Eicher Motors Ltd., was able to turnover its cash into sales by more number of times than the yearly industry average, during the first four years of the study period and in the rest of the years it

Table 7 indicates that the cash turnover ratios of Ashok Leyland Ltd., in 1996, 1997 and 1998 and Tata Motors Ltd., in 2002 and 2003 were abnormally higher than that of the other sample companies. It is also observed that, the cash turnover of all the other companies were highly consistent than that of these two companies. This implies that Tata Motors Ltd., and Ashok Leyland Ltd., comparatively achieved higher sales volumes with lower cash balance.

The results of one-way ANOVA pertaining to cash turnover position of the sample companies are presented in Table 8. Since F_{cal}. (10.24) is greater than F_{crit}. (2.58) for 8 degrees of freedom at 5% significance level, we reject Ho_4 and conclude that there is a significant difference in the cash turnover position of the sample companies.

Table 8: One-way ANOVA Results for Cash Turnover Ratio of Sample Companies

Source of Variation	SS	df	MS	F_{cal}	P-value	F_{crit}
Between Groups	161.37	4	40.34	10.24	5.53E-06	2.57
Within Groups	177.20	45	3.93			
Total	**338.57**	**49**				

Legend:
SS = Sum of Squares; df = Degree of Freedom; MS = Mean Square;
F_{cal} = Calculated Value of 'F'; P-value = Probability Value of 'F';
F_{crit} = Table Value of 'F' at eight degrees of freedom and 5% significance level.

Regression Results and Discussions

As stated earlier, the researchers used step-wise multiple regression analysis to study the individual effect of each independent variable (current liabilities, current assets and sales) and the combined effect of the various combinations of independent variables on the dependant variable (cash). The interaction effect between all the possible combinations of independent variables is analyzed through the development of all the possible regression models. Multiple 'R', coefficient of determination (R^2), adjusted 'R^2' , significance 'F', 't' statistic, standard error term and Durbin Watson's coefficient were used in analyzing the validity of the regression models. The following are the company wise regression results and discussions.

Table 9 contains the regression results of the dependent (cash) and independent variables (current liabilities, current assets and sales) of Tata Motors Ltd. The results reveal that of all the three independent variables, current liabilities showed the highest and significant effect on cash as proved by the multiple 'R' of 0.75, whereas, current assets and sales showed the slope of 0.5 and 0.64 respectively. The combinations of current liabilities and current assets ('R' value of 0.84) and current liabilities, current assets and sales ('R' value of 0.85) were found to be the most suitable combinations respectively. The 'R^2' values of these combinations (0.71 and 0.72) also reveal that these sets explain the highest percentage of relationship between cash and current liabilities, current assets and sales. However 't' statistic reveals that, the slopes of individual independent variables when joined together, are not significant enough in exerting their effect on the cash. The Durbin Watson's coefficients (2.47 and 2.61) for these two combinations also reveal that the error terms were the least when compared to that of other combinations. However the elimination process as indicated by 't' statistic reveals that it was only the current liabilities that could influence the size of the cash balance when compared to the current assets and sales.

Table 9: Step-wise Regression Results for All Possible Combinations of Dependant and Independent Variables of Tata Motors Ltd.

Linear Regression Model	Multiple R	Coefficient of Determination (R^2)	Adjusted R^2	Significance 'F'	't' Statistic(x_1, x_2, x_3)	Standard Error	Durbin Watson's Coefficient
$Y = -206.52 + 0.17x_1$	0.75	0.57	0.52	0.011*	$x_{1=0.012*}$	162.92	1.733
$Y = -249.68 + 0.15x_2$	0.50	0.25	0.157	0.14*	$x_{2=0.14**}$	214.86	1.013
$Y = -216.06 + 0.05x_3$	0.64	0.41	0.33	0.046*	$x_{30.046*}$	190.93	1.863
$Y = -564.68 + 0.16x_1 + 0.11x_2$	0.84	0.71	0.63	0.12**	$x_{1=0.01*}$ $x_{2=0.10**}$	142.03	2.476
$Y = -182.71 + 0.20x_1 - 0.01x_3$	0.76	0.57	0.45	0.051**	$x_{1=0.14**}$ $x_{3=0.82**}$	173.55	1.74
$Y = -559.78 + 0.12x_2 + 0.05x_3$	0.74	0.55	0.43	0.059**	$x_{2=0.17**}$ $x_{3=0.06**}$	177.30	2.084
$Y = -532.51 + 0.20x_1 + 0.12x_2 - 0.20x_3$	0.85	0.72	0.58	0.04*	$x_{1=0.10**}$ $x_{2=0.12**}$ $x_{3=0.66**}$	150.82	2.611

Legend:

Y = Cash, x_1 = Current Liabilities, x_2 = Current Assets, x_3 = Sales,

* Significant and ** is not significant at 5% significance level.

Source: Regression Test was Run Using SPSS Software.

As depicted in Table 10, in the case of Ashok Leyland Ltd., current liabilities and sales showed significant positive impact on the cash balance whereas, the current assets did not. However the cash balance depended more on current liabilities ('R' value of 0.82) than the sales ('R' value of 0.67). The interaction effect reveals that the slope between cash, as a true dependent variable, and current liabilities, current assets and sales as combined set of independent variables was the highest of 0.94 explaining 88% of the relationship. However, test of 't' statistic indicates that, the slope caused by sales as the independent variable was highly insignificant. Thus, the resulting two independent variables (current liabilities and current assets) resulted to be the most significant independent variables causing the significant change in the cash resource. This is also aptly proved by the multiple 'R' (0.94) and 'R^2' (0.88). Thus, though the 'F' ratio indicates that the three independent variable model is significant, 't' statistic reveals that the sales coefficient was the insignificant factor. It is also worth noting that the regression model with current liabilities and current assets as independent

Table 10: Step-wise Regression Results for All Possible Combinations of Dependant and Independent Variables of Ashok Leyland Ltd.

Linear Regression Model	Multiple R	Coefficient of Determination (R^2)	Adjusted R^2	Significance 'F'	't' Statistic(x_1, x_2, x_3)	Standard Error	Durbin Watson's Coefficient
$Y = -168.27 + 0.49x_1$	0.82	0.67	0.63	0.003*	$x_{1=0.003*}$	73.24	1.158
$Y = 511.63 - 0.25x_2$	0.45	0.21	0.11	0.18**	$x_{2=0.18**}$	113.65	0.729
$Y = -220.19 + 0.14x_3$	0.75	0.56	0.51	0.012*	$x_{3=0.012*}$	84.31	1.447
$Y = 224.90 + 0.49x_1 - 0.25x_2$	0.94	0.88	0.84	0.00*	$x_{1=0.00*}$ $x_{2=0.010*}$	47.82	1.701
$Y = -181.31 + 0.44x_1 + 0.02x_3$	30.82	0.67	0.58	0.02*	$x_{1=0.17**}$ $x_{3=0.85**}$	78.10	1.223
$Y = 135.83 - 0.22x2 + 0.13x_3$	0.85	0.72	0.64	0.011*	$x_{2=0.09**}$ $x_{3=0.00*}$	72.47	1.950
$Y = 245.65 + 0.54x_1 - 0.26x_2 - 0.02x_3$	0.94	0.88	0.82	0.00*	$x_{1=0.03*}$ $x_{2=0.02*}$ $x_{3=0.77**}$	51.26	1.544

Legend:
Y = Cash, x_1 = Current Liabilities, x_2 = Current Assets, x_3 = Sales,
* Significant and ** is not significant at 5% significance level.

Source: Regression Test was Run Using SPSS Software.

variables resulted in the lowest regression error term of 47.82 and Durbin Watson's coefficient of 1.701 indicating autocorrelation to a reasonable extent. Thus, of all the independent variables, current liabilities and the current assets caused the significant change in the cash resource.

Table 11 contains the regression results pertaining to Bajaj Tempo Ltd. As it could be noted in the table, the impact of all the independent variables like the current liabilities, current assets and sales separately on the cash balance was insignificant as tested by both 'F' ratio and 't' statistic. Even the combined effect of different sets of independent variables on cash was highly insignificant as tested by 'F' ratio. As we could observe, 't' statistic reveals that current liabilities alone had significant impact on the cash when it was combined with the current assets. Otherwise, cash balance did not respond to any of the independent variables either individually or in a combined way. The coefficient of determination (R^2) also indicates that, the maximum relationship explained was only 49% in case of fourth

Table 11: Step-wise Regression Results for All Possible Combinations of Dependant and Independent Variables of Bajaj Tempo Ltd.

Linear Regression Model	Multiple R	Coefficient of Determination (R^2)	Adjusted R^2	Significance 'F'	't' Statistic(x_1, x_2, x_3)	Standard Error	Durbin Watson's Coefficient
$Y = -5.7049 + 0.07x_1$	0.11	0.012	-0.11	0.76**	$x_{1=0.76^{**}}$	19.56	1.234
$Y = -5.70 + 0.07x_2$	0.11	0.01	-0.11	0.76**	$x_{2=0.76^{**}}$	19.56	1.234
$Y = 0.37 - 0.01x_3$	0.08	0.01	-0.12	0.80**	$x_{3=0.80^{**}}$	19.60	1.274
$Y = -42.06 + 0.76x_1 - 0.30x_2$	0.70	0.49	0.34	0.09	$x_{1=0.037^{*}}$ $x_{2=0.217^{**}}$	15.01	1.234
$Y = -30.34 + 0.28x_1 - 0.45x_3$	0.30	0.09	-0.17	0.72**	$x_{1=0.46^{**}}$ $x_{3=0.47^{**}}$	20.11	0.995
$Y = -30.34 + 0.28x_2 - 0.05x_3$	0.30	0.09	-0.17	0.72**	$x_{2=0.46^{**}}$ $x_{3=0.47^{**}}$	20.11	0.995
$Y = -30.34 + 0.00x1 + 0.28x_2 - 0.05x_3$	0.42	0.17	-0.24	0.74**	$x_{1=\infty}$ $x_{2=0.47^{**}}$ $x_{3=0.49^{**}}$	20.65	0.995

Legend:

Y = Cash, x_1 = Current Liabilities, x_2 = Current Assets, x_3 = Sales,

* Significant and ** is not significant at 5% significance level

Source: Regression Test was Run Using SPSS Software.

model consisting of the current liabilities and current assets as the independent variables. Thus, it is very difficult to suggest any regression model to predict the cash balance in case of Bajaj Tempo Ltd., as the 'F' ratio and 't' statistic reveal that no equation was statistically significant in explaining the relationship between the dependant variable (cash) and the independent variables (current liabilities, current assets and sales).

The regression results pertaining to Eicher Motors Ltd., are depicted in Table 12. When tested independently, it is found that, current liabilities and current assets, being the independent variables, caused a significant change in the cash balance as revealed by 't' statistic. 'F' ratio reveals that the interaction effect between any two and all the three independent variables combined caused significant change in cash resource. However 't' statistic reveals that the impact of current liabilities in the three independent variable model was highly insignificant and hence it could be dropped out. 'F' ratio and 't' statistic reveal that current liabilities and current

Table 12: Step-wise Regression Results for All Possible Combinations of Dependant and Independent Variables of Eicher Motors Ltd.

Linear Regression Model	Multiple R	Coefficient of Determination (R^2)	Adjusted R^2	Significance 'F'	't' statistic(x_1, x_2, x_3)	Standard Error	Durbin Watson's Coefficient
$Y = 2.6593 + 0.06x_1$	0.69	0.48	0.41	0.026*	0.026*	7.64	1.422
$Y = -1.12 + 0.08 x_2$	0.83	0.69	0.65	0.00*	0.00*	5.92	1.389
$Y = 0.62 + 0.01x_3$	0.62	0.38	0.30	0.056**	0.056**	8.32	1.491
$Y = -5.88 - 0.17x1 + 0.27x_2$	0.95	0.90	0.87	0.00*	$x_{1=0.006*}$ $x_{2=0.001*}$	3.62	2.804
$Y = 6.34 + 0.30x_1 - 0.06x_3$	0.81	0.65	0.55	0.025*	$x_{1=0.05*}$ $x_{3=0.10**}$	6.69	1.958
$Y = -2.34 + 0.22x_2 - 0.0x_3$	0.95	0.91	0.89	0.00*	$x_{2=0.00*}$ $x_{3=0.00*}$	3.3	2.701
$Y= 0 + 0.04 x_1 + 0.19x_2 - 0.04x_3$	0.95	0.90	0.73	0.00*	$x_{1=0.57**}$ $x_{2=0.001*}$ $x_{3=0.036}$	3.59	2.768

Legend:
Y = Cash, x_1 = Current Liabilities, x_2 = Current Assets, x_3 = Sales,
* Significant and ** is not significant at 5% significance level.

Source: Regression Test was Run Using SPSS Software.

assets, current assets and sales, as two separate sets of independent variables, had exercised significant change on cash. But the researchers recommend the model consisting of the current liabilities (multiple 'R' of 0.95) and current assets (multiple 'R' of 0.92) with the regression error term of 3.62. The Durbin Watson's coefficient (2.804) also reveals that there was high auto correlation among these variables.

The regression results pertaining to Swaraj Mazda Ltd., are summarized in Table 13. As revealed by the 'F' ratio, the model with current liabilities and sales as independent variables alone was significant enough, with 'R' value of 0.78 and 'R^2' of 0.60, to cause changes in the cash resource where as, the rest of the models were highly insignificant. However, in this model itself 't' statistic reveals that the change caused by the current liabilities on the cash was insignificant. A thorough look into the Table 13 reveals that it is very difficult to explain the correlation between cash and current liabilities, current assets and sales. It is thus concluded that the cash management in Swaraj Mazda Ltd., was highly erratic, unplanned and unpatterned.

Table 13: Step-wise Regression Results for All Possible Combinations of Dependant and Independent Variables of Swaraj Mazda Ltd.

Linear Regression Model	Multiple R	Coefficient of Determination (R^2)	Adjusted R^2	Significance 'F'	't' statistic(x_1, x_2, x_3)	Standard Error	Durbin Watson's Coefficient
$Y = 2.2197 + 0.04x_1$	0.46	0.21	0.11	0.18**	0.18**	3.08	1.521
$Y = 0.27 + 0.05\,x_2$	0.58	0.34	0.25	0.07**	0.07**	2.82	1.621
$Y = 1.88 + 0.02x_3$	0.57	0.33	0.24	0.084**	0.084**	2.84	1.514
$Y = -1.48 - 0.11x1 + 0.15x_2$	0.67	0.45	0.30	0.12**	$x_{1=0.25**}$ $x_{2=0.12**}$	2.73	1.809
$Y = 4.61 - 0.24x_1 + 0.09x_3$	0.78	0.60	0.49	0.039*	$x_{1=0.06**}$ $x_{3=0.03*}$	2.33	1.851
$Y = 0.67 + 0.04x_2 + 0.00x_3$	0.58	0.34	0.15	0.23**	$x_{2=0.74**}$ $x_{3=0.89**}$	3.01	1.583
$Y = 0 - 0.25x_1 + 0.12x_2 + 0.06x_3$	0.79	0.62	0.37	0.07**	$x_{1=0.055*}$ $x_{2=0.056*}$ $x_{3=0.10**}$	2.28	1.616

Legend:
Y = Cash, x_1 = Current Liabilities, x_2 = Current Assets, x_3 = Sales,
* Significant and ** is not significant at 5% significance level.

Source: Regression Test was Run Using SPSS Software.

Compounded Annual Growth Rate (CAGR)

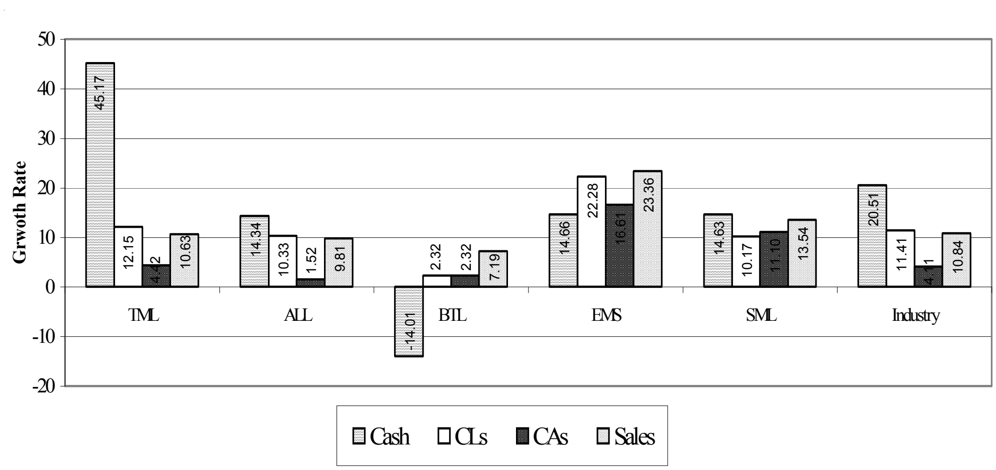
The compounded annual growth rate reveals the percentage of growth rate that took place between the beginning and ending period. This method provides a smooth rate of growth, which is a projected number that reveals, what would have been the growth rate in a variable on an annually compounded basis. As it could be observed in Table 14, the CAGR in cash across the industry was the highest at 20.51%. However, the growth rate in cash balance of the Bajaj Tempo Ltd., was negative by 14.01%. An indepth observation into the table reveals that the growth rate in cash balance of all the sample companies, barring Bajaj Tempo Ltd., was much higher than that of the other independent variables like current liabilities, current assets and sales. Figure 3 depicts that CAGR in cash balance of Tata Motors Ltd., Ashok Leyland Ltd., and Eicher Motors Ltd., was higher than that of any other variable. Thus, it is observed that the cash balance across the Indian Commercial Vehicles Industry grew much more than that of the current liabilities, current assets and sales.

Table 14: Compounded Annual Growth Rate in the Selected Variables of Sample Companies

Company → / Variable ↓	TML	ALL	BTL	EML	SML	Industry
Cash	45.17	14.34	-14.01	14.66	14.63	20.51
Current Liabilities	12.15	10.33	2.32	22.28	10.17	11.41
Current Assets	4.42	1.52	2.32	16.61	11.10	4.11
Sales	10.63	9.81	7.19	23.36	13.54	10.84

Source: Computed from the Data Available.

Figure 3: Compound Annual Growth Rate (Percentage) in Selected Variable of Sample Companies



Cash Conversion Cycle

Cash conversion cycle is the amount of time the firm's cash is tied up between the payment for production inputs and the receipt of payment from the sale of the resulting finished product. It is the number of days in the operating cycle, less the average payable period. As Lawarence J Gitman (2001) puts it, a positive and lengthier cash conversion cycle indicates that the firm has liberal credit policies to its customers and the negative cycle indicates a better management of the receivables and payables. Thus, ideally a firm would like to have negative cash cycle without losing sales or damaging its credit rating. Though some writers like Gentry *et al.* (1990) suggested weighted cash conversion cycle, the researchers took simple cash cycle into account in the present study, as there is no considerable difference between the two.

The data depicted in Table 15 reveals that Swaraj Mazda Ltd., had the highest positive cash cycle during the entire period

Table 15: Cash Conversion Cycle (Days) of Indian Commercial Vehicles Industry

Years	TML	ALL	BTL	EML	SML	Mean
1995	NA	NA	NA	NA	NA	NA
1996	-39	49	-66	-85	155	3
1997	-27	143	-94	-89	188	24
1998	-47	188	-133	-79	182	22
1999	-82	77	-114	-74	168	-5
2000	-116	58	-146	-67	163	-22
2001	-199	36	-150	-71	154	-46
2002	-252	-4	-126	-82	148	-63
2003	-251	-21	-93	-89	143	-62
2004	-223	-46	-73	-73	144	-54
Mean	-137	53	-111	-79	161	-23

Source: Computed from the Data Available in http://www.asiancerc.com

of the study indicating its very liberal credit policies towards its customers whereas, Tata Motors Ltd., on the other hand had the highest negative cash cycles indicating that the firm had managed the receivables very effectively. The ten-year average cash cycles indicate that Tata Motors Ltd., Bajaj Tempo Ltd., and Eicher Motors Ltd., had negative cash cycles while the Swaraj Mazda Ltd., and Ashok Leyland Ltd., had positive cash cycles. Thus, it is found that TML, BTL and EML performed better than SML and ALL in terms of cash conversion (Figure 4).

The one-way ANOVA results pertaining to cash conversion cycles of the sample companies are presented in Table 16. Since F_{cal}. (45.04) is greater than F_{cri}. (2.58) for 8 degrees of freedom at 5% significance level, we reject Ho_5 and conclude that there is a significant difference in the cash conversion cycles of the sample companies.

Figure 4: Cash Conversion Cycle (Days) of Sample Companies

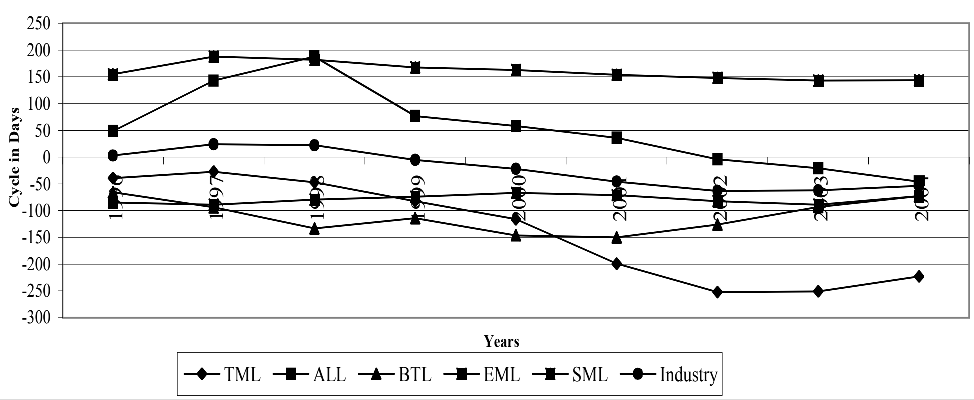


Table 16: One-way ANOVA Results for Cash conversion Cycle of Sample Companies

Source of Variation	SS	df	MS	F_{cal}	P-value	F_{crit}
Between Groups	570,309.11	4	142,577.28	45.04	0.00	2.61
Within Groups	126,632.00	40.00	3,165.80			
Total	**696,941.11**	**44**				

Legend:
SS = Sum of Squares; df = Degree of Freedom; MS = Mean Square;
F_{cal} = Calculated Value of 'F'; P-value = Probability Value of 'F';
F_{crit} = Table Value of 'F' at eight degrees of freedom and 5% significance level.

Source: One-way ANOVA was Performed Using MS-Excel Software.

Cash Flow Statement

Cash flow analysis provides a rich insight into the financial operations of the business that will be valuable to those who are interested in analyzing the past and future plans of the business. There are three activities in the construction of cash flow statement. They are, cash flows from operating activities, cash flows from investing activities and cash flows from financing activities. As it has been rightly observed by James C Van Horne (2002), each activity is self-explanatory and helps the financial manager in analyzing the company's financial performance from funds statement on a cash basis point of view rather than on the accounting point of view though there is a reconciliation between the two.

The data in Table 17 reveals that, ten year average profit before tax of Indian commercial vehicles industry was Rs. 475.40 cr. Of all the activities, operating activities alone contributed major part towards net cash increase while there was a cash outflow of the investing and financing activities. The data also reveals that the financing activities resulted in the cash outflow in the case of all the companies except Bajaj

Table 17: Cash Flow Statement of Sample Companies

(Rs. cr.)

Particulars	TML	ALL	BTL	EML	SML	Mean
Profit Before Tax	328.01	1,999.5	14.17	24.07	11.26	475.4
Net Cash Flow from Operating Activities	875.32	118.92	37.64	24.07	10.35	213.26
Net Cash Used in Investing Activities	-644.33	163.93	-44.53	32.1	-1.97	-98.96
Net Cash Used in Financing Activities	-155.77	-131.92	1.31	-20.23	-7.64	-62.85
Net Inc./Dec. in Cash and Cash Equivalents	75.2	3.08	-5.58	-10.45	0.75	12.6
Opening Balance	190.59	35.09	13.57	1.43	2.92	48.72
Closing Balance	265.79	70.67	7.99	3.64	3.66	70.35

Source: Extracted and Summarized from the Online Database of http://www.asiancerc.com

Tempo Ltd., On an aggregate basis, it is found that of all the companies, Tata Motors Ltd., was alone able to generate more cash inflows when compared to the other sample companies and in the case of Bajaj Tempo Ltd., and Eicher Motors Ltd., there was a net decrease in the cash flows.

CONCLUSION

This study throws light on the effectiveness of cash management in the sample companies. The results and discussions in the study throw light on the understanding as to what extent, the theoretical concepts of cash management are practiced by the sample companies. The study also helps the various stakeholders of the sample firms in understanding the effectiveness of cash management which in turn aids their decision-making process. Thus, the study revealed that Bajaj Tempo Ltd., Eicher Motors Ltd., and Swaraj Mazda Ltd., were highly efficient by achieving higher sales volume with less cash balances when compared to Tata Motors Ltd., and Ashok Leyland Ltd., that had slightly higher cash balances. The application of Karl Pearson's coefficient of correlation and student's 't' test revealed that there was a significant correlation between cash and sales of Tata Motors Ltd., and Ashok Leyland Ltd. Though there was a positive correlation between cash and sales of Eicher Motors Ltd., and Swaraj Mazda Ltd., 't' statistic revealed that such relationship was not significant. The multiple 'R' in regression analysis indicated that the cash balance of Swaraj Mazda Ltd., was indifferent to any of the independent variables like the current liabilities, current assets and sales. Whereas, in case of the other sample companies, the cash balance depended on and varied mostly along with the current assets and the current liabilities. On an aggregate basis, the results reveal that the management of the studied sample of companies need to exercise proper control in maintaining the cash balance by way of maximizing the cash turnover and minimizing the percentage of cash to the current liabilities, current assets and sales.

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Nature and Impact of Work Culture in Indian Colleges: An Empirical Study†

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This study focuses on the Indian higher educational institutions' work culture and its impact on teacher's intrinsic motivation. A unique context-specific questionnaire College Work Culture Profile (CWCP) is validated to diagnose the work culture dimensions in the Indian higher educational institutions. The immediacy of the social environment of the teachers in terms of their supervisor's interaction and transparent environment are found to have a profound impact on the behavior of the teachers. The work culture of a college is found to be significantly affecting the intrinsic motivation of the teachers. But, the work culture of the college is not having any effect on the performance of the students.

INTRODUCTION

Higher education in India is now facing a dramatic challenge to deliver. The ever growing population of the country needs to follow the trails as set by the higher educational institutions of India, to continue to deliver the promise of the 'largest scientific English speaking talent pool outside the United States of America.' Still the ravenous requirements of talent pool not only within India, but also throughout the world, necessitate the portals of Higher Education—the Universities and Colleges of India—to face the challenge with more astute planning and rendition. To ever cater to the largest knowledge capital pool that India has in the world, continuous development of the educational institutions is the need of the hour. Given the environmental demand, and particularly for the skilled talent from engineering and technical institutions, the role of such institutions to provide better learning environment turns to be important.

Even when the technical education system in India is supposedly delivering largest quantity of technically qualified engineers (with an approved intake of 359,721 students from 1,208 degree level institutions as of March 2003), the quality of the programs and the student outcomes are largely questioned. Particularly, the last two decades have witnessed the maximum growth rate in the private

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technical institutions. There is a mismatch between the technical skills of the graduates in the country and India's industrial needs. The resultant quality is fragmented (Patil, 2003). Though many perspectives of an educational system is blamed including poor infrastructure, obsolete curriculum, lack of professionalism, rigid policy frameworks and lack of cooperation between the government bodies and the private technical educations the role of teachers and their lackadaisical approach towards education gets the prominence. The teachers' mundane existence in the job, without any due regard to the holy outcome they are supposedly committed to, makes the plight of the system bad. The increasing concerns of the public school teachers' absence with almost 25% of teachers absent at any given time is a worse indication about the Indian schools' unlikely outcome (Kremer *et al.*, 2004).

PROBLEM REFINED—(DEFINING THE PROBLEM)

Given the need to motivate the faculty members in every organization so that a better result can be expected from them, the role of organizational work culture in determining the teaching faculty's motivation requires attention. The organizational culture particularly approached from the context of work relevant settings in a college and its impact on teacher's felt work motivation will give insight into the psychological and environmental interactions of a teacher. The private educational institutions particularly, the engineering colleges in India, which are mushrooming at an ever-growing rate, is the focus of this study. The teaching faculty's perception of the work culture as existing in engineering colleges and the impact of such culture on the intrinsic work motivation of them needs to be identified. From a holistic perspective, the problem in hand can be seen as the study of the cultural settings of engineering colleges in the state of Tamil Nadu, India as well as the relationship of the cultural environment to the faculty motivation. Such motivation has to be measured from work perspective alone than from any other sources like financial incentives or other perquisites. Does the work of a teacher really have the intrinsic motivation in it? If the teaching job is intrinsically motivating enough for the teachers so that the college management/administration can think of providing an environment—a unique work culture—which will support the teacher's job.

As the literature in organizational behavior also emphasizes the linkage between work culture and work motivation and that to a separate hypothesis based empirical study lagging, the main problem as addressed in this study is the nature of work culture existing in private engineering colleges and its impact on the teacher's work motivation. Moreover, the organizational literature particularly the school and educational research gives much focus on the role of organizational culture in determining the effectiveness of the schools. This issue is also addressed as a reinforcement study to assess the role of work culture as perceived by teachers and its impact on performance of colleges. The primary objective is to study the nature of the work culture profile in engineering colleges and further to address the role of work culture in engineering colleges and its impact on intrinsic motivation of teaching faculty as well as its link to the performance of the college.

The following needs and questions are addressed by this research:

1. Need for a unique work culture measurement tool catering to measure the work culture existing in the higher educational institutions in India.
2. Whether there is any relationship between work culture of colleges and teacher's intrinsic motivation?
3. Does the work culture of colleges as perceived by the teaching faculty affect the performance of the college?

WORK CULTURE VS. MOTIVATION: A REVIEW

Though many authors have quoted about the role of culture in determining the motivation level of employees, a few have done empirical work and they established the link between culture and motivation (Aycan, 2001; Schwalb, 1992; Super and Sverko, 1995; and Yu and Yang, 1994). This signifies that the cultural understanding of a subject's context (National level, Regional level) is important in motivation research (Brislin *et al.*, 2005). Brislin *et al.* (2005) feel that culture is one of the several components influencing work place motivation and supported by Markus and Kitayuma (1991) and Munro *et al.* (1997). The dialectic relation between culture and motivation is bridged through the cross-cultural motivational research (Erez, 1994; and Erez and Earley, 1993). A trichotomous model called as the dynamic triangle of motivation is proposed by Ostertaker (1999) within which culture is a foundational element dynamically relating to both organizational culture and individual tendencies in shaping an individual or group's perspective on aspects of motivation.

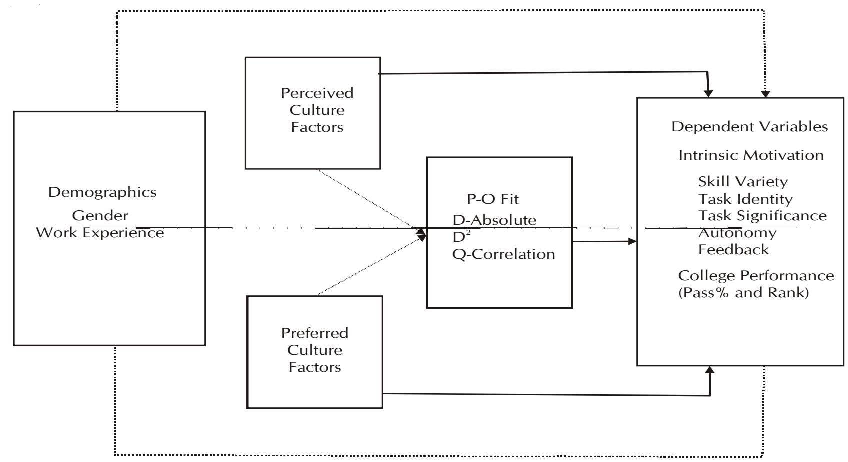
Further, Brislin *et al.* (2005) argue that managers must understand the culture and psychology of their work force which will have an impact on their motivational strategy. For example, if one is managing a work force that greatly values 'quality of life' aspects such as leisure time and time with family and attempting to increase motivation through pay might back fire. Brislin *et al.* (2005) opines that culture is strongly linked to motivation. So, dynamic cultural shifts may have an important influence on evolving work place motivation. All these inferences give a strong evidence for the link between the culture and motivation. But, here the culture is approached from a macro perspective, i.e., from national and regional cultures. Organizational culture is only referred here, and not conclusively, proved with a hypothesis.

RESEARCH DESIGN

The research model for the proposed study is based on similar such study of organizational culture and behavioral intentions of individuals in hospitality industry (Tepeci, 2001). As shown in the model (Figure 1), it has been decided that the organizational work culture will be measured using the Person-Organization fit model as developed by O'Reilly *et al.* (1991) and the motivation is measured through the well established and widely used Job Diagnostic Survey by Hackman and Oldham (1980).

The Organizational Cultural Profile (OCP) is an ideal concept to measure the

Figure 1: The Research Model



work culture existing in the educational sector because it is a service industry and many researchers have applied this tool in various industry profiles including service industries. Woods (1989) and Tepeci (2001) have applied this tool in hospitality industry, which is a service industry. Similarly, the OCP model is applied to study the hotel industry (Christensen, 1988; Kent, 1990; and Pizam, 1993) and service industry culture studies (Siehl, 1992; and Chatman and Jehn, 1994). Although the OCP model is tested for construct validity across various samples namely accountants (Chatman, 1991; and O'Reilly *et al.*, 1991), Service industry employees (Chatman and Jehn, 1994), Government employees (O'Reilly *et al.*, 1991), Hospitality industry (Tepeci, 2001), Healthcare professionals (Vandenberghe, 1999) and students and campus recruiters (Cable and Judge, 1997; and O'Reilly *et al.*, 1991), the teachers and colleges as the unit of study requires new variables to be operationalized than the original variables of OCP.

Moreover, as the Indian work culture context differs from the Western context, the culture specific variables need to be identified. As culture is to be measured value based (Denison, 1996; and Howard, 1998) and context specific, it needs a customized instrument taking into count the local value systems in any society. So, it demands a separate validation process to develop a unique instrument to cater to the educational institutions' requirement and to measure their culture. Such validated questionnaire needs to get tested and retested but care should be emphasized, so that it is based on the P-O fit model (OCP). Vandenberghe (1999) recommends more such cross-cultural analysis of the OCP and stresses the additional work needed on the structure of OCP across nations and industries.

VALIDITY AND RELIABILITY OF THE STUDY

To prepare the contextual college work culture questionnaire, it requires operationalizing the list of items to measure the concepts involved in the study. Initially, the content validity of the items is established by referring to four relevant but contextually different validated questionnaires, for ensuring a comprehensive coverage on the work culture dimensions. By referring to four standardized questionnaires namely Organizational Culture Profile (OCP), (O'Reilly *et al.*, 1991); Hospitality Industry Cultural Profile (HICP), (Tepeci, 2001); School Culture Inventory, (Maslowski, 2001) and Organizational Trust Questionnaire, (Ribiere, Defuria, 2001), a list of 150 items representing the college work culture is identified. Also, the relevancy of the Indian context is ensured by adding the items which are peculiar to the working nature of Indian educational institutions. Further, the face validity is established by giving the list of items to seven teaching faculty (judges) including two authors of the referred questionnaires. They short-listed the items based on relevancy, discriminability, non-redundancy and readability (O'Reilly *et al.*, 1991) to a list of 74 relevant items.

The 74 items are subject to a pilot study with a sample size of 205 [As per Guadognoli *et al.* (1988), a minimum of 100-200 cases are required to run factor analysis on the data]. The response rate is 79% with 162 usable questionnaires returned for analysis. The main objectives of the pilot study are to identify the relevant culture variables, which are highly correlated to each other, and to remove the distant items, which are not closely correlated to other items. Also, it will help to figure out the initial factor structure of the variables so that, the identified factors will show Convergent and Discriminant validity through their factor loadings. Based on the Anti-image correlation matrix of the factors, the items, which fall under the value of 0.75, are removed as distant measures and 36 items are removed leaving the KMO statistic at 0.866. The factor analysis of the remaining highly correlated 38 items formed ten distinct initial factors explaining an overall variance of 6.41% and overall Cronbach's Alpha measure as 0.931, which shows higher reliability of the items.

The convergence of items on ten different factors shows that there is an evidence for construct validity of the items. Based on the finalized 38 items, a questionnaire to measure perceived work culture in colleges is prepared and along with that, another similar questionnaire with the 38 modified items, to measure the preferred culture in the colleges is also added. For measuring the intrinsic motivation of the employees the Hackman and Oldham's (1980), Job Diagnostic Survey is used.

The external validity of the study is enhanced by adopting a random sampling procedure in a multi-phase manner. Initially the total sample size required for this study is measured based on the measurement model in a normal distribution (Exhibit 1).

Exhibit 1: The Sample Size Estimator Based on Normal Distribution

$$x = Z^2_{(C/100)} \times r(100 - r)$$

$$n = Nx/(N - 1)E^2 + x)$$

$$E = \sqrt{\frac{(N - n)x}{n(N - 1)}}$$

n = Sample Size, E= Margin of Error, N= Population Size

r = Fraction of responses the reseacher is interested in

$Z^2_{(C/100)}$ = Critical value for a confidence interval 'c'

Assuming a population of infinity (above 20,000), the minimum recommended sample size for a 98% confidence level turned out to be 527 (Raosoft sample, 2006). To randomly attain this sample size, the total of 227 engineering colleges in Tamil Nadu, India are considered as the initial sampling frame. The colleges are selected in random in the first phase of sampling. The Principal/Director of each randomly selected college is approached officially for permission to meet and collect data from their faculty. In the second phase of sampling, a minimum of 25-50% (based on the permission given by the respective heads of the 16 colleges thus randomly selected) of the faculty from each college are selected in random and the process is continued until the requisite samples of 527 samples are attained.

All the data are initially assessed for the fulfillment of the assumptions involved in multi-variate analysis namely normality, linearity and homoscedasticity. Most of the variables fulfilled the required conditions. Nine samples with incomplete data are removed leaving the sample size at 518. As the sample size of the final study is changed, factor analysis is conducted again to know the change in the factor structure. The perceived culture items converged on seven factors in the final analysis, explaining a total variance of 57.10% and over all Cronbach's Alpha as 0.918. The preferred culture items converged on eight factors explaining 55.68% variance for n = 518. Keeping the perceived culture initial factor structure as the initial model, confirmatory factor analysis is conducted for both perceived and preferred culture items to test the model fit, as the preferred culture initial factor structure is weak, which has sub scales with very less alpha value and a single item factor.

The perceived culture factor structure has shown moderate to good fit measures in the Unweighted Least Squares (ULS) procedure, after deleting one factor and two items from the initial model (Table 1). The preferred culture factor structure turned out with goodness of fit measures ranging from partly good to partly lower in fit in the Maximum Likelihood (ML)model, after deleting three factors and ten items from the initial factor structure. Thus, the confirmatory procedure proves the construct validity of the College Work Culture Profile (CWCP). The modified factor structure of both the dimensions of College Work Culture Profile (CWCP) have almost similar factor structure but with the items loading differently under the various factors. When the Cronbach's Alpha (α) is examined for all the sub scale dimensions which yielded satisfactory measures (Table 2).

Table 1: Goodness-of-fit Measures for the Work Culture Models

	RMSEA	RMSR	GFI	AGFI
Perceived Culture Model (ULS)	0.075	0.052	0.98	0.98
Preferred Culture Model (ML)	0.077	0.049	0.84	0.81

ANALYSIS AND INTERPRETATION

The data from the 518 samples are subject to hierarchical regression analysis. The independent variables are the P-O fit measures, which are calculated by simply

Table 2: Reliability Scores and Scale Values of College Work Culture Profile

Perceived Culture Dimensions	α	$\bar{X}^1$	σ	Perceived Culture Dimensions	α	$\bar{X}^1$	σ
Core Values	0.874	5.40	1.00	Core Values	0.774	6.18	0.61
Support	0.904	5.28	1.36	Transparency	0.743	5.92	1.03
Formal Systems	0.835	5.53	1.01	Support	0.836	6.22	0.79
Results Orientation	0.769	5.76	0.86	Formal Systems	0.839	6.28	0.63
Transparency	0.605	4.46	1.30	Results Orientation	0.689	6.34	0.65
Work Ethic	0.747	5.21	1.20				

[1] Mean Value Based on Likert Rating Scale (1-7).

correlating the perceived and preferred culture items (Q) (Chatman, 1991). To triangulate the results through the 'methodological triangulation' procedure (Denzin, 1970), two more P-O fit measures namely, D-absolute where the absolute difference between the perceived and preferred culture items are taken and the D-Square where the squared differences between the three measures are taken (Tepeci, 2001). Further, the analyzes are made at individual level and cross-organizational level to facilitate multiple levels of analysis in the study of organizational culture (Witte and Muijen, 1999). The individual level analysis involves calculation of P-O fit for every individual in a college. In the cross level analysis, the aggregate perceived culture profile of each college is compared with each employees' preferred culture values in that college and P-O fit measures are thus calculated.

The intrinsic motivation, which is measured as the Motivation Potential Score (MPS), is the dependent variable. It is measured through five job characteristics namely, skill variety, task identity, task significance, autonomy and feedback from the job (Hackman and Oldham, 1980). The motivation is measured through the Hackman and Oldham (1980) formula (Exhibit 2).

Exhibit 2: Motivation Potential Score Formula

$$MPS = \left[\frac{Skill\ Variety + Task\ Identity + Task\ Significance}{3}\right] \times Autonomy \times Feedback$$

Source: Hackman and Oldham, 1980.

The performance of the college, another dependent variable, is collected as a secondary data source based on the rankings and pass percentage of each of the 16 colleges taken under study based on earlier studies in educational settings (Maslowski, 2001). The data is published semester wise by the central university under which all the technical institutions are affiliated. The average overall pass percentage for the 16 colleges are calculated from the pass percentage of semesters April 2003, November 2003, April 2004 and November 2004. Similarly, the average rank positions of the college is also calculated for the four semesters and included as an additional measure to evaluate the performance of a college.

The multiple regression analysis is conducted seperately keeping the MPS and Pass (and rank) percentage of the colleges as dependent variables respectively. The independent variables in both the cases are the three P-O fit measures. The hierarchical regression model is also made with constraints, where the six perceived culture factors and the five preferred culture factors are entered as a set of two blocks and the effect of the P-O fit measures on the motivation potential of the job over and above the constraints are tested. In case of the performance measure of the college and its relationship study with work culture, one more independent variable namely 'culture strength' is calculated as the inverse of the standard deviation of the perceived culture factors among all the teaching faculty in a college (Gordon and DiTomaso, 1992). This is again is a methodological triangulation procedure to be more conservative in interpreting the results.

The initial directional hypothesis set in the study is that:

H_A*: *There is a significant relationship between the work culture of a college as perceived by the teachers and the teacher's intrinsic motivation.

Individual Level Analysis (ILA): (Tables 3 and 4)

- Regression analysis with constraints—Support from one P-O fit measure.
- Regression analysis with out constraints—Support from three P-O fit measures.

Cross Level Analysis (CLA): (Tables 3 and 4)

- Regression analysis with constraints—Support from two P-O fit measures.
- Regression analysis with out constraints—Support from two P-O fit measures.

Interpretation: As there is considerable support from both the levels of analysis and the methodological triangulation procedures of multiple P-O fit measures giving significant support, the alternate hypothesis that there is a strong relationship between work culture of a college and the intrinsic motivation of the faculty members is accepted. Also the work culture is able to predict the amount of intrinsic motivation felt by the faculty, supporting the role of work culture as the independent variable and motivation as the dependent variable. The caveat here is that, causal relationship cannot be proved through these analysis and this is only a correlational study. So, the first directional hypothesis is proved through this study. Also, this study further lends support to the role of calculated P-O fit in explaining behavioral intentions of people in line with previous studies (Vandenberghe, 1999; Cable and Judge, 1997; Chatman, 1991; and O'Reilly *et al.*, 1991).

Similarly the second directional hypothesis for this study is that:

H_A: There is a relationship between the work culture of a college as perceived by the teachers and the performance (average pass rate and rank position) of the college.

Table 3: Individual Level and Cross Level Hierarchical Regression Analysis with Constraints

	MPS^-Individual Level				MPS^-Cross Level			
			Change				Change	
	Beta	R^2	R^2	F	Beta	R^2	R^2	F
Step 1: Demographics		**0.028 (0.024)**	**0.028**	**7.450****		**0.028 (0.024)**	**0.028**	**7.445****
Gender	-0.025				-0.025			
Experience	0.160**				0.160**			
Step 2: Perceived Culture		**0.187 (0.174)**	**0.158**	**16.52****		**0.187 (0.174)**	**0.158**	**16.521****
Core Values	-0.056				-0.056			
Support	0.231**				0.231**			
Formal Systems	0.114				0.114			
Results Orientation	0.107				0.107			
Transparency	0.119*				0.119**			
Work Ethic	0.005				-0.005			
Step 3: Preferred Culture		**0.227 (0.207)**	**0.041**	**5.32****		**0.227 (0.207)**	**0.041**	**5.332****
Core Values#	0.033				0.033			
Transparency#	-0.068				-0.068			
Support#	0.048				0.048			
Formal Systems#	0.150*				0.150**			
Results Orientation#	0.049				0.049			
Step 4: P-O Fit								
|*D*|	**-0.166**	**0.232 (0.211)**	**0.005**	**3.20**	**0.169**	**0.249 (0.228)**	**0.022**	**14.720****
D^2	**-0.165**	**0.234 (0.213)**	**0.007**	**4.32***	**0.138**	**0.243 (0.222)**	**0.016**	**10.612****
Q-Correlation	**0.077**	**0.232 (0.210)**	**0.004**	**2.92**	**-0.042**	**0.229 (0.207)**	**0.001**	**0.970**

Note: R^2 values in paranthesis are adjusted R^2, ^MPS- Motivation Potential Score, ** $p<0.01$, * $p<0.05$, #- Preferred Culture values.

- P-O fit measures regression analysis: No support for all three P-O fit measures.
- Culture Strength regression analysis: No Support (Table 5).

Interpretation: Since, there is no significant predictive power for the work culture of a college which is measured through two different methods, on the pass rate and rank position of the college, it can be interpreted that, work culture of a college is not affecting the perfromance of a college. The null hypothesis is accepted. This is no surprise

Table 4: Individual and Cross Level Regression Analysis without Constraints

Step I: Demographics	MPS^-Individual Level			MPS^-Cross Level		
		Change			Change	
	R^2	R^2	F	R^2	R^2	F
	0.028 (0.024)	0.028	7.445**	0.028 (0.024)	0.028	7.445**
Step II: P-O Fit						
$\vert D\vert$	0.125 (0.120)	0.097	56.685**	0.054 (0.049)	0.026	14.309**
D^2	0.111 (0.106)	0.083	48.007**	0.042 (0.036)	0.014	7.317**
Q	0.068 (0.063)	0.040	21.976**	0.028 (0.022)	0.000	0.000

Note: R^2 values in parenthesis are adjusted R^2, ^MPS- Motivation Potential Score, ** p<0.01, * p<0.05.

Table 5: Regression Analysis for the Performance Measures

	Pass%			Rank		
		Change			Change	
	R^2	R^2	F	R^2	R^2	F
Step I: Demographics	0.623 (0.565)	0.623	10.737**	0.511 (0.436)	0.511	6.795*
Step II: P-O Fit						
$\vert D\vert$	0.627 (0.534)	0.004	0.130	0.525 (0.407)	0.014	0.364
D^2	0.634 (0.543)	0.011	0.367	0.537 (0.421)	0.026	0.669
Q	0.623 (0.529)	0.000	0.005	0.518 (0.397)	0.007	0.167
Step II: Cultural Strength (Triangulation) Average SD	0.653 (0.567)	0.030	1.054	0.552 (0.440)	0.041	1.087

Note: R^2 values in parenthesis are adjusted R^2, ** p<0.01, * p<0.05.

even though it contradicts the existing literature that shows that there is a relationship. Maslowski (2001) in his study on the role of school culture on the school performance has come out with a similar finding where the school culture is not related to the students' performance. Similarly Kusluvan and Karamustafa (2003) have reported empirical studies where organizational culture is not related to performance. This result is further validated by applying a methodological triangulation procedure by calculating culture strength and the same is tested for relationship with student's performance. Once again it showed lack of relationship of work culture and performance of students.

IMPLICATIONS OF THE STUDY

The study has immediate applications for the organizational researchers and the college administrators who are practically managing the educational institutions.

The organizational literature has hinted on the link between the organizational culture and motivation. This study establishes the link by an empirical work through a hypothesis. This shows that the work culture of an institution will profoundly affect the intrinsic motivation of the individuals. This further validates the Hackman and Oldham's (1980) findings that the external climate like supervisor support has to be supportive to sustain intrinsic motivation among employees. The role of immediate supervisor and the transparency in the environment are the dominant culture variables which influence the motivation of individuals. This means that the immediacy of the social environment in terms of interpersonal interactions (Supervisor) and ambience of the environment (Transparency) have a maximum impact on the individual behavior. The organizational researchers' recent focus on the individual behaviors based on social interactions is more reflective from the findings in this research work.

Moreover, the higher educational institutions in India can have a valid instrument to measure their work culture through the College Work Culture Profile (CWCP). This also has applications to academic researchers who can further validate this instrument by testing it in various geographical locations in India, as naturally Indian culture is diverse and differing with geographical locality. The selection of new faculty members can come handy by analyzing the cultural fit of the candidates to the institution. This recommendation is based on the Chatman's (1989) study using the P-O fit model. This research gives indication to the college administrators to seriously view the cultural environment so as to motivate and retain good and competent faculty members. Similar to the previous interaction studies, this research also gives good support for the predictive power of P-O fit variables.

CONCLUSION

Thus, from the above research it can be concluded that the culture does have an impact on the intrinsic motivation of the teaching faculty and it does not have any impact on the performance of the college. Since, the study is of a correlational type, it recommends future causal study to prove the relationship with further evidence. The performance of the Indian engineering colleges has to be measured beyond the pass rate and rank levels of each college. Further research may be carried out based on the student's job placement rate as a performance measure. Other than that, the study also revealed the basic culture profile of the colleges which shows that the supervisor support and transparency in an organization's work culture claims to have more impact on the intrinsic motivation of the teachers.

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Antecedents to Knowledge Transfer: Trust and Culture

Tripti Singh and R K Premarajan***

The motto of most organizations today is to capture the knowledge before it retires or walks out from the organization. Organizations have realized that leveraging the power of knowledge is critical for achieving competitive differentiation. This study attempts to find the effect of trust and culture on tacit and explicit knowledge transfer. About 125 knowledge workers from the 11 Indian software organizations took part in the study. The results suggest that sharing and adaptation trustworthiness and sharing and adaptation culture are positively related to tacit and explicit knowledge transfer.

INTRODUCTION

When an employee walks out of an organization, the knowledge acquired by him/her also walks out of the organization; the knowledge that was acquired through years of experience in the organization is likely to advantage their competitors. Organizations today are building databases to capture explicit knowledge. The primary focus is on developing new applications of information technology to support the digital capture, storage, retrieval, and distribution of an organization's explicitly documented knowledge. Increasingly, organizations are realizing that the most valuable knowledge is the tacit knowledge existing within peoples' head, augmented or shared via interpersonal interaction and social relationships. Capturing the tacit and ambiguous knowledge needs different set of planning and strategy. To this end, many organizations have initiated a wide range of knowledge management projects and programs. Organizations are busy devising ways to facilitate the transfer of such skills and knowledge. An effective knowledge transfer practice, especially the tacit knowledge, gives strategic and competitive advantage to organizations.

Knowledge transfers among organizational units provide opportunities for mutual learning and inter-unit cooperation. This stimulates the creation of new knowledge and at the same time contributes to organizational unit's ability to innovate (Kogut and Zander, 1992; and Tsai and Ghoshal, 1998).

KNOWLEDGE TRANSFER DEFINED

Transfer of knowledge occurs whenever existing knowledge and skills affect the way in which new knowledge and skills

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are learnt and performed. Knowledge transfer at individual level is how knowledge acquired in one situation applies (or fails to apply) to another (Singley and Anderson, 1989). At the organizational level, it is a process in which an organization recreates and maintains a complex, causally ambiguous set of routines in a new setting (Argote *et al.,* 2000).

Transfer of knowledge occurs whenever the prior learned knowledge and skills affect the learning and performance of new knowledge and skills. When acquisition or performance of new knowledge and skills is facilitated, transfer is positive. When acquisition or performance is impeded, transfer is negative. Transfer is non-existent, when it has no effect on the second task. Transfer can be general (i.e., content independent), affecting a wide range of new knowledge and skills, or specific (i.e., content dependent), affecting only particular knowledge and skills within a circumscribed subject matter (Mandler, 1962). According to Davenport and Prusak (1998: 101), transfer of knowledge involves both the transmission of information to a recipient and absorption and transformation by that person or group.

TYPES OF KNOWLEDGE

Researchers have classified knowledge largely into explicit knowledge and tacit knowledge.

Explicit Knowledge: It is conceived as some knowable truth that can be codified and separated from the minds of the people. It is that part of knowledge, which can be articulated, formalized and communicated. For instance, the part of 'product knowledge' that can be easily codified and separated from the minds of the people is an explicit knowledge. According to Nonaka and Takeuchi (1995: 8), explicit knowledge can be expressed in words and numbers, and can be easily communicated and shared in the form of hard data, scientific formulae, codified procedures, or universal principles. Thus, this knowledge is viewed synonymously with a computer code, chemical formula, or a set of general rules.

Tacit Knowledge: It is that part of knowledge that cannot be codified and separated easily from the minds of the people. This type of knowledge is difficult to be articulated, formalized, and communicated. According to Nonaka and Takeuchi (1995: 8), tacit knowledge is something that is not easily visible or expressible. Tacit knowledge is highly personal and hard to formalize, making it difficult to communicate or to share with others. Subjective insights, intuitions, and hunches fall into this category of knowledge. It is deeply rooted in an individual's action and experience, as well in the ideals, values, or emotions he or she embraces.

Two different schools regarding externalization and codification of tacit knowledge exist. One that believes that tacit knowledge must be made explicit for sharing and another that regards tacit knowledge as always being tacit. Nonaka and Konno (1998) created a model of knowledge creation in the SECI-model. This model concerns transfer of tacit knowledge. They assert that the process include four modes, which are socialization, externalization, combination, and internalization in an ongoing circular movement.

Ambiguous Knowledge: It is that part of tacit knowledge that can be understood in more than one-way. This knowledge is difficult to be documented and is shared through story telling. This form of knowledge is also learnt through experience, but not necessarily through long years of experience. The acquisition of this form of knowledge is not through a knowledgeable teacher or an expert. It could just be a sharing of an opinion or observations by an individual who has gone through an activity or an experience. This type of knowledge resides in individual's vast mental store of experience (Strover, 2005).

Constant *et al.* (1994) defined 'expert knowledge' as a knowledge involving intangible information embodied in human memory, knowledge, experience, or skill such as learning a statistical program. Experts' countless experiences in a great variety of contexts to recognize patterns draw upon the tacit dimensions of the experts' knowledge underlying the more explicit (and explicable) rule-based reasoning. It is the knowledge that can only be transferred through experts.

VARIABLES INFLUENCING KNOWLEDGE TRANSFER

Knowledge transfer can occur informally or unconsciously in the absence of deliberate intention to teach or learn. However, the processes of internalization can be aided or hindered by organizational experts, and this informal learning can be encouraged or discouraged by management practices (Swap *et al.*, 2001).

According to Szulanski (1995), the necessary conditions for the transfer of knowledge include specific characteristics of the knowledge transferred and the transfer situation. The characteristics of the knowledge transferred, revolves around perceptions of the usefulness of the knowledge. Katz and Allen (1982) highlight the role of motivation to transfer knowledge. Cohen and Levinthal (1990) discuss the absorptive and retentive capacity of the recipient, and conduciveness of the organizational environment. Constant *et al.* (1994) found that attitudes about different types of information sharing (information product versus expertise) were associated with different antecedents. Trust and culture as important antecedents to knowledge transfer are discussed in the following section.

CULTURE: AN ANTECEDENT TO KNOWLEDGE TRANSFER

According to Nonaka and Takeuchi (1995: 42), organizational culture consists of beliefs and knowledge shared by the members of the organization. They further state that though organizational culture studies have recognized the importance of knowledge; they have not given it its due place. Duhon (1998) found that accessing tacit knowledge has as much to do with managing the internal culture of the organization as with implementing technology. This is the dark side of knowledge as power. People refuse to share their knowledge out of fear, confusion, and sometimes, stubbornness.

Orlikowski (1992) found that in competitive and individualistic organizational cultures, where there were few incentives or norms for cooperating or sharing expertise, the groups did not engender collaboration.

Sharing is important for an effective knowledge transfer. A culture that promotes sharing of knowledge possessed can be defined as 'sharing culture'. Knowledge transfer is incomplete without adaptation of knowledge. Organizational culture that promotes knowledge adaptation by giving support or motivation to use the acquired knowledge can be defined as 'adaptation culture'.

TRUST: AN ANTECEDENT TO KNOWLEDGE TRANSFER

Avoiding knowledge hoarding based inefficiencies requires an overt effort on the part of management to create an environment of trust where people feel secure enough to share their knowledge (Allison, 2000).

Knowledge transfer requires trust both to share and adapt knowledge. Trustworthiness of the transferee (the trust that the transferor has on the transferee for no misuse of the knowledge) and the trustworthiness of the organization (the sharing of knowledge would not reduce individual's value to the organization) can be defined as 'sharing trustworthiness'.

'Adaptation trustworthiness' can be defined as the trust that people have on the knowledge reservoirs or the transferor while using the knowledge for further knowledge creation. It is also the trust that people have on the organization, even if they use someone else's idea, due recognition will be given to their effort and contribution.

THE PRESENT STUDY

Kurtzberg and Darr (2000) have defined knowledge transfer as more than just sharing of knowledge. According to them, knowledge transfer occurs only when contributor shares knowledge that is used by the receiver. Unlike most of the studies that have equated knowledge transfer to just sharing of knowledge (Huber, 1991) this study focuses both on sharing and adaptation of knowledge.

The study tries to understand the relationship of culture and trust with knowledge transfer. Both sharing and adaptation aspects of the two independent variables, i.e., culture and trust, have been studied. Therefore, the study consists of four independent variables: sharing culture, adaptation culture, sharing trustworthiness, and adaptation trustworthiness. The study focuses on three types of knowledge: product knowledge, expert knowledge, and ambiguous knowledge.

Culture plays an important role in knowledge transfer. Karlsen and Gottschalk (2004) found that the success of projects in IT organizations relate to the extent of culture for effective knowledge transfer. According to De Long and Liam (2000), culture influences behavior central to knowledge creation, sharing and use in several ways. Culture creates the context for social interaction that determines how knowledge will be shared in particular situation. Culture could be an enabler of knowledge transfer. Jones *et al.,* (2006) examined eight dimensions of culture and their impact on how ERP implementation teams are able to effectively share knowledge across diverse functions and perspectives during ERP implementation. They have identified several dimensions of culture that facilitate knowledge transfer. Transfer of knowledge requires willingness of the group or individual to work with others and share knowledge for their mutual benefit. This means that knowledge transfer cannot occur if the employees of the organization do not show high level of cooperative behaviors. If the members do not have natural tendency to share and collaborate with others, knowledge transfer would be difficult.

Certain management practice can influence the culture of the organization. According to Goh (2002), if the decisions are taken openly information is widely open and accessible to the employees. The transparency in decision-making and sharing of information by the organization can emphasize the culture of the organization towards knowledge sharing. Similarly, fair treatment of the employees and rewards that emphasize shared success being given to all who contribute, are management practices that will increase knowledge sharing. A culture of problem seeking and problem solving (experimenting and innovative culture) encourages employees to look at problems as a way to improve the organization. If employees and the organization treat failures as learning lessons, employees will be more willing to adapt new knowledge. Thus, culture can significantly increase the propensity of the organization's member to share and adapt knowledge freely with each other. Therefore, we hypothesize that:

Hypothesis 1*—Sharing and adaptation culture will be positively related to the ambiguous knowledge transfer.*

Hypothesis 2*—Sharing and adaptation culture will be positively related to transfer of expert knowledge.*

Hypothesis 3*—Sharing and adaptation culture will be positively related to product knowledge transfer.*

Trust is a social process related to the perceptions held by one party about another party's abilities, expertise, knowledge, motives, or intentions (Lewis and Weigert, 1985). There is an expectation in trust that one party will make reliable promises and fulfill its obligations. Trust is an outcome of gradual and consistent effort over time. It evolves through the process of growth of knowledge and understanding of people with whom one must interact, plus the actual experience of interacting with that party. Trust is individuals' interpretation of another's actual or likely behavior (Blois, 1999). When the transferor of knowledge has trust on the recipient, then only he or she is likely to share the knowledge. If the transferor's interpretation of the recipient's likely behavior is not positive, the willingness to share knowledge will not exist. Similarly, the recipient's trust on the transferor's motives, intentions, expertise, abilities, and knowledge will determine whether the recipient is likely to use and adapt the knowledge shared. Trust seems to play an important role in determining the sharing and adaptation of the knowledge. Therefore it is hypothesized that:

Hypothesis 4*—Sharing and adaptation trustworthiness between the source of knowledge and the recipient will be positively related to ambiguous knowledge transfer.*

Hypothesis 5*—Sharing and adaptation trustworthiness between the source and the recipient of knowledge will be positively related to expert knowledge transfer.*

Hypothesis 6*—Sharing and adaptation trustworthiness between the source and the recipient of knowledge will be positively related to product knowledge transfer.*

METHODOLOGY

The technological growth of the Indian economy makes it a knowledge driven economy, which makes it very essential to study the factors that impede or enhance knowledge transfer in the Indian context. Research on knowledge management has almost ignored tacit knowledge transfer in Indian organizations. The little work that is available on knowledge transfer focuses on knowledge that can be codified. This study is an attempt to find the relationship of factors like organizational culture and trustworthiness with both tacit and explicit knowledge transfer.

VARIABLES AND MEASURES

The independent variables for the purpose of the study are adaptation culture, sharing culture, adaptation trust worthiness, and sharing trustworthiness. The dependent variables of the study are ambiguous knowledge transfer, expert knowledge transfer, and product knowledge transfer.

Multiple items are used to measure each of the variables under study. The items for the questionnaire are based on Bukowitz and Williams (1999). These items were measured on Likerts' five-point scale. The reliability coefficient for the variables ranged from 0.53 to 0.81 (Table 1).

Adaptation culture has been measured on 3-item questionnaire. Example of the item to measure adaptation culture is: 'People in organizations can use the information they get to improve their work'.

Sharing culture has been measured by 7-item questionnaire. 'Knowledge sharing is publicly recognized', is an example for items in 'sharing culture' questionnaire.

Adaptation trustworthiness has been measured on 3-item questionnaire. 'People value the knowledge from experts in using it at critical decision point' and 'People are sure of the due recognition of their efforts no matter whose idea they apply to do a particular job' are examples of the items used to measure adaptation trustworthiness.

Sharing trustworthiness has been measured on 5-item questionnaire. 'People in the organization are confident that the information shared would not be misused' is one of the items to measure sharing trustworthiness.

Ambiguous knowledge transfer has been measured by 10-item questionnaire. Items like 'the knowledge that is difficult to document is identified and shared through story telling' are used in the questionnaire.

Expert knowledge transfer has been measured on 6-item questionnaire. 'Experts hold frequent on job training', is an example of items used to measure expert knowledge transfer.

Product knowledge transfer has been measured on 6-item questionnaire. 'Product team of a new product gives detailed presentation regarding the product to all employees', is an example of item used to measure product knowledge transfer.

SAMPLE

The data was collected from knowledge workers of 11 organizations in India. The questionnaires were randomly sent to 20 knowledge workers working in each software organization. About 125 responses were received. Respondents were mostly Senior Developer, System Analyst, Project Manager, Developer, and Programmer. They responded in the context of their organization. The average age of the respondents was 28 years. The minimum work experience of the respondents was one year. The average work experience was around six years.

ANALYSES AND RESULTS

The reliability coefficient for the variables ranged from 0.53 to 0.81 (Table 1, Annexure). Regression analysis was done to test the hypotheses. The statistical results obtained through multiple regressions are tabulated in the Tables 2, 3 and 4 (Annexure).

Table 2 shows that Hypotheses 1 and 4 were supported. This indicates that the sharing and adaptation of ambiguous knowledge is highly dependent on the trustworthiness of the transferor, the recipient, the organization, and the culture of the organization.

Table 3 shows that Hypotheses 2 and 5 were supported indicating that the transfer of expert knowledge is highly dependent on the knowledge transfer culture and the trustworthiness of the transferor, the transferee, and the organization.

Table 4 proves Hypotheses 3 and 6 indicating that product knowledge transfer is highly dependent on knowledge transfer trustworthiness between the transferor and the transferee, the transferor, the organization, and the knowledge transfer culture of the organization.

The analyses of data significantly affirm that knowledge transfer is highly dependent on the culture of the organization and the trustworthiness of the receiver, the transferor, and the organization. It indicates that not only the sharing and adaptation of tacit knowledge i.e., the ambiguous knowledge and the expertise are dependent on organizational culture and level of trust between the transferor and the transferee, but the transfer of explicit knowledge, i.e., product knowledge is also highly dependent on the above factors.

This reflects that people perceive that sharing and adaptation of any form of knowledge requires a culture that promotes knowledge transfer and trust between the transferor and the transferee. It also reflects that the transferor should trust the organization, i.e., the transferor should trust that he or she would not in anyway be at a position of disadvantage in the organization by transferring the valuable knowledge that he or she possesses.

DISCUSSION

The results of the study are in line with the existing literature on knowledge transfer. However, some significant results are interesting to note. The results showed that transfer of any type of knowledge is significantly related to both perceived culture of an organization, as well as to the trustworthiness of the transferor or the transferee.

A closer look at the specific relationship points out that product knowledge transfer is more positively related to sharing culture and sharing trustworthiness. Ambiguous knowledge transfer is more positively related to adaptation culture and adaptation trustworthiness. Expert knowledge transfer is more positively related to sharing culture and sharing trustworthiness but also to adaptation culture.

According to Szulanski (1996), the necessary conditions for the transfer of knowledge include specific characteristics of the knowledge transferred and the transfer situation. The characteristics of the knowledge transferred revolve around the perceived usefulness of the knowledge. Causal ambiguity or lack of evidence showing particular knowledge to be effective hinders knowledge transfers. More so, the perceived reliability of the quality of knowledge possessed by the source, affects knowledge transfer (Szulanski, 2000). The results of the study very truly reaffirm the above findings.

Transferring complex and causally ambiguous knowledge requires reconstruction and adaptation at the receiving end (Attewell, 1992). The findings emphasize that ambiguous knowledge transfer requires more of adaptation guarantee. One may be unwilling to transfer knowledge that is confusing and unclear; unless they are assured that such knowledge is valued and believed by the recipient. Use or adaptation of knowledge may be one such assurance to the transferor.

The product knowledge transfer and the expert knowledge transfer are perceived to occur significantly more in sharing culture and when sharing trustworthiness exist. The apparent reliability of the source of knowledge and the perceived value of the product knowledge could be the reason for enhanced transfer of such knowledge. People more readily adapt such knowledge. However, such knowledge is perceived as the source of power. People thus are unwilling to share such knowledge. More so, if they perceive that sharing of expert knowledge or product knowledge would deprive them of their value and status in the organization. Thus, it becomes essential to have sharing culture and sharing trustworthiness for transfer of such knowledge. However, expert knowledge transfer would also require adaptation culture for its effective transfer.

Constant *et al.* (1994) found that sharing of expertise was not influenced by organizational norms of ownership. Rather, it occurred because sharing provided personal benefits. Sharing of what they possessed personally made them feel needed, wanted, and appreciated. Similarly, Thibaut, and Kelley's (1959) social exchange theory supports that individuals are willing to define their interests and goals as same or similar to those of the organization's, as long as they gain resources and status from their organization. This emphasizes that culture that appreciates the experts, makes them feel wanted, and needed is required to enhance sharing of such knowledge.

Staples and Jarvenpaa (2001) argued that individuals attach organizational property rights less to expertise than to product knowledge. Since information products are more discernible than expertise, it might be easier for an employee to gain confidence that the organization would reciprocate the exchange of an information product. The same confidence might not exist with expert knowledge. The results do not support the above conclusion.

In the study, the employees have rated knowledge transfer in their organization in light of the organizational culture, and trust experienced while working. This method largely captures knowledge transfer as perceived. However, further exploration is not done to explore whether such perceptions are true. No actual measurement of the level of knowledge transfer is done. There is a possibility of perceptual errors. The two independent variables 'Trust' and 'Culture' though are conceptually two different constructs; they may not be perceived as mutually exclusive. High trust may lead to culture of sharing or a culture of sharing may develop trust. The high coefficients of the study may be due to this characteristic of the constructs.

The results of the study largely endorse the perception and the experience of the employees regarding the effect of trust and culture on knowledge sharing. However, the readers are advised to be careful in generalizing of the findings since the study was conducted on a small sample.

CONCLUSION

In today's knowledge economy, the demand for knowledge workers is so high that most of the efforts to retain talented and knowledgeable employees go waste. Therefore, intelligence lies in retaining the knowledge possessed by them. The challenge is in designing an effective organization culture and practices to capture tacit and explicit knowledge. The challenge is effectively transferring knowledge from the highly mobile stars of the organization to the solid citizens of the organization.

Getting the horse before the cart is a challenge in today's highly mobile workforce. Since sometimes knowledge reaches the door precipitously, before its full value to the organization has been ascertained. By the time, the organization realizes, that valuable knowledge (usually in the form of people with particular expertise, tacit knowledge, relationships or understanding of internal process) is migrated elsewhere; it is too late to do any thing about it.

This study is perception-based, where the perception of employees about the role of trust and culture as factors affecting individuals' willingness to transfer knowledge (sharing and adaptation of knowledge) is the focus. There is a possibility of same source bias as the data for both independent and dependent variables have been collected from the same respondents. The data could not be gathered through other methods like observation or critical incidence technique. The respondents for both the independent and dependent variables were same.

Further, empirical research could be done to study other factors that affect knowledge transfer e.g., individual personality variable such as recipient absorptive and retentive capacity, communication skill of the transferor, etc. Future research could also look at other organizational conditions that facilitate knowledge transfer. The characteristics of knowledge to be transferred could also be further explored.

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ANNEXURE

Table 1: Overall Correlation Matrix with Mean, SD and Reliability Coefficients

	Mean	SD	1	2	3	4	5	6	7
Adaptation Culture	11.96	1.78	**(0.55)**	–					
Sharing Culture	25.95	3.69	0.40	**(0.65)**					
Adaptation Trustworthiness	10.58	2.13	0.45	0.55	**(0.53)**				
Sharing Trustworthiness	17.55	3.26	0.55	0.50	0.62	**(0.76)**			
Ambiguous Knowledge Transfer	38.07	5.92	0.47	0.32	0.41	0.34	**(0.81)**		
Expert Knowledge Transfer	20.54	3.80	0.49	0.47	0.45	0.57	0.49	**(0.72)**	
Product Knowledge Transfer	20.75	3.72	0.51	0.64	0.52	0.60	0.49	0.65	**(0.72)**

N = 125; All correlation coefficients are significant at 0.01 level.

Table 2: Multiple Regression Analysis for the Dependent Variable: Ambiguous Knowledge Transfer

	B	SE B	Beta	T Sig.	T
Adaptation Culture	1.19	0.32	0.36	3.69	0.00
Sharing Culture	0.11	0.16	0.07	0.68	0.50
Adaptation Trustworthiness	0.65	0.30	0.23	2.17	0.03
Sharing Trustworthiness	-0.07	0.20	-0.04	-0.33	0.74

Multiple R: 0.52, R Square: 0.27, F: 11.10, Sig F: 0.00.

Table 3: Multiple Regression Analysis for the Dependent Variable: Expert Knowledge Transfer

	B	SE B	Beta	T Sig.	T
Adaptation Culture	0.44	0.19	0.21	2.36	0.02
Sharing Culture	0.20	0.09	0.19	2.17	0.03
Adaptation Trustworthiness	0.09	0.17	0.05	0.55	0.58
Sharing Trustworthiness	0.39	0.12	0.33	3.33	0.00

Multiple R: 0.63; R Square: 0.40; F: 20.10; Sig. F: 0.00.

Table 4: Multiple Regression Analysis for the Dependent Variable: Product Knowledge Transfer

	B	SE B	Beta	T Sig.	T
Adaptation Culture	0.37	0.16	0.18	2.30	0.02
Sharing Culture	0.41	0.08	0.41	5.26	0.00
Adaptation Trustworthiness	0.10	0.15	0.05	0.63	0.53
Sharing Trustworthiness	0.30	0 .10	0.26	3.00	0.00

Multiple R: 0.73; R Square: 0.53; F 34.20; Sig. F: 0.00.

Case Study

Efficacy of Integrating Corporate Social Responsibility and Procurement Strategy
A Case Study of Leading Cotton Textile Manufacturing Company in India

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The idea of corporate social responsibility (CSR) is not something new for the corporate world. However, in the recent past, there has been a shift as far as understanding and implementation of CSR is concerned. CSR rather than being a philanthropic activity has started being looked at by the modern day managers as an integral part of the business proposition itself. In the era of globalization and cut-throat competition, it is not possible to spend on anything which does not make business sense. This paper takes the case of an Indian Textile Company, which in association with a university, banks, and competitors has taken a major initiative in the area of CSR. The program has been helping the hapless farmers of the Indian state of Punjab. At the same time, it makes a huge business sense for the company itself in the long run.

CORPORATE SOCIAL RESPONSIBILITY

The idea of Corporate Social Responsibility (CSR) is as old as the corporate itself. However, the meaning scope and focus areas have undergone a change with changing times, from shareholders to the stakeholders to corporate citizenship. Friedman (1970) would always insist that the only responsibility that the firm has is, towards its shareholders. However, most of the others would not agree with it especially when there is a huge shift of economic power from the states to the corporations[1]. Profit maximization or for that matter wealth maximization is no more the only criterion for evaluating a business. This is an established fact that business has an obligation to the society that extends beyond its narrow obligation to its owners or shareholders. It is viewed these days that it is not only the shareholders, but also, the different stakeholders that the business has to take care of. This is what is called as the basic

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1 As per OECD 51 of the largest 100 economies are corporations and not the nation states (1991).

premise of Corporate Social Responsibility. Corporate Social Responsibility (CSR) is a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis. There has been a long debate on this issue and there seems to be a consensus on the idea that business firms have to look beyond its shareholders. The firm has to identify its stakeholders and it has to look after the interest of the different stakeholders.

The idea of Corporate Social Responsibility seems to be gaining popularity amongst both the researchers as well as the corporate entities. Corporate sector has started reporting their initiatives as well, though in different formats. More than half of the Fortune 1000 companies issue CSR reports (Tsoutsoura, 2004). Similarly, the researchers have ventured into this area with a great zeal of interest and have produced many studies covering different aspects of CSR in different sectors and different situations.

Different studies seem to address three broader issues viz. what is the quantum of social initiatives taken by different companies, what are the reporting practices (and quality of these) of the corporate sectors regarding their CSR initiatives and what is the relationship between financial performance and social performance (if any) of the corporate sectors. There have been various studies, which focused on different aspects of CSR. The areas that have been primarily researched by different researchers are–measuring the corporate social performance, reporting practices of the corporate sector pertaining to their social initiatives, and establishing relationship between the corporate characteristics like size, profitability and industry.

BUSINESS CASE FOR CSR

The most important area of research has been to identify if there is any relationship between corporate social performance and certain corporate features as well as certain financial indicators. According to Margolis and Walsh (2002) there have been 122 published studies between 1971 and 2001 to examine the relationship between CSR and financial performance. Gray and Milan (2002, 2004) have attempted to establish a link between the CSR disclosure and certain corporate insights, such as size, profitability, etc. Waddock and Graves (1997) and McGuire *et al.* (1988), found interdependence between financial and social performance. However, their conclusions were questioned by McWilliams and Siegel (2000). Another study conducted in Australia suggests that it pays to be moderately and socially responsible rather than be overly concerned with social responsibility involvement (Mangos and Peter, 2000). However, the results of different studies have been inconsistent with each other. For example Wright and Ferris (1997) found a negative relationship; Posnikoff (1997) found a positive relationship and Teoh *et al.* (1999) found no relationship between the CSR and short run financial performance. Similarly, Cochan and Wood (1984) located a positive relationship, Aupprele *et al.* (1985) detected no significant relationship and Waddock and Graves (1997) reported a positive relationship between CSR and some long-term financial indicators. Another area of research in CSR has been to understand it from the stakeholders' perspective. It has been argued by a group of authors that paying attention to the interests, needs and rights of multiple stakeholders of a business is a useful way of inculcating socially responsible behavior among corporations (Goodpaster, 2001; Greenwood, 2001; Ruf *et al.*, 2001; Dawkins and Lewis, 2003; and Maignan and Ferrell 2004). Freeman (1984) distinguishes between primary stakeholders (owners, management, local community, customers, employees and suppliers), and those whose continuing participation is necessary for the survival of the corporation, and secondary stakeholders (the government and communities that provide infrastructure and markets, trade unions and environmentalists), who are not essential to the survival of the corporation although their actions can significantly damage (or benefit) the corporation[2]. A point to ponder is what exactly works on the minds of corporate managers while making such CSR initiatives. Is it the financial implications or philanthropy or some other motivating aspects. The literature suggests various motivating forces driving the corporate to invest in the social sector. Social responsibility can be used as a strategic tool to enhance the reputation and the public image of the company (O'Brien, 2001), while at the same time, prove to be profitable for the company. Companies have been found to increase their ability to attract and retain their employees with a strong CSR commitment (Turban and Greening, 1997). Gnyawali (1996) suggests that a combination of firm specific, country specific and global factors shape the corporate social performance. Corporate is also viewed as the social communities that serve as the mechanisms for the creation and transformation of knowledge into economically rewarded products and services (Kogut and Zander, 1993).

STRATEGIC CSR

If in the recent writings and the information available is any evidence, the CSR investments or CSR initiatives are not merely discretionary or philanthropic activities. The changing business scenario and the pressures put by the globalization would perhaps not allow the corporate to invest on philanthropic activities to a great extent. Coupled with this, the corporate is under pressure to be socially responsible. In fact, the business case for sustainability has been highlighted by many among others (Bonifant *et al.*, 1995; Dechant and Altman, 1994; Hart, 1995; Porter, 1987; Porter and Linde, 1995; Shrivastava, 1996; and Zadek, 1999). Recent times have given rise to terms like social entrepreneurship (Seelos and Mair, 2005) and strategic CSR (Porter and Kramer, 2006). These concepts signify the fact that if the corporates have to be socially responsible, they have to make social investments or take social initiatives, which makes business sense too. What distinguishes today's understanding of CSR from the initiatives of the past is, the attempt to manage it strategically and to develop instruments

[2] Cited from Dusuki, Asyraf Wajdi and Humayon Dar, "Does Corporate Social Responsibility Pay Off?" http://mubs.mdx.ac.uk/conferences/bpcsr05/03_measuring_csr/CSR%20Paper%20_Asyraf%20Dusuki_.pdf (visited on June 12, 2006).

for this. In the competitive business scenario only those corporate social initiatives will make sense, which in one way or the other is integrated into their business models of the companies. Any social investment/initiative, which is bereft of any link with any business preposition, cannot be long lasting in most of the cases. Porter and Kramer in a very recent writing (2006) would strongly suggest that it is probably high time that we stop treating business success and social welfare as a zero sum game. According to them strategic CSR moves beyond good corporate citizenship and mitigating harmful value chain impacts to mount a small number of initiatives whose social and business benefits are large and distinctive. There are numerous examples of strategic CSR available like Toyota, Urbi, Microsoft, Nestlé, etc. (Porter and Kramer, 2006). Nestlé India operations (in Moga in Punjab) case has been highlighted by Porter to stress upon the fact that the companies have to integrate social responsibility in the business models itself. The paper takes a case of another Indian company to further the argument of Porter and Kramer (2006) that many opportunities to pioneer innovations to benefit both society and company's own competitiveness can arise in the product offering and the value chain. The current paper highlights one such case where, a company uses its resources to help the farmers grow cotton efficiently so that the farmers get their revenue and the company is able to satisfy its raw material requirements locally.

STRATEGIC CSR: CASE OF AN INDIAN TEXTILE MANUFACTURING COMPANY

India primarily is an agrarian economy and Punjab state is one of the leading states in the agriculture sector. Agriculture is the mainstay of Punjab's economy where 97% of total cultivable area is ploughed and about 75% of the population depends on agriculture. Punjab state possesses 1.55% of geographical area and 2.6% of cropped area of the country. The state produces around 24.72 Million tons of food grains, which is very good by Indian standards. The state is known as the food basket and granary of the whole country. The main crops of Punjab are rice, wheat and cotton. In fact, cotton holds a very significant position because of its relevance for the industrial economy of the country. There is an area within Punjab known as Malwa region for which the primary crop is cotton because of its tropical conditions. Some other features of this region are small land holdings, low level of education and high degree of dependence on agriculture. Punjab also has its share of industrial units of the country. One of the leading textile companies of India has its main production facility as well its corporate office in Punjab. That fact also enhances the significance of cotton growing and its role in agriculture and industrial economy of the state. However, the cotton scenario in this part of the world has not been motivating in the recent past. The state contributes just 7.5% (2004-05)[3] to all India cotton production, which looks incredulous. Moreover, it's a very high figure as compared to the year 1998-99

[3] The figures are as per Government of Punjab records.

figure when it contributed merely 3% of All India production. Nevertheless, in the past, Punjab used to be the number one contributor and in 1991-92 its contribution to All India production was 19%. In fact, from 1989 to 1993 Punjab was the number one in India as far as cotton productivity is concerned. But, it slipped down in the ranking of cotton productivity. In fact, the real ordeal of cotton growers in Punjab started from the year 1997-98 when their fields were devoured and destroyed by what is called as American Bollworms, consequently, putting them into deep debt traps. They were losing their crops year after year and the fury continued till 2002. Farmers in this part of the world are proud of their dignity. As moneylenders came knocking their doors, the cotton growers could not hide their shame and some of them committed suicide also. In fact, this was a multifaceted problem. The cotton production went down and resulted in the decline of the cotton area from seven lakh hectares in early 1990s to five lakh hectares in late 1990s. Secondly, it brought an era of pesticides, consequently increasing social, economic and ecological costs. Though the last two years have been better for cotton growers in Punjab, yet the cotton scenario is not very pleasing. The problem is two fold viz. the yield and the quality of cotton. In Punjab the cotton productivity has been hovering around 300 kg per hectare during all these problem years. However, it has improved to 584 kg per hectare in 2004. Still it is far lower than the world's average cotton yield which is 721 kg per hectare (2004-05). Further, the yield of leading cotton producing countries e.g., China, America and Australia is 1,119 kg, 951 kg, and 1,803 per hectare. The amazing part is that, the yield has been 780 kg/ hectare in the neighboring country Pakistan which has the same agro-climatic conditions. That indicates clearly that there is something, which has gone wrong with the cotton growing in this part of the world, which at some point of time was known as the cotton bowl of India.

THE COMPANY

The company is a major integrated textile producer in India. It was setup in 1962 at Ludhiana, a major city in Punjab Province in Northern India and is today, perhaps, the largest textile conglomerate in India with a turnover of Rs. 1,913 cr. (US$ 439 mn) during 2003-04. As per the mission statement, the company aspires to be counted among the top class textile organizations by way of achieving customer delight and by way of its commitment to be a responsible corporate citizen. The product portfolio includes manufacturing and marketing of Yarns, Fabrics, Sewing Threads and Fiber and cotton is the primary raw material for most of the products. The company has an installed capacity of 5.5 lakh spindles. The company has been procuring cotton from the local farmers only.

THE PROGRAM

Vardhaman being the leading textile company in the region had to face problems because of the non-availability of raw material locally. Mr. S P Oswal, the Chairman and Managing Director of Varadhaman Group would often wonder as to what is wrong with cotton growing in Punjab. The most disturbing thing for him is the very low productivity not only in Punjab but, all over India. Indian cotton yield is one of the lowest, whereas it has nearly 25% of the global cotton area. Indian yield is 378 kg per hectare as compared to 620 kg per hectare of the world average. According to him, India loses roughly Rs. 11,000 cr. annually on account of the poor yield. Not only this, but also the cotton which comes to the market for sale is too contaminated to use for industrial purpose.

The CMD has had the habit of visiting *Mandis* (grain markets) from where the company buys cotton. One fine day, he visited one of the markets and one of the commission agents (the ones who buy the crop from farmers and sell it further) told him a story of a farmer (Mr. Surinder Pal Singh) of the region who was reporting a yield of around 800 kg per hectare. That was amusing and shocking for the CMD. He was keen to know the truth because this has never been heard of before in this part of the world. To his amusement the information was absolutely right. He decided to meet the farmer to know what makes him different from the others. The farmer was quizzed many times by the team of experts. It was revealed that, it was possible for the entire region only if the farmers had the right information and used it. However, information is not available to all the farmers as most of them are small size farmers who cannot afford the information cost. The farmer was rewarded by the company for his achievement.

Phase I of the Program

CMD is a strong believer of Schopenhaur's theory that reality can be changed by sheer force of will. He wondered if the farmer could be presented to the rest of the farmers as a role model and if the farmers can be motivated to go the same way and consequently help them in increasing the productivity. All this led to the conception of the idea of adopting a village and then help the farmers in different aspects of cotton growing. So, a village named Nava Pind under Bathinda district of Punjab state was identified and it was decided to experiment in that village. The aim of the program was decided as "Transfer of technology to farmers' fields for raising productivity and upgrading the quality of cotton of the entire village and also to ameliorate the condition of the cotton grower".

Obviously, this was not an easy task and the company itself did not have many experts at its disposal. Moreover, being a private sector unit winning the confidence of the farmers was not an easy task. This was one of the most important and crucial areas as they were fed up with the representatives of the pesticide and fertilizer companies. So Punjab Agriculture University, Ludhiana (Punjab) was roped in. The CMD was able to convince the cotton and other agriculture experts from the university that the program made sense and together they would be able to make the difference. The university people agreed to it and they decided to participate in the program. And they assumed that the experts sent by the company are just one of them who were there to sell something. In order to tackle this problem the Department of Agriculture, Govt. of Punjab was also roped in to make it more meaningful.

The farmer, Mr. S P Singh was presented before the village to showcase a success story. This helped in winning the confidence of the farmers. The first phase of the program was to identify what ails the cotton growing in India and specifically in Punjab. A detailed profile of the all the farmers of the village was prepared and studied. After a detailed survey, the following areas were identified as the causes of low yield:

- Lack of awareness among the farmers about the improved and modern techniques to be adopted to increase the yield of cotton.
- Herd mentality and casual approach of the farmers.
- Lack of reading, listening and noting down habits.
- Obtaining low-level of yield mind set.
- Availability of poor quality inputs.
- Too much dependence on the moneylenders and commission agents.
- Indiscriminate use of pesticides.
- Scant care on the quality aspect of cotton.

Apart from the technical reasons, the most important area of concern was the farmers' dependence on private moneylenders. Because, the farmer would take loan from the moneylenders or the commission agents, he would probably follow their advice as to which seed and what pesticide in what quantity to be used. To take care of this problem, one of the leading banks, Punjab National Bank was also brought in so as to take care of the financing needs of the farmers by providing them easy loans against the cotton crop. And those farmers who would act according to the directions provided by the program committee would have the higher probability to increase the yield and a higher probability to return the loan. The idea for adopting this village was to develop it as a showpiece by implementing participatory and sustainable approach for cotton farmers and by arranging for them all the information, inputs and services they needed to enhance cotton production and to cut their cost of cultivation, at their doorstep. The said experiment was a great success as this village joined the elite club of the world by producing 24 Md. per acre of cotton or 792 kg per hectare of lint cotton.

Phase II of the Program

Motivated by the success of Nava Pind, the company motivated other textile companies of the region to join the program so that the experiment could be extended to more villages. It resulted into Vardhaman led consortium of leading spinning mills of northern India along with State Bank of Patiala. Participating mills of consortium other than Vardhaman Group were Nahar Spinning Mills Limited, Trident Group, Aarti Spinning, Winsom Group, JCT Limited, and Gounterman Spining, apart from two banks namely Punjab National Bank and State Bank of Patiala. The idea behind including State Bank of Patiala and Punjab National Bank into the consortium was to take care of the credit needs of "genuine farmers" of these adopted villages by way of making available hassle-free loans on easy terms to them.

This consortium adopted ten villages in 2004-05. These ten villages were put into two clusters namely Bathinda and Muktsar clusters. The program was a huge success and it also won great accolades as the average productivity of all the adopted villages got doubled than that of the last year, which in a way was a great achievement. The success of the said village cluster adoption programme also found mention in His Excellency, President of India, Dr. A P J Abdul Kalam's address to the nation on May 11, 2004 on Technology Day broadcast over the All India Radio and on January 25, 2005 on the eve of Republic Day relayed on Indian TV. So much so, that H E Dr. Abdul Kalam himself congratulated Sh. S P Oswal (Chairman, Vardhaman Group) by sending him a letter on April 1, 2005 appreciating the efforts of the consortium. Such has been the success of this drive that the farmers of the surrounding areas have approached Vardhaman led consortium to adopt their villages.

Phase III of the Program

Motivated by the two consecutive years of success of the village adoption program, and in order to further carry forward the good work of previous years, the consortium in the year 2005-2006 adopted 25 villages in five clusters in the Malwa region of Punjab. Fairly speaking, enthusiasm from farmers is helping the consortium to rapidly scale up its network. The consortium plans to adopt 500 more villages, or one tenth of the cotton villages, within next five years in Punjab. The 20 villages have been put into five clusters falling under four districts of Punjab namely Bathinda, Faridkot, Mansa and Muktsar, selected to represent the different agro-ecological conditions of Malwa region of Punjab. Each cluster comprises five villages at least, generally located within the same agro-climatic zone, and with a total population of about 600 farmers per cluster. The clusters are generally 15 to 20 km from the nearest towns and 70 to 75 km from Bathinda, from where the Controlling Office of the cluster project is operating. The sole idea behind Cluster Adoption was to speed up the dissemination of the best practices for cotton because of pervasiveness of demonstration effect to the adjoining villages/blocks. Every village will have a full time Scout and every cluster will have cluster in charge to which the scouts will report. (see Appendix for details). The consortium expects the cotton productivity to improve leading to the upliftment of the socioeconomic status of the farmers and at the same time providing the much needed raw material to the mills in the consortium.

CONCLUSION

The idea of CSR is as old as the corporate itself. However, the meaning, motivations and drivers of CSR have been redefined time and again. CSR as a philosophy has traveled a long way from being merely philanthropic activity to something as an integral part of business philosophy as such. The globalization and increasing competitiveness have forced the managers to be more focused on profit generation which can be achieved by cutting the cost wherever possible. When facing a crunch situation, a manager is more likely to cut on the activities and costs, which are discretionary in nature. CSR has been viewed as an absolutely discretionary activity. However, on the other hand the rising consumer awareness, social consciousness, and NGOs etc., demand the business organizations to be socially more active than they are or they were. This calls for striking a balance between profit orientation and social orientation. The wiser managers in recent times, with a view to strike a balance between profit making and social responsibility, have tried to find innovative ways to integrate the very idea of CSR into their business activity. That means, identifying the initiatives which make both business as well as social sense. The case of the Varadhaman is one such example where the company has tried to launch a social initiative, which makes a very good business sense also. The company in question (and its competitors who joined later) need raw material, which can be made available locally by the farmers who have been growing cotton for years but, have fallen to the natural as well as man-made calamities. If helped, these farmers can produce something which is required by the company. Punjab Agriculture University (PAU) exists to help the agriculture grow. Never forget it was PAU, which was one of the responsible factors for the Green Revolution in Punjab. There is a bank (two banks later), which is in the business of lending money but needs some reassurance before it decides to lend money. There is the Confederation of Indian Industry (CII) which has as one of its objectives to help the industry, in the way it can. There is a state which seems to be clueless as to what has been happening as far as the state of cotton cultivation is concerned and always look up to industry or someone else to do something to get it back on track. And there are farmers who need monetary and technical help along with an assurance that their product will be bought by someone at a competitive price (if it is of right quality). Here is an opportunity where the company has tried to launch an initiative, which brings all the stakeholders together for something, which can be termed as win-win situation. The company (or the companies) would get the raw material they need and the cost of the initiative would be set off against the cost saving which it is going to get from locally available raw material than buying it from other states. The point to be noted here is that it is not contract farming rather, farmers are free to sell their crop wherever they want to sell. The PAU does what it exists for, promoting the agro products. Bank gets business with a relatively more amount of reassurance than what it has if it does not participate in the initiative. CII is happy to do whatever it can for the industry and chief minister is happy to see something being done by the corporate, which should have been done by state.

The case highlights the point that in the days of competition when activities like CSR are considered to be undesirable but are unavoidable at the same time because of the social groups, it would be more sensible for the mangers to identify the areas where the social initiatives can be taken and how those initiatives serve the business purpose also. The case can be motivating for others who look for integrating CSR into their business models as such. The concept of this mission was inspired by none other than Vardhaman's dynamic and visionary Chairman, Shree S P Oswal. As a philanthropist, he believes that enriching the farmers' community is not about charity but a fundamental responsibility. CSR is not about charity but it makes good business sense and goes on to increase the value of the organization. Over time when all stakeholders benefit the company is a 'winner' in the industry.

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ANNEXURE

Village Adoption Program Aim of the Project

Transfer of technology to farmers' fields for raising productivity up-grading the quality of cotton of the entire village and also to ameliorate the condition of the cotton farmers.

Thrust Area

- Accustomed to obtaining low cotton yield, farmers of Punjab have harbored a strong belief that "Nothing can be done to increase" the production of cotton and are fully dependent on destiny and vagaries of weather. Therefore, the first and formidable task is to change this mind set of farmers. Introduction to recommended practices and latest scientific techniques of farms practices i.e., integrated crop management (involving both agronomic and crop protection) for cotton growers at their door-step.
- Training program for farmers through group meetings as well as through the spread of technical literature prepared by the participating mills and State Bank of Patiala with the help of Punjab Agriculture University. In other words, making available expert guidance and advice from time to time during the season for raising a good crop.
- Arranging Visits in small batches of farmers to cotton research stations, to give them an exposure to modern farming techniques and latest developments of cotton research.

ANNEXURE

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Village Adoption Program Aim of the Project

- Propagation of IPM Techniques—which is not only cost efficient but also very effective in minimizing losses.
- Adoption of biological methods such as the use for Pheromone Traps, Tricogramma Cards, Light Traps, etc. may be stressed.
- Holding an awareness program for producing contamination free cotton at field level in which experts from Punjab Agricultural University and Vardhaman will explain to farmers the various measures to be taken for clean picking, storing and marketing of clean seed cotton.
- Developing a habit among cotton growers for noting down each and every expenditure to be incurred on the crop, which in turn will help them to have a look on their cost and returns.

Criteria for Selection of Villages

While selecting the villages, following things were taken into consideration:

- Psychology of the village folks;
- Response level of the villagers;
- Awareness level about cotton crop among villages;
- Assessment of the potential cultivable area and yield of cotton;
- Distance from Bathinda (control point);
- Distance from PAU regional stations Bathinda and Faridkot; and
- Concurrence of participating companies, State Bank of Patiala and Punjab National Bank.

Farmers' Field School

This is one of the most important features of the program. Every adopted village now has a farmers' field school. Here, the concerned incharge and the scouts impart education to farmers of the villages on almost a daily basis. For this purpose a mini library has been set up in all the field schools of the adopted villages of all the clusters. Books, magazines based on agriculture are kept here for the education and knowledge of the farmers. Other defining feature of the farmers' field school is that, the farmers of a village discuss their problem relating to their crop and accordingly, try to solve by themselves with the help of a scout who is adequately trained by the experts. In case, they don't get the solution, the query is referred to the visiting experts for suggesting solution. It may not be an exaggeration if it is claimed that farmers' field schools have ignited fire in the belly of farmers to know more about the cotton crop cultivation. In case of an emergency, farmers can directly approach the concerned Agriculture Experts over phone as the phone numbers of experts are displayed in every school.

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ANNEXURE

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Village Adoption Program Aim of the Project

Staff and Farmers Training

In view of the innovative nature of the project, training is the key component. All the staff are trained in a participatory approach to the development as well as with the technicalities of the cotton crop right from the start of the project, and this continues throughout the project. A good number of farmers will be trained on technical aspects of cotton at PAU research station of Bathinda and Faridkot. Familiarization visits by officials particularly from the mainline organization, in order to give the benefit of their experience and to provide an opportunity for them to learn from the innovative approaches that will be going on in the project. Such visits are important at the time of expanding and replicating the project in other villages at a much larger scale.

Liaison Officer

A full time officer has been hired who is a B.Sc. (Agriculture) with sufficient experience and has been entrusted with the job of liaison with PAU, Department of Agriculture, Punjab, Extension Department and other Research Agencies.

Cluster InCharge

One Cluster Incharge is supposed to cater to the cluster comprising five villages. Minimum qualification of the Incharge is B.Sc. (Agriculture) plus six months practical experience of cotton growing. In fact, cluster Incharge is a very important link in the village cluster adoption project. Each cluster Incharge will have five scouts under him. Cluster Incharge will be directly responsible to supervise the activities of the scouts and getting the field work done from them in the adopted villages. Cluster Incharges will generally have their operating office at the hubs of cluster. Each cluster will have one hub (centralized place), and the cluster Incharge is supposed to have loads of patience, good persuasive and coordinating skills, missionary zeal and project based thinking.

Duties of the Scouts

The duties of each scout are:

- To visit on a daily basis about 8-10 cotton farmers of the village and to have complete details of the village like:
  a. Total Area of the Village.
  b. Total Population.
  c. Area under cotton cultivation.
  d. Area under other crops.
  e. Specialty of village.
  f. Number of farmers with name and land under cotton cultivation.

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ANNEXURE

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Village Adoption Program Aim of the Project

g. Seeds sown with date of sowing.
h. Irrigation details.
i. Fertilizer and pesticide application.
j. Last year productivity.
k. Date of picking.

- To guide and help the farmers in arranging the inputs like supply of quality and genuine seeds, fertilizer, pesticide, etc.
- To be liable for insuring IPM practices on cotton crop.
- To properly understand the problems related to cotton and will accordingly contact the agriculture experts for arranging experts' visits for providing solutions to the farmers.
- To be responsible for imparting training on good storage and transportation practices to the entire family of the farmer in order to tackle the contamination of cotton.
- To be responsible for giving training to all cotton pickers. He will exhibit good conduct and will also be utilized for mass contact for holding group meetings in the villages.

Apart from this the following facilities/efforts to be directed towards farmers:

- Soil testing, micronutrients of soil testing and water testing are arranged on free of cost basis for the farmers.
- Demonstrative trials of seeds have been arranged in these villages.
- Arrangements have been made whereby complaints of farmers related to cotton crop are to be attended to within 24 hours of receipt of the same.
- In an effort to minimize pesticide, trials for bio-control agents will be arranged.
- Free of cost testing of Bt Cotton seeds will also be done. For this purpose, Department of Agriculture, Govt. of Punjab has promised to provide Bt Cotton seeds' kits.
- Efforts to be made to ensure timely canal water to adopted villages.
- Each and very farmer of the adopted village to be provided with books on techniques of cultivation of cotton, procedure for surveillance of major cotton pests, *Bahi Khata,* and how to control foreign matter contamination in cotton etc.
- In order to instill confidence, the visiting scientists will not confine their advice to cotton crop only, but also guide farmers about other crops/allied activities.

Awards

In an effort to generate competition among farmers of adopted villages and scouts, it has been decided that at the end of the cotton season one village from each cluster will be chosen on the basis of productivity and will be awarded. Moreover, one farmer from all the villages with best productivity will be awarded along with the scout associated with the village which the farmer belongs to. The awarding ceremony is the responsibility of the Confederation of Indian Industry (CII).

Book Reviews

Leadership Magic: Practical Tools for Creating Extraordinary Organizations

By Ben Valore-Caplan

Jaico Publishing House, Mumbai, ISBN: 8179922863, Pages: 217, Price: Rs. 795

Leadership is the process of influencing an individual or a group of persons. It is the quality of a person to lead, to guide, to motivate, to build, to persuade, to direct the team towards a set of goals. There is a popular saying, "It is easier to be said than done". A leader can direct or guide the followers by giving instructions like do that, don't do this, follow this, practice this, etc., but to make them work, it is very difficult. It requires leadership magic to persuade, to inspire the followers and take them along with the leader for the achievement of organizational goals. This book helps the leaders to acquire the magic. The author starts with a small introduction about why he has chosen this topic and how it is useful for leaders. The whole book is divided into four parts (Purpose, People, Process and Performance). For each section he narrates a story, which is related to the topic, enabling the reader to acquire an idea about the particular topic and interrelate it to others.

PURPOSE

The author starts the section by quoting that an organization without purpose drifts like a ship without rudder. Leaders have to motivate people as well as organizations to create, align and commit themselves to their mission.

ALIGN MISSIONS

By aligning the mission, the employees can be inspired to contribute the best towards organizational goal attainment. With small examples, he illustrates how to design a mission, which stands distinct from other organizations.

TEACH LEADERSHIP

Leaders should not only guide but also teach leadership to enable the employees to lead themselves as well as the organization. The effective leader should create opportunities for learning, give constructive feedback which enables the employees to develop their skills and correct their mistakes, and strategically ask questions which make the people more responsible for their work. Leaders should increase the confidence level of resistant people and change their attitude and convert them to productive people.

PEOPLE

By aligning mission but without proper coordination or cooperation of the members, the ship cannot reach its destiny. Members should trust, interact, and build relationships with each other for a safe journey and to reach the destination. Once mission is aligned, leaders should help people to build trust and leverage diversity to strengthen the relationships. This in turn elicits organizational magic by creating an environment favorable to people who learn from mistakes and contribute their best to achieve the mission. The author explores relationship models and relationship synergies to nurture relationships between persons.

POWER OF RELATIONSHIPS

Leaders have to take care of others, while their followers take care of each other, through which the organization takes care of its customers, suppliers and investors. Leaders have to empathize to know others' feelings, thinking and perceptions. Caring and empathy lead to building trust. All these three strategies help the organization to build cohesion among employees, enable free flow of information, and build better relationships.

LEVERAGING DIVERSITY

To tackle the diverse people and bring out the inner potential, strategies like communication through different modalities, value experiences and creation of diverse teams have to be followed by the leader. The author elucidates the comfort zone philosophy to create a powerful cycle. He elucidates that the comfort zone model can be a valuable tool for leaders who want the organization and people to work together to bring out the best in everyone. Leveraging diversity and other leadership skills examined here demand that people setup and practice these skills themselves. Leveraging diversity benefits the organization in terms of improved participation, more learning, continuous improvement, better performance, greater understanding, more effective collaboration, and stronger relationships.

PROCESS

Now the ship is in the midst of a storm. The crew members were arguing with each other with conflicting ideas about the strategy to be followed to overcome the blasting wind and ripping rain and to reach the destination safely. The captain uses a magic to negotiate the conflict and get the work done. In the organization, in the process of attaining goals, many conflicting ideas arise among the people. A leader has to create magic when he attends to the processes through which people communicate with each other and negotiate conflict.

COACH COMMUNICATION

The author emphasizes the nurturing of relationships through communication. He suggests four magical listening strategies like silence internal voices, send listening signals, reflectively listen and create a listening filter. He also suggests tools for improving communication. To attain organizational development, effective communication is essential, for which good listening skill is important, and the leader should take the initiative of developing that skill among employees.

NEGOTIATE CONFLICT

Leaders who appreciate the value of conflict, set ground rules to create a safe environment for handling the feelings that can arise when people disagree with each other. 'Conflict can be an organization's greatest opportunity. Without it there is no magic' (pg. 145), says the author. Organizations that can withstand and learn from the conflicts reach greater heights. He says that a leader should teach people the constructive strategies for approaching conflict by being an excellent example by himself. The leader must make them recognize that in spite of their differing ideas, their goal is to get similar results, which helps them maintain the respect they have for each other. The author suggests four-quarter model (Data: State what happened→Describe the Judgement that he or she has formed about the other person's intentions→Share feelings in response to the situation→Want: ask what they want) for negotiating conflicts.

The author's illustration of the model with practical examples is exemplary, and enables the people to understand it better. "Conflict has the power to help, create a magical organization to destroy it from within," says author. (pg. 162).

PERFORMANCE

The ship cannot afford to depend upon one person, so the wise captain created a ritual that would build bonds between the crew members. At every shift change old shift members and new shift members met each other and old shift members shared their experiences of the condition of the ship and course, which helped the new members to assess and review it and plan it accordingly for a safe journey. Magic emerges from the combined energies of people coming together around the common mission and making it a reality. By acting deliberately and thoughtfully people can achieve anything.

BUILD RITUALS

Rituals foster positive energy and excitement, and stimulate performance and motivation. To create magic, leaders help people build rituals. Leaders should make the people aware of the organization's mission by displaying it in a public place, bringing the important members of organization gather near the mission statement, making the mission to say aloud, signing it, etc. The author gives an example of Ritual Kudos where at the end of every meeting the members share their views of who generated great ideas, who did something exceptional or something ordinary, or exceptionally well. This gives a sort of satisfaction and energizes the members. Rituals can be powerful tools and when evoked by a leader who is attentive to individual needs, and this awareness can enhance personal performance.

TAKE BOLD RISKS

Leaders have to trust themselves and their intuitions before earning the trust of others. Leaders can develop greater confidence in their inner voices by making affirmations, time leaders spend lot of time by listening, supporting, protecting, serving and meeting others. Thereby they will not be able to hear their own intuitions. By taking time to be alone, they find the opportunity to silence external voices and listen to internal voices) and writing in a journal (it is a process of expressing oneself without fear of being graded which helps them clarify and find greater values in their inner voices). These are the tools for developing trust for oneself. Once he starts looking into his internal voices and builds trust, he will be adept at anticipating and appealing to other people's internal voices. In bringing out a change in the organization, the leaders by not believing in themselves take action only when others around them validate. Fear and isolation can pose powerful obstacles to beginning and must be faced rather than denied. Out of bold risk- taking leadership magic flourishes.

At the end of the book the author makes a note for entrepreneurs by saying, "Beware of the advices people give to concentrate on cash flow and get your name instead of leadership. Implement leadership practices from very beginning of the organization" (pg. 225). At the end of each chapter, self-reflection questions are asked which enable leaders to assess their skills and opportunities for improvement. In each topic guidelines are provided to enable the reader to think intensively and understand the concept better. Executive summary is given at the end of each chapter for a quick glance on what is discussed. Every topic is started with a quotation at the top, quoted by different personalities relating the topic, which makes the reader think. The language used by the author is simple and understandable. It is a useful resource for leaders, managers or whoever lead a group of people in organizations. It will be useful to Management students too in order to get an idea about the concept. A major drawback is that though lots of practical examples are quoted, too much of theory with numerous subtopics is covered which confuses the reader.

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Introduction to Globalization and Business: Relationships and Responsibilities

By Barbara Parker

Response Books, New Delhi (2005), Pages: 523, ISBN: 8178295709, Price: Rs. 680

Globalization, as a catchall phrase has indubitably entered popular dialogue worldwide, carrying connotations ranging from the effusively positive to those bordering on paranoia. Hence, it becomes doubly important to have a meaningful and dispassionate debate on the antecedents and consequences of globalization. Also, it is increasingly being perceived that globalization is driven by business interests rather than national governments. Thus, it becomes imperative to incorporate the role of businesses in any discussion on globalization, for that discussion to be complete. Barbara Parker attempts addressing these objectives in an admirable fashion and succeeds to a great extent in her endeavor. This book, aided by wide coverage of information and extensive references, is primarily intended to serve as a textbook apart from doubling as a resource for researchers.

The book has been penned in an easily readable fashion. A case at the beginning of each chapter helps in focusing the attention of the reader; examples through out each chapter help in elucidating the theory being discussed and ensure that the discussion is kept interesting. The text has a wealth of examples including, for example, the one related to the two major Indian political parties engaging global advertising firms for their poll campaigns. Several examples from developing economies are a definite and great plus. The author draws focus to several unnoticed facts (e.g., preponderance of family firms among global firms) as well as overlooked facts (e.g., globalization of disease) that tie in well with her thesis that globalization is a complex phenomenon.

The author conceptualizes globalization as the intra and inter-relationships between the six spheres of global business and industry activities; natural environment; global culture; global politics; global economics; and global technologies. This is important because it clearly signals the message that globalization is complex and hence needs an understanding of several aspects. While she does not explicitly say so, it is evident that these six spheres are components of Political, Economical, Sociocultural and Technological (PEST) framework, with an added component on natural environment to acknowledge its growing importance in the current world.

The special emphasis on business activities is presumably to separate the macro-and micro-implications while looking at the economic component. The author rightly observes that today, globalization is characterized by four factors, viz., growing interconnections, rapid and discontinuous change, number and diversity of participants, and greater managerial complexity.

Given the propensity of media to use words interchangeably, the author exercises caution in defining and differentiating concepts such as international and global. She argues that an "international" mindset is narrower in scope, concerning itself with individual countries and cross-cultural skills and expertise in functional areas. A "global" mindset, in contrast, concerns itself with the world at large and diversity of management skills and multifunctional expertise. However, she does not achieve the same sort of success in articulating differences among non-domestic businesses with the categorization of businesses as international, multinational, global, transnational—it would have helped to conceptualize this category as a set of supersets and subsets.

Starting off with an introduction to globalization, the book sets the agenda in the first four chapters. Following chapters deal with each sphere of activity. Each of these chapters is written in an extensive fashion. The chapter on global industries covers a wide ground; however, it sometimes just lists the facts rather than analyzing them. For example, the section on company longevity should have thrown light on why longevity is a virtue in these days when mergers and acquisitions happen easily and regularly. The treatment of global economy in two chapters is a masterstroke as "labor" needs a separate and in-depth treatment. Again, more could and should have been said about the perceived biases against free movement of labor, especially in the context of low skilled workers to developed economies, and juxtapose this with population projections till the end of the century. Tying the discussion of Human Development Index (HDI) within the global economy debate is a great service to the student. A surprising omission in global politics is the role of Non-Aligned Movement (NAM) that has over 100 nations as members—it would have been interesting to see how such organizations try to reshape themselves in the post cold war scenario.

Later chapters look at topics that are increasingly important in a globalizing world. The chapter on Corporate Social Responsibility (CSR) and ethics categorizes CSR as not "value-added" but "value-expected"—an elegant conceptualization to capture the argument that CSR is becoming a vital hygiene factor. However no clear distinction between CSR and ethics is attempted by the author. Should CSR be external or internal to the business interests is a question that could have been tackled, by including issues such as affirmative action that defy such easy typecasting. Also, a global firm engaging in CSR in a developing economy may be perceived as influential and as interfering with governance—these challenges should have been touched upon.

While the thesis of interconnectedness in globalization is valuable, the same could have been communicated in different ways. In at least one of the chapters pertaining to a sphere of activity, the author could have tried to show the impact of each of the remaining spheres of activity to drive home the point of interconnectedness. Alternate ways of supplementing the thesis could have been done through either a couple of country-specific chapters (say, on India or China) that capture the challenges of globalization, and portraying the interconnectedness of the six spheres. Historic examples could also have been employed. For example, the text talks of fluctuations in Foreign Direct Investment (FDI)—explanations about why and how globalization declines could be offered from the global trade in historic China (The Silk Route) and ancient India (Spice Trade). Another approach could have been to take a functional area, say marketing or production and see how globalization impacts that area. For example, impact of global culture on family relations holds lot of potential for marketing practice. Due to adherence to a fixed format of writing, the text sometimes reads like a compendium of facts rather than like an analytical piece.

Discourse on and development of alternate theories is rare for a textbook as textbooks are generally expected to be prescriptive and normative. For a text book, it covers a lot of ground, yet omissions abound as well. The whole text would have taken a different hue if the scope was more tightly defined and integrated. Had the text been on "Introduction to Globalization" alone, this could have probably been achieved. Due to equal emphasis given to the "and business" part in the title, some detours on organization structure/strategy are necessary though these do not apply to globalization alone—their importance in a global setting is merely a matter of degree rather than distinction, and hence, do not easily belong in the text. For a book that establishes the need for sensitivity towards other cultures in a globalizing world, it was a bit of a let-down to see editorial transgressions such as the Thai currency "Baht" misspelted as "Bhat" (p. 3) and "Delhi" misspelted as "Dehli" (p. 271). But for such minor follies, the book is indeed well written and is a valuable resource for researchers interested in globalization.

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Macro-econometric Model of a Developing Economy: A Case Study of Bangladesh

By Muhammad Mahboob Ali

Friends Publishers, Bangladesh, Pages: 108, ISBN: 9848491090, Price: US$20

This book seeks to present a macro-econometric model of Bangladesh's developing economy across a 28-year period from 1975 to 2003. Two distinct periods are identified and examined: macroeconomic policy under administrative control (1975-1990); and macroeconomic policy under reform measures (1990-2003). The author argues that although the economic structural adjustment process was introduced in the 1980s, real financial liberalization did not occur until 1990.

The book is structured in six chapters. Each chapter addresses a separate issue and is logically presented. Chapter one provides an introduction to the economy of Bangladesh and the underlying study. A comprehensive and useful review of relevant literature has been compiled and presented in chapter one. The aim of this compilation is to identify possible determinants of the real, monetary and external economic sectors and any interrelatedness between these sectors. The outcome is an extensive and relevant coverage of the pertinent literature, which will undoubtedly prove useful to other researchers in this area.

The author has subdivided the macroeconomic sectors of Bangladesh's economy into three sectors: real, monetary, and external. These sectors are dealt with separately in Chapters two, three and four. In these three chapters, the econometric model is specified; the statistical approach is outlined and results are analyzed; and a concise discussion is presented. Chapter two reveals that the use of fiscal policy is insufficient to fully control and improve the economic condition of the country. Chapter three reveals that monetary policy, in isolation, is also insufficient to fully control or improve Bangladesh's economic condition. Chapter four provides a discussion of the impact of the external sector on Bangladesh's economic condition and recognizes the multi-flow effect of this sector on other sectors of the country's economy.

In Chapter five, the author examines the nexus between the three economic sectors and argues for vertical and horizontal coordination between the sectors to reduce or eradicate demand and supply side problems detected in the study. Chapter six seeks to draw conclusions from the analysis presented in the previous chapters. Policy recommendations drawn from the analysis of study data and the relevant literature are also provided in chapter six.

The findings presented in this book include that GDP is the main determining factor in the real economy of Bangladesh. The author concludes that neither the Keynesian nor the Monetarist view of the macroeconomic model is fully applicable to the case of Bangladesh. To attain sustainable development, a good coordination between fiscal and monetary policies is required so that reliance on the external sector is reduced, stability within the financial sector is enhanced and economic growth is accelerated.

This book is the culmination of an exhaustive study of the effect of financial sector reform measures in the economy of Bangladesh. The planning and conduct of the research is appropriate. The output shows evidence of good research methodologies and technical adroitness. The review of literature is comprehensive. The book makes a valuable contribution to existing paradigms and practices in the economics literature.

I recommend the book for economic policymakers as it provides a useful and current view of the outcomes of the structural reform process implemented in Bangladesh and suggests ways in which the economic model might be improved. The book is also of value to researchers as it provides empirical findings in a research context that is not yet significantly examined in the economics literature. It references and connects very well to the findings of other similar studies. While the reliability of the study data must be considered in light of the significant use made of secondary data sources, it nonetheless presents a rational, intellectually rigorous and thoughtful treatise on the impact of economic restructuring in a developing economy.

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