



The Journal of Institute of Public Enterprise

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Role of Safety Culture and Safety Management on Organizational Sustainability : Evidence from Bangladesh

Shahadat Hossain*

Occupational safety is an important issue for the organizations and their employees. Safety culture and safety management both are critical to ensuring occupational safety. Build upon the human performance theory to safety management and the organizational support theory to reciprocity, the present study aims to empirically investigate whether safety culture and safety management have any influence on the safety performance and sustainability of the organizations. To investigate the issue, this study uses a survey dataset of 174 respondents from the senior executives, operations managers, and safety managers of Bangladeshi manufacturing firms through using a structured questionnaire. This study then applied Structural Equation Modeling (SEM) to test the hypothesis. The results indicate that safety culture has a strong influence on safety management, and as a chain effect, safety management influence the organizational sustainability. By the same line, safety performance strongly influences organizational sustainability. Findings of this study have both theoretical and managerial implications. This papers concludes highlighting its limitations and giving ways for further research.

Keywords : Safety Culture, Safety Management, Safety Performance.

Introduction

On the eve of an increasing concern over the casualties in the workplace, occupational safety has been recognized as an important issue both for the employees and for the organizations. Safety culture and safety practice in an organization are related to human activity. However, human activity is subject to human errors (Lindop & Rotblat, 1971). Injuries in the workplace are more often the results of management

issues. Poor safety culture and poor safety management practices in an organization may increase the possibility of human errors that can lead to accidents in the workplace causing human costs like deaths and the loss of economic potentials in the form of project delays,

* *Shahadat Hossain, Associate Professor, Department of Finance, University of Chittagong, Chattagram-4331, Bangladesh.*

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productivity decrease, and damage to production equipment (Fernández-Muñiz, Montes-Peón, & Vázquez-Ordás, 2009). Hence, safety culture in the organization, and the management commitment and workers' engagement to safety are important issues to workplace safety. These issues could have an influence on the safety performance of the organization. As sustainability and growth are important issues of modern day's organizations, safety culture and safety management, in turn, could have an influence on growth and sustainability of the organization.

Research on safety to date focused on overall organizational safety climate (Lai, Liu, & Ling, 2011; Pidgeon, 1991), safety culture (Hajmohammad & Vachon, 2014), safety management (Fernández-Muñiz et al., 2009; Wachter & Yorio, 2014), and safety policy and behavioural issues (Langford, Rowlinson, & Sawacha, 2000). Although organizational culture and management practices to safety are important for the effectiveness of safety, a few studies covered the influence of these issues on firm performance and sustainability. Build upon human performance theory to safety management (Scott, 1981; Scott & Davis, 2015) and organizational support theory to reciprocity (Eisenberger, Cummings, Armeli & Lynch, 1997), the present study aims to empirically investigate whether safety culture and

safety management have any impact on the organizational growth and sustainability. As the safety issue of the Bangladeshi manufacturing firms gained increasing concern after a few recent casualties in the Bangladeshi garments and manufacturing industries, the present study takes into account the context of Bangladeshi manufacturing firms. The results of this study contribute to the literature on occupational safety in many ways. First, this study provides a theoretical foundation for linking both safety culture and safety management with the safety performance and firm sustainability. Second, this paper not only measures the financial performance as the outcome of safety culture and safety management but also considers firm sustainability and growth as the ultimate outcome of safety in the organizations. Third, this study considers safety performance as the interim outcome of organizational safety practices. Finally, this study considers Bangladeshi context, as a new aspect and a developing economy, which is largely unexplored.

The remaining sections of this paper are organized as follows. The next section outlines the research objective; then section three covers the theoretical background and the hypotheses; section four discusses the research methods; and section five outlines the results of the study with the discussion in section six. Finally, section seven concludes the study.

Research Objective

The main objective of this study is to investigate the influence of safety culture and safety management practice on the firm performance and sustainability. The specific research objectives are :

- To investigate the effect of safety culture on safety management of the organization.
- To identify whether safety management has any influence on safety performance and organizational sustainability.
- To evaluate whether safety culture and management both have an influence on safety performance; and, whether both of them, in turn, have any impact on the organizational sustainability.

Literature and Hypotheses

Conceptual Framework

According to the human performance theory to safety management (Scott, 1981), it is considered that organizations have some latent weaknesses in their policies and procedures that could give rise to human errors (Reason, 1990, 2016). It may result in accidents in the workplace. Strict defense against all errors is time-consuming, and sometimes, uneconomical (Wachter & Yorio, 2014). Hence, as a norm of reciprocity depicted by organizational support

theory (Eisenberger et al., 1997), it is believed that employees behave positively and contribute well to the organization when the organization values the employees and cares about their well-being. Management activities should aim to improve workplace safety by supporting employees through safety management and by ensuring safety culture in the workplace. This, in turn, may increase the attitude and willingness of the workers to contribute positively to the organization (Eisenberger et al., 1997). Such a reciprocity helps the organization to achieve its long-term objectives. Based on these, a conceptual model can be proposed. Figure-1 shows the relationship of safety culture, safety management, safety performance and organizational sustainability in the model.

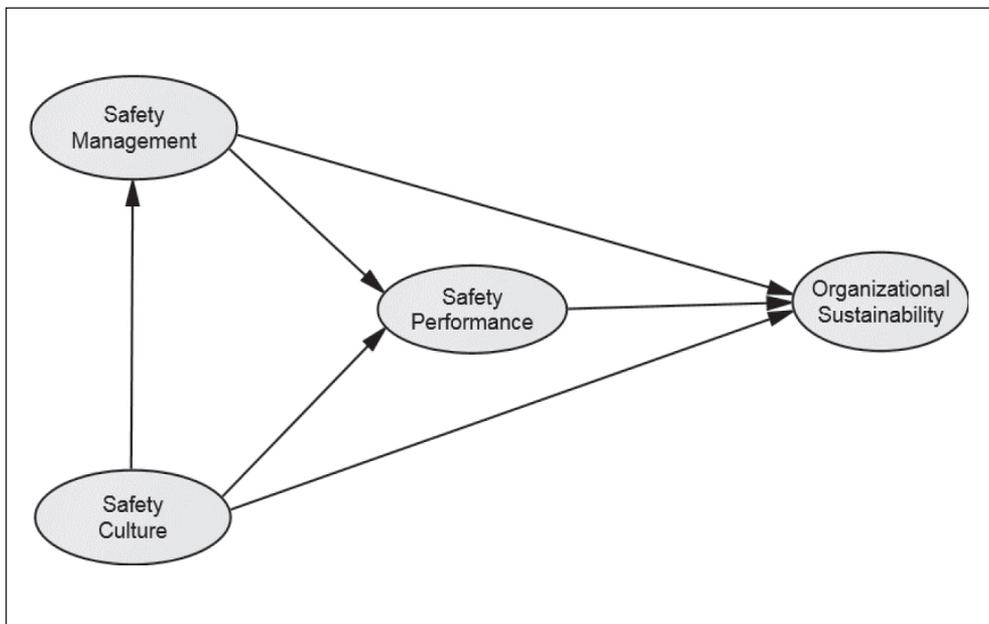
Safety Culture

Safety culture is a set of values, attitudes, perceptions, and behaviours with regard to occupational safety (Coyle, Sleeman, & Adams, 1995; Dýaz & Cabrera, 1997; Seo, 2005; Silva, Lima, & Baptista, 2004). Safety culture is shared and learned meanings, experiences, and interpretation of work and safety that guide organizational members' actions toward accident, risks and its prevention (Richter & Koch, 2004). It reflects the level of commitment and concern to prevent accidents in the workplace (Fernández-Muñiz, Montes-Peon, & Vazquez-Ordas, 2007). Safety culture

is used to delineate organizational culture in which safety is understood and an acceptable degree of effort is taken in the organization by which members of the organization direct their attention and actions to improve the safety of the workplace regularly (Choudhry, Fang, & Mohamed, 2007; Cooper, 2002). The main indicators of safety culture are management care about workers' safety, encouragement to the workers by listening and accepting workers' suggestions regarding safety, priority on safety of the organization before productivity, establishing and adhering safety rules and regulations, formal workplace protocols, and

employees' safety and psychological well-being (Hajmohammad & Vachon, 2014; Mearns, Whitaker, & Flin, 2003; Ostrom, Wilhelmsen, & Kaplan, 1993). Through safety culture, employees are aware of the workplace risks, and guard against, or try to avoid them (Ostrom et al., 1993). This, in turn, effectively helps in improving safety compliance and safety knowledge of the workers. When workers follow the safety compliance and when workers' knowledge about safety increase, the literature argues that developing and practicing safety culture in the organizations decreases accidents and injuries (Hofmann & Stetzer, 1996).

Figure-1 : Proposed Model of Safety Culture, Safety Management and Firm Sustainability



Safety Management

Firms often adopt safety management practices to manage safety system (Wachter & Yorio, 2014) to ensure the organizational sustainability. Safety management is important to control and prevent occupational accidents. Safety management practices are the integrated programs, policies, procedures, and activities designed and implemented in the organizations to control and prevent the risks of safety at the workplace (Kirwan, 1998; Wachter & Yorio, 2014). It is a part of management function of the organization that complies with the existing legislation. Safety management is a top-down approach to the control of organizational managers (Klein & Kozlowski, 2000). Safety management is also interconnected with human resource practices through collectively recruiting, selecting, developing, motivating and retaining workers while practicing safety management procedure. The literature (Fernández-Muñiz et al., 2007; Fernández-Muñiz et al., 2009; Hajmohammad & Vachon, 2014; McFadden, Henagan, & Gowen III, 2009; Wachter & Yorio, 2014) identified ten dimensions of safety management practices in the organizations such as, employee involvement, safety task reviews, safe work procedures, hiring for safety, cooperation facilitation, safety training, communication

and information sharing, accident investigation, detection and monitoring, and safe task assignment.

Safety Performance

Safety performance is an important criterion to ensure performance and sustainability of the firm. It represents the extent to which the organization is able to prevent accidents or any sort of adverse impact arises from the safety issue of the firm (de Koster, Stam, & Balk, 2011; Hajmohammad & Vachon, 2014). The literature (Fernández-Muñiz et al., 2009; Hajmohammad & Vachon, 2014) identified that personal injuries, material damage, employee motivation, and absenteeism or lost time due to accidents in the workplace are the important measures of the safety performance of the organizations. A few literature (Fernández-Muñiz et al., 2009; Hajmohammad & Vachon, 2014) posits that both safety culture and safety management have an influence on the safety performance of the organization.

Organizational Sustainability

Organizational sustainability is an important issue for every organization. As a part of organizational sustainability, firm performance is an important issue to ensure organizational sustainability and growth. Firm performance refers to some profit-oriented outcomes of

the firm that increase the profit of the firm and decrease its operating costs (Fernández-Muñiz et al., 2009; Hajmohammad & Vachon, 2014). However, a growth in profit or decreasing in cost is not an adequate idea to ensure firm sustainability. In addition to financial performance, an organization has to focus on future growth and sustainability through a competitive position in the market. Hence, the growth in market share through offering innovative products and services, developing the existing products and services to retain existing customers, ability to retain valuable and experienced employees, and the firm's competitive position in the industry are important issues the organization has to consider for its sustainability. Nevertheless, safety performance is supplementary to organizational sustainability.

Hypotheses

Safety Culture and Organizational Sustainability

Following the organizational support theory, it is assumed that when management gives priority on organizational safety and care about the safety and well-being of their employees, and develop an adequate safety environment, the employees, in return take a positive commitment to the organization (Rhoades, Eisenberger, & Armeli,

2001). They then show more willingness to pursue and enhance the organizational goal (Meyer, Allen, & Gellatly, 1990) through less absenteeism and employee turnover (Harrison, Newman, & Roth, 2006). It may increase their performance leading to productivity growth (Mathieu, Gilson, & Ruddy, 2006; Patterson, West, & Wall, 2004). Moreover, it leads to customer satisfaction to the firm (Rhoades & Eisenberger, 2002). Hence, it is can be stated that :

H1 : *The perceived level of safety culture is positively associated with organizational sustainability.*

Safety Culture and Safety Performance

According to human performance theory, an effective and positive safety culture can reduce the safety-related adverse outcome through reducing the possibility of accidents. When the safety compliance and the employees' knowledge about safety increase, it reduces the possibility of an unsafe behavior of the employees (Hofmann & Stetzer, 1996; Neal, Griffin, & Hart, 2000). This is because an effective safety culture constraints the employees' tendency to take shortcuts to achieve the immediate result through unsafe behavior. Literature suggests that an environment of emphasis on safety over productivity not only enhance personal safety but also provides a positive safety outcome in the

organization (de Koster et al., 2011; Hajmohammad & Vachon, 2014; McFadden et al., 2009; Zacharatos, Barling, & Iverson, 2005). Hence, it can be posited that :

H2 : The perceived level of safety culture is positively associated with the level of the safety performance of the organization.

Safety Culture and Safety Management

Organization's management practice is closely intertwined and coordinated with its main goal. Safety management is a part of management practice. Because management commitment to ensure safety is not enough, top management's commitment to safety must be supported by their actions through establishing and implementing safety management practices (Hajmohammad & Vachon, 2014). Employee engagement to safety, review of safety works, cooperation, information sharing and communication, and assigning the right person to the right tasks are a few issues of safety management practices in an organization (Fernández-Muñiz et al., 2007; Wachter & Yorio, 2014). A positive safety culture is believed to have a positive influence on the safety management practice. Hence, it is believed that :

H3 : The perceived level of safety culture is positively associated with the level of safety management of the firm.

Safety Management and Safety Performance

The literature suggests that safety management practice positively influences employees' perception of safety practices in their working conditions (Hajmohammad & Vachon, 2014). This, in turn, influences the employees to work in a safe manner (DeJoy, Schaffer, Wilson, Vandenberg, & Butts, 2004). Hoonakker et al. (2005) study posit that organization that has better safety management, are expected to achieve better safety outcomes. As these practices create mutuality among the employees and respond to their works (Hajmohammad & Vachon, 2014), it minimizes the workers and manager's tendency to apply unsafe procedures in their works that ultimately help in reducing accidents (Cox & Cheyne, 2000; Hajmohammad & Vachon, 2014; Rundmo, 2000). Hence, it can be hypothesized that :

H4 : Perceived level of safety management practices positively influence the sustainability of the organization.

Safety Management and Organizational Sustainability

Practicing safety management requires additional investments, which may increase costs to the firm. Moreover, maintaining safety compliance may reduce production outcomes. When an

accident causes deterioration in productivity it results in a loss in employee morale and financial performance (Brown, 1996; Rechenthin, 2004). Hence, safety management may have a negative impact on firm performance (Carrillo, 2005).

On the contrary, researchers (e.g., Hajmohammad & Vachon, 2014) suggest that firm performance and competitiveness outweigh the costs and investments related to safety management practice. Because deterioration of safety management practices in the organization can endanger the occurrence of accidents in the workplace that could have an adverse effect on productivity, product quality and through direct and indirect costs. Direct costs include material damage to the property of the firm, medical expenses, and rehabilitation and attorney fees for the injured or disabled workers from the accident. Indirect costs include disruption in operation, loss of customers and ready market, loss of experienced employees (Brown, Willis, & Prussia, 2000; Hajmohammad & Vachon, 2014; Manuele, 2011). All these not only influence firm financial performance but also its competitiveness and sustainability. Hence, it can be stated that :

H5 : Safety management practices positively influence organizational sustainability.

Safety Performance and Organizational Sustainability

Finally, the ultimate objective of safety performance is to improve firm performance and its competitiveness. Safety performance reduces the possibility of unsafe activities in the workplace that can automatically reduce the possibility of accidents. When such a possibility is reduced, it helps in direct and indirect costs savings, and this, in turn, increases the firm's positive financial return. Moreover, it helps to increase employee reputation and ability to attract high-quality employees (Howard-Grenville & Hoffman, 2003). It ultimately increases firm competitiveness (Ashford, 1998) and sustainability in the long run. Hence, it can be stated that :

H6 : Safety performance of an organization in turn, positively influences firm sustainability.

Research Methods

Sample and Data Collection

In order to test the above hypotheses, an empirical study was conducted on a group of Bangladeshi firms using a primary dataset collected through a structured questionnaire. To avoid the doubt about external validity (Silva et al., 2004), and to achieve an acceptable degree of generalization, the data were collected from the firms of a range of industries corresponding to garments

industry, metals and mining, energy, utilities, exploration, construction, production of materials excluding minerals and mining, and ancillary services to metal and mining. Moreover, the firms having both domestic and foreign operations are included in the sample. The respondents are the senior executives, the operations managers, and the safety managers of the firms. In the absence of safety manager, the person or the team assigned to safety management was selected as the respondents. The data collection period was from March to October 2015. Finally, the data consists of a total sample of 174 respondents.

Survey Instruments and Source of Scale Items

This study devised a questionnaire to compile information from the respondents. The first part of the questionnaire is for the senior executives and the second part of the questionnaire is for the safety executives. Though the questionnaire covered different issues, the information regarding the items of two constructs, “safety culture” and “safety management” were considered from safety managers, and the items of the endogenous constructs, “safety performance” and “firm performance” were considered from senior executives.

The survey instruments for the construct “safety culture” (SC) include nine items (Table-1 in the Appendix) adopted

from the literature (Hajmohammad & Vachon, 2014; McFadden et al., 2009; Sexton, Helmreich, Pronovost & Thomas, 2003). Similar to Hajmohammad and Vachon (2014) and McFadden et al. (2009), the measurement items of safety culture were developed on a seven-point scale ranging from the existence of “not at all” (1) to the existence “to a great extent” (7). Following the OHSAS 18001 guidelines (BSI, 2007), the nine item-scale captures the degree and level of safety culture implemented in the organization.

The original safety management practices include a composite of multiple questions adopted from Fernández-Muñiz et al. (2007), Fernández-Muñiz et al. (2009) and Wachter and Yorio (2014). A total of 45 items were included in the questionnaire with a five-point scale ranging from “strongly disagree” (1) to “strongly agree” (5). Another six items were also included in the questionnaire and three items of them were re-coded into the five-point scale with the same magnitude of percentage or importance. The items correspond to ten different sub-constructs are presented in Table-1 (in Appendix).

The endogenous construct, “safety performance” related items were developed based on Fernández-Muñiz et al. (2009). It involves asking the respondents about the level of satisfaction or dissatisfaction on the safety performance of the

organization on a five-point scale from “strongly dissatisfied” (1) to “strongly satisfied” (5). Details of the items are in Table-1. The final endogenous construct “organizational sustainability” (OS) includes the senior executives’ perception on the performance of the firm over the past three years to that of the other firms belonging to the same industry. In addition to the financial performance, this study considered firm growth, ability to retain essential employees, and the firm’s competitive position in the industry. Similar to safety performance scale, the item scale of organizational sustainability ranges from “much worse” (1) to “much better” (5).

In addition, this study included two control variables in the final model : senior executive’s long-term stay in the firm, and the age of the firm considering their possibility to influence safety performance and organizational sustainability.

Testing Hypotheses

To test the hypotheses, this study used the structural equation modelling technique (SEM), a frequently used technique in the literature (Brown et al., 2000; Fernández-Muñiz et al., 2009; Huang, Ho, Smith, & Chen, 2006; Silva et al., 2004; Siu, Phillips, & Leung, 2004). This technique helps to test complex models of relationships

among the variables considering all the model relationships simultaneously (Fernández-Muñiz et al., 2009). Before applying the SEM, Exploratory Factor Analysis (EFA) following Principal Component Analysis (PCA) was applied in line with Zheng, Kashi, Fan, Molineux, and Ee (2016), Anderson and Gerbing (1982) and Veloutsou (2007), to ensure validity, reliability, and uni-dimensionality of the scale items. At the second step, a measurement model was developed applying Confirmatory Factor Analysis (CFA) with PCA. Finally, using the constructs and their corresponding items from CFA, SEM was applied.

Addressing Common Method Bias

This study used the self-reported measures of the variables in only a single survey. Hence, the study has the possibility of common method bias (Ketokivi & Schroeder, 2004; Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). To minimize this problem, the information regarding the dependent variables and independent variables were collected from different sources (Podsakoff et al., 2003). Nevertheless, the un-rotated single factor test was run for all the items included in the study based on Harman’s single factor test. It generated more than one factor supporting that this study does not suffer from common method bias (Podsakoff et al., 2003).

Results

Exploratory Factor Analysis

The construct “safety management” includes 49 items corresponding to ten different sub-constructs. Following Anderson and Rubin (1956), this study produced another variable as Anderson-Rubin (A-R) latent factor scores for each of the sub-constructs. Compared to other methods, A-R score is more refined, maximize validity, and the scores are not only uncorrelated with the other factors but also uncorrelated with each other (Anderson & Rubin, 1956; DiStefano, Zhu, & Mindrila, 2009). However, before calculating A-R score, EFA was conducted for each of the sub-constructs with their corresponding items. The items, which do not follow uni-dimensionality, and have low factor communality (< 0.50), were dropped (Anderson & Gerbing, 1982). For example, one item (B13aSR) of SM_2, two items (B17aSW, B17bSW) of SM_3, two items (B22HS, B22aHS) of SM_4, one item (B38DM) of SM_9, and one item (B39TA) of SM_10 have low communality; hence, dropped from the analysis. Table-1A depicts the descriptive statistics and the status of the items of each sub-factor, and Table-2A presents the EFA results of the sub-factors with their reliability (Cronbach alpha).

At the second stage, EFA was conducted using PCA with the varimax rotation method on a full set of scale items

(Anderson & Gerbing, 1982; Veloutsou, 2007). Two sub-constructs of safety management (SM_6, SM_8), and two items of safety performance (SP3, SP4) have factor communalities less than 0.50; hence these items were discarded from further analysis. Moreover, the initial EFA reveals that one item of safety culture (A6) has the problem of cross loading. Hence, in line with (Roy & Rabbanee, 2015; Siu et al., 2004), this item was discarded from the analysis to ensure the discriminant validity of the scale items. Table-2 shows that items of the corresponding factors have high loading showing convergent validity of the constructs.

In the final EFA, the KMO measure of sampling adequacy is 0.854 and the Bartlett’s test of sphericity is significant at $p < 0.001$ ($\chi^2 = 3459.097$, $df = 276$, $N = 174$). Hence, it is evident that the items represent their corresponding constructs (Daunt & Harris, 2011), and each item is loaded highly on the respective construct. Moreover, it shows the face validity of the constructs supporting the theoretical development of the model. The sum of the squared loading of these four factors explains 71.68 per cent of the total variance, which is well above the minimum standard of 60 per cent. Finally, the Cronbach’s Alpha (Cronbach, 1951) for each of the four factors (Table-1) is well above the minimum threshold of 0.70 ensuring the reliability of the scale items. These measures indicate the appropriateness of the data to run a CFA.

**Table-1 : Descriptive Statistics and Factor Loading of
 the Scale Items included in the EFA**

Item Code	Scale Items	Mean	SD	Status	Factor Loading ^a
Safety Culture CB α = 0.918					
A1	Senior management listens to and cares about employees' safety concerns	6.08	1.072		.784
A2	The plant's management is driving the workforce to be a safety-centered organization	6.10	1.026		.851
A3	The plant's management acts upon the employees' suggestions regarding safety matters	6.06	.991		.811
A4	The plant's employees encourage each other to report any safety concerns they might have	6.08	1.169		.671
A5	Employees' safety is constantly reinforced as a priority	6.26	1.014		.780
A6	<i>The plant's management knowingly compromise safety concerns for productivity^b</i>			<i>Del</i>	
A7	The plant's employees adhere to the established safety rules and guidelines	5.95	1.064		.724
A8	The firm implements formal workplace protocols regarding employees' physical health	6.25	1.078		.868
A9	The firm implements formal workplace protocols regarding employees' psychological well-being	5.93	1.341		.787
Safety Management^c CB α = 0.916					
SM_1	Employee involvement/engagement	0	1		.723
SM_2	Safety task review	0	1		.801
SM_3	Safe work procedure	0	1		.872
SM_4	Hiring for Safety	0	1		.724
SM_5	Cooperation facilitation	0	1		.788
SM_6	<i>Safety training^c</i>	<i>0</i>	<i>1</i>	<i>Del</i>	
SM_7	Communication and information sharing	0	1		.839

(Contd...)

SM_8	Accident investigation ^c	0	1	Del	
SM_9	Detection and monitoring	0	1		.832
SM_10	Safe task assignment	0	1		.837
Safety Performance		CB α = 0.920			
SP1	Personal injuries	3.62	1.233		.873
SP2	Material damage	3.61	1.051		.875
SP3	Employees' motivation	Del			
SP4	Absenteeism/Lost time	Del			
Organizational Sustainability		CB α = 0.926			
FP1	Quality of products, service, or programs ^d	3.88	1.036	Del	.789
FP2	Development of new products, service, or programs	3.54	1.175		.817
FP3	Ability to retain essential employees	3.55	1.148		.751
FP4	Growth in sales	3.64	1.122		.900
FP5	Growth in profits ^d	3.50	1.094	Del	.884
FP6	Growth in market share	3.49	1.160		.901

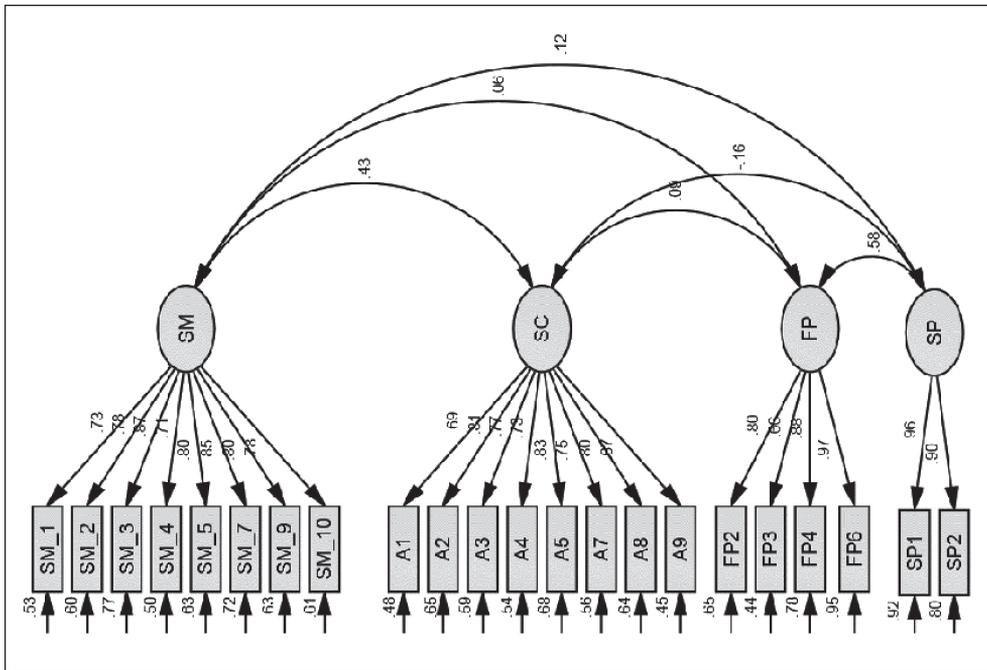
Note : ^a Extraction Method: Principal Component Analysis; Rotation Method : Varimax with Kaiser Normalization; ^b the item (A6) has the problem of cross loading; ^c Factor communalities less than 0.50; ^d Discarded in CFA as the standardized residuals covariance are higher than the absolute value of 2.0; ^e A-R factor score with mean 0 and standard deviation 1.

Measurement Model

Following the Gerbing and Anderson (1988) two-step method to SEM, a CFA was conducted on a full measurement model by using AMOS 22. All items in the CFA results reveal substantially high loadings (Hair et al., 2010; Raimondo et al., 2008) onto their corresponding latent factors (Figure-2) compared to the minimum threshold value of 0.50 (MacKenzie, Podsakoff, & Podsakoff, 2011) with the significant

level of $p < 0.001$. The model also reveals not any item suffers from cross loading. The Cronbach alpha of every construct is also above the threshold of 0.70 (Table-2), representing an adequate constructs reliability (Nunnally, 1978). In addition, the R^2 values of the items are substantially well above the minimum level (0.20) (Cui, Fan, Fu, & Zhu, 2013). Hence, the CFA results provide an initial support for convergent validity revealing an acceptable

Figure-2 : A Full CFA Measurement Model



$\chi^2 = 317.074$; $df = 183$; $\chi^2/df = 1.733$; $N = 174$; $GFI = 0.869$; $AGFI = 0.819$; $CFI = 0.955$; $TLI = 0.943$; $RMSEA = 0.065$.

level of model fit. However, two items of firm performance (FP1 and FP5) are discarded from the model as the standardized residuals covariance of these items is higher than the absolute value of 2.0 to ensure a good model fit. Furthermore, convergent validity of the constructs was assessed by an average variance extracted (AVE). The findings (Table-3) clearly demonstrate the evidence of the convergent validity of every construct as the AVE of every construct is greater than the minimum cut-off point of 0.50 (Fornell & Larcker, 1981; Hair, Black, Babin, Anderson, &

Tatham, 1998). Among the measures of composite reliability (CR), the lowest value of CR is 0.903 for firm performance, which is far higher than the lowest threshold of 0.70, indicating an ample evidence of internal consistency of the scale items.

Furthermore, based on Straub, Boudreau, and Gefen (2004), discriminant validity of the constructs is assessed by comparing the square root of the AVE values of each construct to its inter-correlation coefficient (R^2) with other constructs of the model. The square root of the AVE of every construct is above the

Table-2 : EFA Model Fit Statistics of the Construct “Safety Management”

Sub-Construct	Name of Sub-Construct	KMO	χ^2	TVE	CB α
SM_1	Employee involvement/engagement	0.873	313.327***	51.67	0.797
SM_2	Safety task review	0.869	573.788***	58.74	0.880
SM_3	Safe work procedure	0.745	217.799***	62.61	0.789
SM_4	Hiring for Safety	0.717	135.183***	54.45	0.710
SM_5	Cooperation facilitation	0.665	106.624***	64.38	0.720
SM_6	<i>Safety training</i>	<i>0.500</i>	<i>1.076</i>	<i>53.95</i>	<i>0.107</i>
SM_7	Communication and information sharing	0.846	491.284***	61.15	0.872
SM_8	<i>Accident investigation</i>	<i>0.746</i>	<i>0.750</i>	<i>53.304</i>	<i>0.124</i>
SM_9	Detection and monitoring	0.735	442.858***	70.30	0.865
SM_10	Safe task assignment	0.823	435.655***	76.96	0.899

Note : KMO = Kaiser-Meyer-Olkin measure of sampling adequacy; TVE = total variance explained by the factors in the model; CB α = Cronbach Alpha; *** < p.

Table-3 : Psychometric Properties and Correlation Matrix of the Constructs

	CR	AVE	MSV	MaxR(H)	FP	SM	SC	SP
FP	0.903	0.702	0.333	0.959	0.838			
SM	0.930	0.625	0.184	0.974	0.059	0.791		
SC	0.915	0.574	0.184	0.980	-0.089	0.429	0.758	
SP	0.927	0.864	0.333	0.985	0.577	-0.119	-0.156	0.930

Note : CR = composite (construct) reliability; AVE = Average variance extracted; MSV: maximum shared squared variance; MaxR(H): maximized reliability coefficient H. The diagonal elements in the correlation matrix (right-hand side) are the square roots of AVE, and the off-diagonal elements in the matrix are the standardized inter-construct correlations.

standardized inter-correlation coefficient (R^2) of other constructs (Table-2), supporting the existence of a satisfactory level of convergent and discriminant

validity (Bagozzi & Yi, 1988; Chin, 1998; Fornell & Larcker, 1981; Straub et al., 2004). Moreover, AVE of every construct is greater than their respective

value of maximum shared squared variance (MSV), indicating a further evidence of discriminant validity (MacKenzie et al., 2011) of the constructs.

In addition, the construct reliabilities (and convergent validity) is measured by the Hancock and Mueller's "maximized" reliability coefficient H [MaxR(H)] (Cui et al., 2013). The results of MaxR(H) are all well above 0.70, indicating outstanding construct reliability.

Finally, the model goodness-of-fit statistics for the CFA model in Figure-2 ($\chi^2 = 317.074$; $df = 183$; $\chi^2/df = 1.733$; GFI = 0.869; AGFI = 0.819; CFI = 0.955; TLI = 0.943; RMSEA = 0.06) demonstrate that the items representing with these four constructs are dissimilar from each other (Garson, 2011), and better fit for testing the hypotheses using SEM.

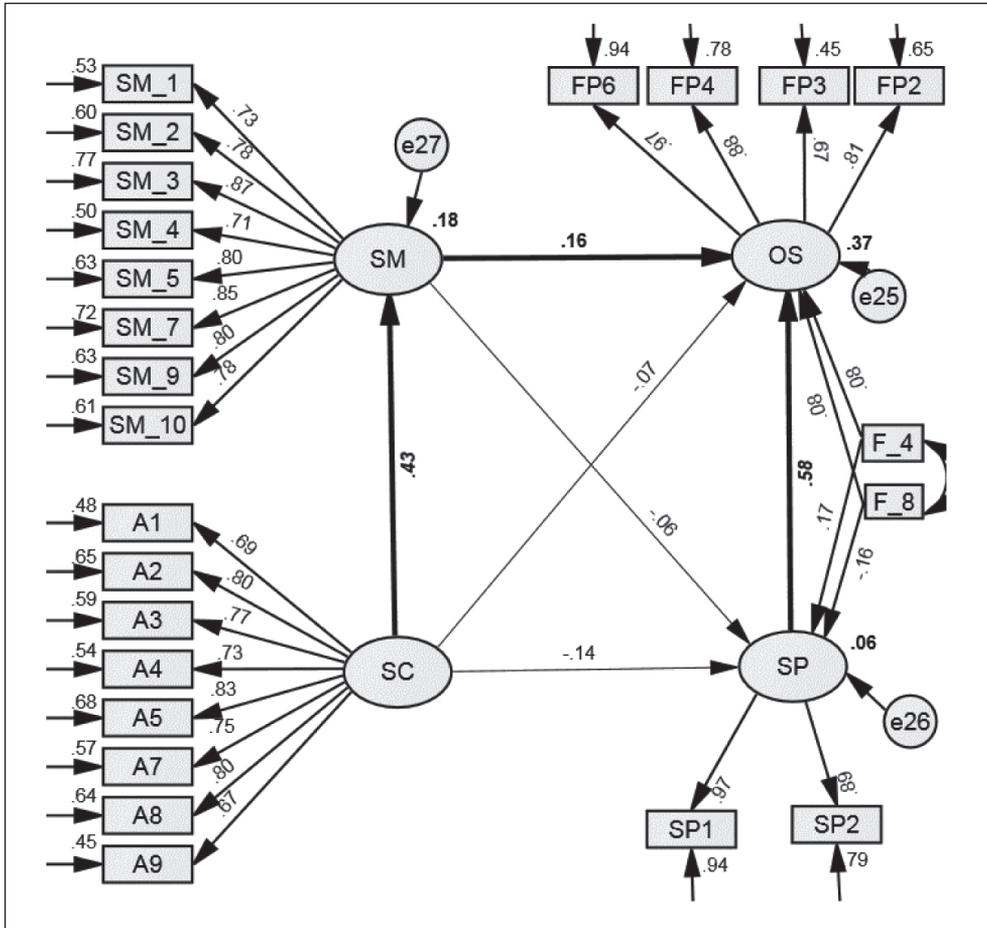
Estimation of Structural Model

Finally, the SEM was applied on the constructs and their corresponding items from the CFA measurement model. Including two control variables (F_4 and F_8), the results of the final SEM are presented in Figure-3. The goodness-of-fit statistics shows an acceptable fit of the data to the model. Though the χ^2 (388.446 with $df = 221$, $N = 174$, $p < 0.001$) statistics is significant,

the relative χ^2 (CMIN/DF₍₂₂₁₎ = 1.758) value is within the acceptable range of reasonably good model fit (Bagozzi & Yi, 1988). The fit statistics (CFI = 0.945; TLI = 0.931; RMSEA = 0.066) for this complex model with the small sample size are in the satisfactory level (CFI > 0.90; TLI > 0.90; RMSEA < 0.08) set by Byrne (2010) and Iacobucci (2010) for an acceptable SEM. Moreover, the lower bound (=0.055) and the upper bound (=0.077) of 90 per cent confidence intervals for the RMSEA are within the acceptable range. Furthermore, GFI (0.856) and AGFI (0.805) are also in the acceptable range (GFI > 0.8; AGFI = 0.8). Moreover, the hypothesized model accounts for 37 per cent of the variance ($R^2 = 0.37$) in the final endogenous variable (OS), indicating an acceptable explanatory power of the model (Kline, 2015). Table-4 depicts the structural paths for all the hypothesized relationships with their corresponding α coefficients, standard errors (S.E.) and the critical ratios (C.R.) for the model.

As presented in Figure-3 and Table-4, it is evident that the perceived level of safety culture has a significant positive influence on the level of safety management in the organization. As per the expected direction, its path coefficient ($\beta_{standardized} = 0.43$) is highly significant ($p < 0.001$), supporting the hypothesis (H3),

Figure-3 : Results of the Estimation of the SEM Including Control Variables



$\chi^2 = 388.446$; $df = 221$; $CMIN/DF = 1.758$; $N = 174$; $GFI = 0.856$; $AGFI = 0.805$; $CFI = 0.945$; $TLI = 0.931$; $RMSEA = 0.066$ ($LO90 = 0.055$; $HI90 = 0.077$); $PCLOSE = 0.009$

Note : Bold paths are significant ($p < 0.001$). SC : safety culture; SM : safety management; SP : safety performance; OS : Organizational sustainability.

and the literature (Hajmohammad & Vachon, 2014). Similarly, safety management has a significant ($p < 0.001$) positive ($\beta_{standardized} = 0.16$) influence on organizational sustainability (H5) supporting Fernández-Muñiz et al. (2009).

Hence, the path relationships of safety culture to safety management to organizational sustainability indicates that safety culture and safety management both are important for a better level of organizational sustainability.

Table-4 : Results of The Structural Paths

Structural Paths		Path coefficients (β)		S.E.	C.R.
		Standar- dized	Unstandar- dized		
Safety Culture	—> Safety Management	0.429***	0.420	0.088	4.790
Safety Culture	—> Safety Performance	-0.138	-0.222	0.144	-1.543
Safety Management	—> Safety Performance	-0.057	-0.094	0.146	-0.645
Safety Management	—> Organizational sustainability	0.160*	0.208	0.099	2.097
Safety Performance	—> Organizational sustainability	0.579***	0.459	0.064	7.162
Safety Culture	—> Organizational sustainability	-0.066	-0.084	0.097	-0.864
Controls					
SM Working Yrs.	—> Safety Performance	0.171*	0.020	0.010	2.106
Firm Operating Yrs.	—> Safety Performance	-0.161*	-0.005	0.002	-1.986
SM Working Yrs.	—> Organizational sustainability	0.082	0.008	0.007	1.178
Firm Operating Yrs.	—> Organizational sustainability	0.080	0.002	0.002	1.160
Variance explained in the endogenous variables : (squared multiple correlations of the endogenous variables)					
SM	R ²	=	0.184		
SP	R ²	=	0.063		
OS	R ²	=	0.367		

Note : *** p < 0.001; * p < 0.05

However, the path coefficient of safety culture and firm performance is not significant to support the hypothesis (H1) of the impact of safety culture on firm sustainability. Similarly, the relationship between safety culture and safety performance is not significant to support the hypothesis (H2). Likewise, another path relationship safety management

and safety performance are not significant (H4). Although the impact of safety culture and safety management are not significant, the results show that safety performance (H6) has a stronger (p < 0.001) and highly positive impact ($\beta_{standardized} = 0.58$) on firm sustainability, supporting Hajmohammad and Vachon (2014).

Among the control variables, the relationship between F_4 and SP is significant and positive ($\beta_{standardized} = 0.171$, $p < 0.05$), while the relationship between F_8 and SP is significant and negative ($\beta_{standardized} = -0.161$, $p < 0.05$). It indicates that as the senior managers employed in the firm for a longer time, their perceived level of safety performance improves, and as the firms become mature, and their level of safety performance becomes worse.

Test of Mediation

Though the model includes two endogenous mediating variables-safety management and safety performance, the relationships and the level of significance of the paths (SC – SM – SP – OS; SC – SP – OS) are not significant. Therefore, these path relationships do not fulfill the conditions of mediation. Hence, this study is not able to identify whether these two variables mediate the relationship between safety culture and firm performance.

Discussions

Though all hypotheses are not significant, the results of the influence of safety culture on safety management and the influence of safety management on different measures of firm performance lent the provision for the organizational support theory (Eisenberger et al., 1997). When safety culture of

the firm improves, it stimulates the management commitment and actions towards safety. The management practice to safety along with their routine task of managerial activities, in turn, improves firm performance and sustainability. The results of this study partly support the previous literature (Fernández-Muñiz et al., 2009; Hajmohammad & Vachon, 2014) that safety culture in the firm positively influence safety management, and safety management positively influences firm performance. It indicates that improved level of safety culture helps the management to develop and implement a more advanced and satisfactory level of safety management practices in the organization, and safety management practices, in turn, provide a better outcome to the firm.

Similar to Hajmohammad and Vachon (2014), this study finds strong evidence of the impact of safety performance on organizational sustainability. It supports the literature that safety performance reduces the costs related to occupational accidents (Cox & Cheyne, 2000) and increases employee loyalty (Meyer et al., 1990; Rhoades et al., 2001) and customer satisfaction (Rhoades & Eisenberger, 2002) that help the firm to ensure its competitive position in the industry. Moreover, this study reinforces the findings of Fernández-Muñiz et al. (2009) that safety management

practices positively influence firm performance. As stated earlier, the idea behind such impact may be the reciprocity in the firm. When management takes care of the employees regarding safety, the employees feel safe. This in return, provides a positive outcome to the firm. Moreover, it helps to reduce occupational accidents (Cox & Cheyne, 2000; Rundmo, 2000), thereby saving the direct and indirect costs related to the accidents (Brown et al., 2000; Manuele, 2011). Hence, this study also indirectly supports Wachter and Yorio (2014). Nevertheless, this result is also in line with the total quality management practices literature (Curkovic, Vickery, & Dröge, 2000; Nair, 2006) and human resource management literature (Subramony, 2009) as it elucidates the potential benefits of maintaining safety and quality of the working procedures and the management commitment and practice to empower employees.

In addition to the contribution to the literature on workplace safety and organizational sustainability, the results of this study have practical implication in developing the safety protocol in the workplace. Nevertheless, this study extended some additional dimensions of firm performance and sustainability in Fernández-Muñiz et al. (2009) and Hajmohammad and Vachon (2014) models.

Surprisingly, the path relationships of safety performance with safety culture and safety management are not significant although the relationship between safety performance and firm performance is positive and significant. This could be the possibility of some lagged relationships between these constructs (Hart & Ahuja, 1996), or due to the small sample size. The researchers should be careful before generalizing the findings from the Bangladeshi context.

Conclusion

Safety culture and safety management both are critical to ensuring occupational safety. Build upon human performance theory to safety management (Scott, 1981) and organizational support theory to reciprocity (Eisenberger et al., 1997), this study investigates whether safety culture and safety management have any influence on the safety performance and sustainability of the organizations. Adding additional dimensions to firm performance as the outcome of safety management and safety culture, this study suggests that safety management is important for the firm. Though the impact of safety culture on firm performance is not clear, it has a significant impact on safety management, that in turn influence firm performance. Hence, a positive safety culture is important for the firm. Moreover, though the influence of

safety management and safety culture on safety performance is not clear, this study finds a significant and positive impact the safety performance makes on firm performance and sustainability.

The results of this study provide an important insight into the practitioners and policy guidelines. On the eve of the increasing concern for workplace safety, this study provides an implication suggesting that safety management is important for firm performance and sustainability. This study put forward that management commitment to safety, ensuring safety management practices as part of their routine function, and engagement of the employees in the safety practice is critical for the firm growth and sustainability.

However, this study is not free from limitations. This study used only cross-sectional data. A multi-stage survey can make the study more meaningful through comparing the results of different stages. Moreover, the possibility of some lagged relationships between safety culture and safety performance, and between safety management and safety performance are not identified in this study. Furthermore, generalizing the findings from one country context is difficult.

Findings of this study suggest the possibility of future research. The proposed model can be extended by adding human

resource management and firm's foreign investment motive in the model. As the direct impact of safety culture on safety performance is not clear, it can be a new agenda for empirical exploration.

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Appendix

Table-1A : Descriptive Statistics of the Scale Items of Safety Management

Item Code	Description of the Items	Mean	Std. Dev
<i>Employee Involvement/Engagement</i>			
B1EI	Employees are involved in the process of creating safework instructions.	4.25	.714
B2EI	Employees can influence STOP work criteria.	4.32	.904
B3EI	Employees are involved in devising solutions to incidents that resulted from human error.	4.12	.793
B4EI	Employees are involved in performing safety observations of other employees.	4.52	.583
B5EI	Employees are involved in conducting incident investigations.	4.03	.829
B6EI	Employees are involved in the hiring for the safety of their peers.	3.56	1.009
<i>Safety Task Review</i>			
B7SR	When pre-task safety reviews are done, a review of critical steps is conducted.	4.41	.714
B8SR	When pre-task safety reviews are done, error likely steps/situations are addressed.	4.34	.739
B9SR	When pre-task safety reviews are done, the worst thing that could happen is discussed.	4.27	.764
B10SR	When pre-task safety reviews are done, special safe work procedures including personal protective equipment is discussed.	4.53	.602
B11SR	When pre-task safety reviews are done, energy sources requiring isolation are addressed.	4.36	.696
B12SR	When pre-task safety reviews are done, STOP work criteria are discussed.	4.37	.742
B13aSR	<i>How often are pre-task safety reviews done?*</i>		<i>Del</i>
B13SR	After finishing a task, employees participate in reviewing the safety aspects of their task.	4.32	.734

(Contd...)

<i>Safe Work Procedure</i>			
B14SW	Hazard analyses previously performed are thorough and robust.	4.24	.736
B15SW	Safe work procedures are reviewed and updated when necessary.	4.30	.806
B16SW	Safety “lessons learned” are considered when reviewing and updating safe work procedures.	4.47	.602
<i>B17aSW</i>	<i>What is the percent of routine tasks for which safe work procedures have been developed.*</i>		<i>Del</i>
<i>B17bSW</i>	<i>What is the percent of high-risk jobs that have completed hazard analyses?*</i>		<i>Del</i>
B17SW	Safe work procedures contain a warning about the potential consequences of deviation.	4.60	.511
<i>Hiring for Safety</i>			
B18HS	The safety values and beliefs of this organization are discussed in the interviews with potential employees.	4.08	.808
B19HS	Only the best people are hired to work in this Organization.	3.56	.986
B20HS	Job applicants go through background checks.	3.27	1.173
B21HS	Job applicants have to pass a physical test stating that they can physically do the job.	4.23	.916
<i>B22aHS</i>	<i>The number of interviews a job applicant goes through prior to job offer.*</i>		<i>Del</i>
<i>B22HS</i>	<i>Job applicants undergo a drug test prior to being hired.*</i>		<i>Del</i>
<i>Cooperation Facilitation</i>			
B23CF	Employees are encouraged to cooperate with each other on resolving safety issues.	4.42	.662
B24CF	Formal communication mechanisms among co-workers are robust enough to ensure that information being shared covers all necessary safety information.	4.33	.685
B25CF	Formal mechanisms are utilized to ensure that key safety information is communicated between off-going and on-coming shifts.	4.41	.617

(Contd...)

<i>Safety Training</i>			
B26aST	No. of hours of safety training per year offered to employees.	3.86	1.268
B26ST	Employees are formally trained on the safety aspects of their job.	4.60	.534
<i>Communication and Information Sharing</i>			
B27CI	Employees are informed of new or revised safety rules and safe work instructions	4.48	.603
B28CI	Employees are informed about potential hazards in the workplace or their tasks.	4.52	.640
B29CI	Information about the importance of working safely is communicated to employees (e.g., print media, posters, and payroll stuffers).	4.54	.630
B30CI	Employees are informed about safety incidents experienced by other similar organizations.	4.39	.717
B31CI	Employees are informed about safety incidents and/or near misses experienced by other employees.	4.35	.715
B32CI	When safety incidents do occur, the results of the investigation are shared among the workforce.	4.44	.723
<i>Accident Investigation</i>			
B33aAI	How soon are investigations initiated after their occurrences?	4.61	.826
B33AI	Incident investigations seek to uncover potential reasons why human error might have contributed to the incident	4.32	.781
<i>Detection and Monitoring</i>			
B34DM	Safety checklists have been developed corresponding to possible workplace hazardous conditions	4.55	.530
B35DM	Safety checklists have been developed which correspond to possible workplace at-risk behaviours	4.51	.574
B36DM	Safety observations target behaviours that deviate from safe work instructions	4.51	.641
B37DM	Safe work instruction deviations result in negative consequences for employees	4.45	.691
B38DM	<i>Deviations from safe work instructions are tracked and Monitored.*</i>		<i>Del</i>

(Contd...)

<i>Safe Task Assignment</i>		
<i>B39TA</i>	<i>Supervisors are provided with the flexibility to assign the right employee to the task.*</i>	<i>Del</i>
B40TA	When flexibility is allowed, past experience with the task is considered	4.37 .605
B41TA	When flexibility is allowed, the physical demands of the task are considered	4.39 .657
B42TA	When flexibility is allowed, the risk of fatigue or extended work hours is considered	4.38 .725
B43TA	When flexibility is allowed, the risk associated with stress or distraction is considered	4.21 .740
N = 174		

Note : * the items were deleted due to the low level of factor communalities (<0.50).

— X — X —

Measuring Basic Welfare Index for Indian States : An Empirical Analysis

Reena Kumari*

This paper is a comprehensive assessment of performance of different states of India in terms of basic welfare indicators. For making a welfare comparison among 20 Indian states in basic indicators, the study has constructed Basic Welfare Index (BWI) which includes four sectors : housing and sanitation, health, education, nutrition and other indices. The sub-indices related to these four indices provide information regarding people who have a poor standard of living as well as information on poverty intensity experienced by the people. The study has used the tool of disparity reduction rate, which measures the rate at which disparity between the actual value of an index and the ideal value of the index decreases per year. Results indicate that the scale of basic welfare across Indian states is diversified as Kerala, Himachal Pradesh and Tamil Nadu were the most affluent states, while Bihar, Jharkhand and Odisha were the most disadvantaged. Econometric analysis based on panel regression demonstrated that per capita net state domestic product and the role of public expenditure on health and education were the factors which determined the BWI. In addition to expenditure on health and education, the share of development expenditure to total expenditure along with per capita net state domestic product also has a significant effect on the BWI.

Keywords : Welfare Indicators, Public Expenditure, Public Spending, Housing and Sanitation, Health, Education, Nutrition, Disparity Reduction Rate, Poverty.

Introduction

The world has undergone rapid and tremendous change in the last couple of decades, much of it attributed to some facet of globalization. Such effect of globalization on India's economic performance during the 1990s and the first half of the new millennium has been described as that of an 'emerging economy' (Maitra & Ray 2013; Basu 2004), 'partially awakening giant' (Chaudhari & Ravallion 2007;

Bardhan 2010). The delineation of the country as a 'giant' of various description is based on only growth in macro-economic indicators, including gross domestic product (GDP), real per capita income, and escalation in foreign direct investment (FDI). However, the questions can be raised that do these macro level performances show the rate of change in basic social welfare indicators?

* Reena Kumari, Assistant Professor, CM College, LNM University, Darbhanga.

Are these indicators sufficient to explain the whole picture of normative or welfare economics, which is the prime agenda of Indian policy makers? Despite these achievements, the country has not been able to pull down inequality in basic social welfare indicators and provide a better standard level of living. The country is the most disadvantageous with respect to vital human well-being indicators such as health, education, and overall social development indicators. Sen admits that economic growth and expansion of goods and services are necessary for human development. However, he argues that wealth is not what we are pursuing, it is a means to achieve something else (Sen 1990: 44). It offers opportunities to live a good life, rather than to accumulate resources that matters most for well-being. The World Happiness Report also ranks countries on the basis of subjective wellbeing based on people's own feelings. Also, the Social Progress Index (SPI) is a measure of well-being developed by the celebrated economist Joseph Stiglitz 'Commission on Measurement of Economic Performance and Social Progress' and according to him, statistical indicators are important for designing and assessing policies aiming at advancing the progress of society, as well as for assessing and influencing the functioning of economic markets. A recent study by Planning Commission (2012)

analysed the performance of Indian States across three critical sectors-health, education and infrastructure and found out that Indian states are divergent in level of development in these three indicators and related sub-indicators.

There are huge debates among the scholars about measuring the quality of life and welfare of people. Which one is the best measure of welfare or well-being? Which measure covers all the important parameters of well-being? In literature, well-being of a population has often been measured in terms of income (Kolm 1969; Atkinson 1970; Kakwani 1980; Chakravarty 1990; Sen 1997). While many researchers have insisted on the inadequacy of income as the sole indicator of welfare and reported that the quality of life or welfare can be measured on the basis of a large number of attributes as it is relevant and feasible (Slottje & Raj 1997; Slottje 1991; Hirschberg *et al.* 1991; Sen 1985, 1987; Maasoumi and Nickelburg 1988; Atkinson and Bourguignon 1982; Mosler 1994; Tsui 1998; Bourguignon and Chakravarty 1999). Therefore, Majumdar *et al.* (1995) attempted to widen the scope of the physical quality of life measure by incorporating variables from various groups of socio-economic characteristics of people (urban population, life expectancy, infant survival rate, calorie supply per capita, adult literacy rate, energy

consumption per capita, etc.). The argument actually centered around the concept of welfare of the masses—whether welfare depends on per capita income measured in monetary terms (Richardson, 1998) or such other factors like improvement in health conditions (Sabhlok et.al. 2015), levels of literacy and education (Cassen 2002) or level of consumption (Radhakrishna 2015) or level of living (Mehrotra 2006). Dasgupta (1990) emphasized that measures of well-being can take one of two forms: they can reflect the constituents of well-being, or alternatively, they can be measured of the access that people have to the determinants of well-being. The theoretical issues raised by Sen (1983, 1985) showed that inequality is linked to many aspects of a person's life, including income, the availability of educational facilities, the provision of medical care, the quality of housing, safety, the quality of the natural environment, etc. came to be hotly debated in the post reform period (Cohen 2000; Majumdar 2007). While others argue that poverty reduction can be a better sign of improving well-being of people (Ravallion and Datt 2002) and economic growth has had a significant effect on social indicators (Jha 2013).

A numerous studies have identified human well-being concept that is linked to poverty and economic deprivation

that, in turn, relates to material aspects and standard of living. According to them human well-being should be treated as a multidimensional concept (Sen 1985, 1993; Stewart 1985; Doyal and Gough 1991; Ramsay 1992, Cummins 1996; Narayan *et al.* 2000; Nussbaum 2000). In this context, basic need approach to development was first discussed in 1970s and gained worldwide attention only in 1976 with the dissemination of an International Labour Office Report entitled *Employment Growth and Basic Needs: A One-world Problem* (ILO 1977). Unlike conventional growth-oriented models of development, the basic need approach attempts to alleviate the worst aspects of poverty by supplying a minimum standard of welfare to all persons and development progress is not conceptualised exclusively in terms of economic growth and per capita income. Basic needs essentially mean physical well-being and measure such as per capita income or its growth rate, is insensitive to distributional variations (Karkal & Rajan 1991). Similarly, it is argued that economic well-being, capability that stems from the economic well-being approach also highly connected to each other (Wagle 2008; Saunders 2005). Sen (1993) emphasized the capability approach by expanding the notion of poverty from welfare, consumption and income to broader

concepts such as freedom, well-being, and capabilities. According to Sen, poverty is understood as a state of capability of functioning deprivation that happens when people lack freedom and opportunities to acquire or expand their abilities. The Millennium Development Goals (MDGs) have also helped in bringing out a much needed focus and pressure on basic development issues, which in turn led the governments at national and sub national levels to do better planning and implement more intensive policies and programmes.

In India, experiences show that the nation has not been able to meet the basic needs of the poor and the deprived sections of the society. The incidence of rural poverty has reduced considerably from 41.8 per cent during 2004-05 to 25.7 per cent in 2011-12 due to growth in the farm sector (Ahluwalia 1978; Narayanmoorthy 2001; 2013; Saleth et al 2003; Hussain & Hanjra 2003; 2004). However, it is still 25.7 per cent as of National Sample Survey (NSS) estimate for the year 2011. When we look at the basic indicators of social development, we find that as many as 68.8 per cent of the Indian population lives in rural areas (the projected rural population 2016 is based on the Census data 2011). World Bank data for 2015 shows that the Infant Mortality Rate (IMR) per thousand of live birth in India is 38, much higher

than that of China (9), Indonesia (23) and Brazil (15), Sri Lanka (8) and other developing countries. As of census 2011, in India, 55 per cent of households have no access to latrine facilities within premises, 34 per cent households have no electricity connection, 35 per cent females are illiterate, and thus, these available data give enough reason to believe that gains in development have not been distributed equally across the states. It, therefore, becomes necessary that the Indian data be analyzed using a development indicator that is a basic need-oriented for understanding the changes in development population. It is hoped that such an analysis will be of help in identifying areas where share in the development is unequal and thus it will be of use in future planning. The aim of the paper is to identify the disparity in basic welfare attainment of the 20 states of India, which cover around 97 per cent of the country's population and are most disadvantageous with respect to poverty in general and in each of the investigated dimensions, i.e., living standards, health, and education in two benchmark years 2001 and 2011. The study has two objectives; first, to construct the BWI by using numerous social and well-being indicators. Second, to estimate the factors which determine the basic welfare of the 20 Indian states. Thus, the paper is divided into four sections. Section second deals with

methodology for constructing BWI and details about the indicators and related sub-indicators. Section third estimates the factors which affect BWI, for which panel regression has been used. The last section concludes and provides policy implications.

Methodology for Constructing Basic Welfare Index

One of the central points of contention in the literature is how to measure welfare or well-being. Critics argue that national income or Net National Product (NNP) of a country is calculated by adding the nation's consumption to its net investment have no significance for welfare and it does not represent the maximum attainable level of consumption or well-being (Murty 2014). Several measures have been developed in the literature to measure the welfare of people, like poverty rates, Physical Quality of Life Index (PQLI), Level of Living Index (LLI) and Human Development Index (HDI). Another approach related to the physical quality of life and betterment of human being and used different indicators which signify a better human health, education rather than income. The most frequently used composite index of development in 1979 was the PQLI with three variables: infant survival rate, adult literacy rate and life expectancy (McGillivray 2007; Stanton 2007; Sumner 2006). Another example is the

well-known and debated HDI created in 1990, combining income per capita (in PPP terms), life expectancy at birth, adult literacy and education enrollment ratios. Although far from a perfect measure of welfare, some of the HDI's strengths lie on its simplicity and transparency (UNDP 2010). While a growing literature on multidimensional poverty and multidimensional well-being, they used composite indices invariably and a different set of data and weighting structure (Jayaraj & Subramanian 2010; Mishra and Shukla 2015; Dehury and Mohanty 2015). The PQLI approach is relatively better and appealing as it attempts to measure welfare through indicators that are objective, reflect results or 'output' rather than inputs, simple to construct and also easy to comprehend (Morris 1979).

However, PQLI method also has certain limitations. In the first place, its indicators are too few in number to give a comprehensive idea even about the minimum desirable welfare (Dholakia & Dholakia 2004). Moreover, out of the three indicators, viz. IMR, life expectancy at the age of one year and adult literacy rate, two indicators relate only to health. More importantly, these two variables are usually ill-measured in the LDCs (Dholakia 1990). Secondly, the most important component of food and nutrition is conspicuously absent. Thirdly, it does not consider sanitation

and household amenities indicators in constructing the index. These limitations make the PQLI more unstable, unreliable and less comprehensive. Lastly, the indicators chosen for PQLI are not selected on the basis of any systematic theoretical framework. On the other hand, the Basic Welfare Index (BWI) proposed in this study is constructed out of those indicators using the method by Dholakia (1990). Thus, for measuring BWI, a select number of indicators related to housing and amenities; education, health; nutrition and others across the states have been presented in Table-1. The study has taken four broader sectors which measure and fulfill the basic need of people and directly related to better well-being of people across the states.

In all the thirteen well-being indicators identified which explain the basic welfare of any nation. The average outcome of all essential inputs for housing and sanitation is measured by (i) access to drinking water within the premises (DW), defined on the basis of the distance travelled to collect water (ii) toilet facility within the premises (AL) which is defined as households having toilet either for exclusive use, or share the same toilet with one or more households have been counted as privileged as regard access to toilet facilities, and access to electricity defined on the basis of its use as a primary source of energy for lighting by the

households (HE). Basic health input is measured by (i) infant mortality rate (IMR), measured per thousand live birth (ii) birth rate (BR), and death rate (DR). Education index includes (i) male literacy rate (ML), female literacy rate (FL), gross enrolment rate (GER) (IX-X), and gross enrolment rate (GER) (XI-XII). To capture the nutritional and other aspects like (i) female work participation rate (FWPR), (ii) proportion of below poverty line, and (ii), female mean age at marriage have been taken. All the selected indicators are measured in different units they have to be converted into a unidirectional form for measuring in index form. Thus, the methodology adopted for constructing such indices is the same as followed for PQLI (Morris 1979; Dholakia and Dholakia 2004). For each indicator, the performance of an individual state is put on a 0 to 100 scale, where 0 corresponds to an absolutely defined worst performance and 100 represents an absolutely defined best performance (Table-1). Because the selected indicators are measured in different units they have to be first converted into indices. Moreover, they have to be made unidirectional in order to meaningfully add them. The methodology adopted by us for constructing such indices is the same as followed for PQLI (Morris 1979). These indicator indices are then combined to construct component indexes.

Table-1 : Critical Values and Formulae for Indices

Dimensions	Abbreviation	Variables	Best Value	Worst Value	Formula
Housing and Sanitation	DW	Access to drinking water within premises	100	23	$\frac{V - 23}{100 - 23} \times 100$
	AL	Toilet facilities within premises	100	15	$\frac{V - 15}{100 - 15} \times 100$
	HE	Electricity as source of lighting	100	10	$\frac{V - 10}{100 - 10} \times 100$
Access to Health Facilities	IMR	Infant mortality rate (Per 1,000 population)	12	87	$\frac{87 - V}{87 - 12} \times 100$
	BR	Birth rate (Per 1,000 population)	33	16	$\frac{V - 0}{100} \times 100$
	DR	Death rate (Per 1,000 population)	5	11	$\frac{11 - V}{11 - 5} \times 100$
Education	ML	Male literacy rate (per cent) (Above age five)	100	60	$\frac{V - 60}{100 - 60} \times 100$
	FL	Female literacy rate (per cent) (Above age five)	100	33	$\frac{V - 33}{100 - 33} \times 100$
	GER_IX_X	Gross enrolment rate (GER) (IX-X)	100	22	$\frac{V - 22}{100 - 22} \times 100$
	GER_XI_XII	Gross enrolment rate (GER) (XI-XI)	100	3	$\frac{V - 3}{100 - 3} \times 100$
Nutrition and others	FWPR	Female work participation rate (Per cent)	100	15	$\frac{V - 15}{100 - 15} \times 100$
	BPL	Percentage of people below poverty line (Per cent)	0	61	$\frac{61 - V}{61} \times 100$
	FMM	Female mean age at marriage (years)	24	18	$\frac{V - 18}{24 - 18} \times 100$

Source : DW, AL, HE, ML, FL, FWPR, FMM from Census of India, Ministry of Home Affairs, Government of India.

IMR, BR, DR from Annual Health Bulletin, Government of India.

GER_IX_X and GER_XI_XII Ministry of Human Resource Development, GoI.

BPL from National Sample Survey 61st and 68th Round

Note : V= Actual value of the indicator.

Within each component index, the explicit weight attached to a different indicator index is equal, and similarly, for construction of the BWI each of the four components is given equal weightage.

To see the improvement of states in BWI, the study has calculated Disparity Reduction Rate (DRR) which shows the rate of reduction of disparity over time (Morris 1979; Dholakia & Dholakia 2004; Karkal & Rajan 1991). Formula for DRR is :

$$DRR_{t,t+n} = \frac{-\left[\{X_{t+n}^*\}^{\frac{1}{n}} - 1\right]}{X_t^*} \times 100$$

Where $DRR_{t,t+n}$ = Disparity Reduction Rate during the period n.

$X_{t+n}^* = X_{t+n} - 100$ = Disparity between actual welfare and ideal welfare at end of period.

$X_t^* = X_t - 100$ = Disparity between actual welfare and ideal welfare at start of period.

X_{t+n} and X_t are the levels of indexes X at time t+n and t.

Basic Welfare Index of Indian States

For each of the 20 states, we construct BWI using all the variables mentioned in Table-1. Inter-state estimates of the

four major components of basic welfare for the two benchmark years 2000-01 and 2011-12 has been given in Table-2. The distance of each state, and the country as a whole, from the ideal value of indexes (=100) shows the shortfall in the basic welfare level in a state, as compared to the ideal conditions already achieved elsewhere. Therefore, it shows the task lying ahead in different directions. There is a lot of variation in the values of the indices across the states. In housing and amenities index, Punjab stood with the highest index while Jharkhand the lowest¹. In education sector, Kerala has been the first during both years while, Bihar the least in 2000-01 and Assam, in 2011-12. Bihar and Assam are not only poor performers in education, they are also poor in many economic indicators, i.e., a very high level of poverty (33.7% and 32% respectively) and high unemployment rate (8.3% and 6.3% respectively)². Despite being the highest performer in social indicators, unemployment rate is the highest among 20 states (according to National Sample Survey report 2011-12). The state of Kerala stood with the highest rank in the health sector, while Odisha has been the lowest in both years. The situation of Himachal Pradesh in nutrition and other sector has been the best while Bihar the worst in this sector during both periods.

Table-2 : Component Indices of Basic Welfare Index

States	Housing and Amenities		Education		Heath		Nutrition and Others	
	2001	2011	2001	2011	2001	2011	2001	2011
Andhra Pradesh	56.89	73.64	50.42	60.39	35.37	42.50	53.10	60.60
Assam	45.75	47.00	19.85	38.25	36.93	44.19	48.84	56.32
Bihar	30.78	31.96	24.45	28.07	49.47	55.63	16.13	28.24
Chhattisgarh	38.05	53.06	45.82	31.62	39.81	51.22	50.74	61.28
Gujarat	69.44	76.29	49.03	50.23	48.33	54.89	48.18	62.15
Haryana	71.27	83.30	53.87	50.92	54.24	65.23	61.69	72.15
Himachal Pradesh	71.79	86.09	53.92	67.17	47.10	56.32	89.96	90.52
Jammu & Kashmir	64.85	68.30	32.04	35.64	47.29	54.69	76.29	88.62
Jharkhand	16.79	26.02	29.63	35.26	59.34	65.32	30.56	42.35
Karnataka	65.54	72.14	54.63	65.23	45.32	59.63	51.85	68.25
Kerala	56.98	65.67	90.33	98.65	60.70	75.23	60.49	75.24
Madhya Pradesh	48.44	50.34	41.72	57.63	34.48	49.34	46.23	54.21
Maharashtra	61.82	68.10	75.03	82.00	48.49	54.84	44.62	62.14
Odisha	25.23	32.77	48.74	58.63	21.72	34.87	29.57	42.51
Punjab	85.87	92.68	50.69	58.63	44.27	58.25	55.67	68.24
Rajasthan	44.71	50.09	35.63	43.21	47.02	59.41	55.70	65.82
Tamil Nadu	64.75	74.58	76.36	81.52	40.94	48.89	63.30	79.24
Uttarakhand	56.39	65.99	50.92	55.63	57.90	65.24	49.01	74.41
Uttar Pradesh	52.27	60.44	51.88	55.23	36.96	54.02	27.14	45.28
West Bengal	54.06	63.08	42.62	56.23	48.46	50.75	20.06	35.24
India	53.06	59.44	46.31	56.36	41.73	52.31	42.58	58.24

Note : Calculated by using formulae and indicators given in Table-1.

The study emphasizes the change in basic welfare rather along with the level of basic welfare across the 20 states of India from 2001 to 2011. It is a useful exercise first of all to look at the best and worst-off

sets of these selected states (Table-3). Our results indicate that the scale of basic welfare across the Indian states is diversified, with Kerala, Himachal Pradesh and Tamil Nadu are the most

affluent states, and Bihar, Jharkhand, and Odisha are the most poor. Among the three bottom ranked in 2001, Bihar is the least developed due to poor performance in education and nutritional indicators. It is demonstrated that

there are states with declining rank in the levels of BWI, such as Chhattisgarh and Jammu & Kashmir, while Uttarakhand and Uttar Pradesh are two states which record an increase between 2001 and 2011.

Table-3 : Basic Welfare Index and its Disparity Reduction Rate

State	BWI		Reduction in BWI from 2001 to 2011	Rank	Disparity Reduction Rate (DRR)	Rank in DRR
	2001	2011				
Andhra Pradesh	48.94	59.28	2.24	11	2.24	8
Assam	37.84	46.44	1.48	16	1.48	17
Bihar	30.21	35.98	0.86	19	0.86	20
Chhattisgarh	43.60	49.29	1.06	17	1.06	19
Gujarat	53.74	60.89	1.66	10	1.66	15
Haryana	60.27	67.90	2.11	5	2.11	10
Himachal Pradesh	65.69	75.02	3.12	2	3.12	2
Jammu and Kashmir	55.12	61.81	1.60	9	1.60	16
Jharkhand	34.08	42.24	1.31	19	1.31	18
Karnataka	54.34	66.31	2.99	7	2.99	3
Kerala	67.13	78.70	4.25	1	4.25	1
Madhya Pradesh	42.72	52.88	1.93	14	1.93	11
Maharashtra	57.49	66.77	2.43	6	2.43	7
Odisha	31.32	42.19	1.71	18	1.71	14
Punjab	59.12	69.45	2.87	4	2.87	5
Rajasthan	45.77	54.63	1.77	12	1.77	13
Tamil Nadu	61.33	71.06	2.86	3	2.86	6
Uttarakhand	53.56	65.32	2.88	8	2.88	4
Uttar Pradesh	42.06	53.74	2.23	13	2.23	9
West Bengal	41.30	51.33	1.86	15	1.86	12
India	45.92	56.59	2.17		2.17	

Note : BWI is calculated by using the formulae given in Table-1.

In order to measure the change in BWI, the study has used the tool of DRR (Morris 1979; Dholakia 1990; Dholakia & Dholakia 2004) which measures the rate at which the disparity between the actual value of an index and the ideal value of the index decreases per year. In other words, it indicates the rate of improvement or movement towards the ideal or targeted value. The last second columns of Table-3 give the DRR of BWI during 2000-01 and 2011-12. It is argued that the high economic growth leads to higher reduction in *disparity*; however, there are some outliers.

Gujarat is a highly developed state of India still ranked 15th position in DRR. It gives a hint to examine the absolute value of selected indicators in terms of mean, standard deviation and their difference over time, so that actual progress can be observed (Table-4). Also the independent assessment of all these indicators is meant for social observer and policy makers to infer well-being of each attribute (Mishra & Shukla 2015). It was found that disparity reduction was higher in Kerala followed by Himachal Pradesh while it was lower in Bihar followed by

Table-4 : Improvement in Basic Welfare Index Indicators

Variable	Mean		SD		Difference in Mean	Difference in SD
	2001	2011	2001	2011		
DW	75.01	83.16	17.43	14.85	8.1	2.6
AL	38.07	50.02	16.95	20.07	11.9	-3.1
HE	59.60	71.95	24.76	24.11	12.4	0.7
ML	76.27	81.82	7.66	5.71	5.6	1.9
FL	54.86	65.63	11.89	9.55	10.8	2.3
GER_IX_X	57.03	69.23	24.24	15.22	12.2	9.0
GER_XI_XII	32.21	47.16	24.26	17.06	15.0	7.2
IMR	60.30	40.67	4.68	12.18	-19.6	-7.5
BR	24.49	20.52	1.30	4.25	-4.0	-2.9
DR	8.02	6.98	18.37	0.75	-1.0	17.6
FWPR	27s.15	26.69	7.65	8.38	-0.5	-0.7
BPL	38.44	20.22	12.69	10.80	-18.2	1.9
FMM	20.47	21.35	1.36	1.03	0.9	0.3

Source : Author's estimates.

Note : SD= Standard Deviation.

Gujarat. While there was progress in all the variables during 2001 to 2011, yet standard deviation showed that the disparity between the states has increased in certain indicators like toilet facility, IMR, birth rate and female work participation rate. Standard Deviation (SD) represents a sign of disparity in both time periods confirms that disparity has declined from 2001 to 2011 in DW, HE, ML, FL, DR, BPL and FMM indicators. On the other hand, the disparity has increased in the indicators, such as, AL, IMR, BR and FWPR in the same period. It forced us to examine the performance and accountability of social sector schemes and implementation of family planning and respective policies in the different states of India.

The correlations between all the variables that have been used in constructing BWI are reported in Table-5. It is observed from the Table that a positive and significant correlation exists among the toilet facility within premises in relative to female literacy, GER and people live below the poverty line, electricity as a source of lighting is negative and significantly correlated with the relative people live below the poverty line, and birth rate related to population below the poverty line; and, IMR in relation to the birth rate. All the educational indicators such as male literacy, female literacy, GER (IX-X) and GER (XI-XII) show high and significant positive

correlations with access to toilet facilities within the premises. Other variables that have negatively and a strong influence on access to toilet facilities within premises include birth rate and poverty ratio. Unexpectedly, the indicator of access to an improved source of drinking water has a low and insignificant correlation with all the indicators.

The public expenditure in the social sector determines the level of living and poverty reduction in any nation. Supporting this fact, numerous studies emphasized the role of resource allocation or impact of public expenditure on health, education and other social sector indicators (Mahal & Rajaraman 2010; Chakraborty 2009; Chakrabarti & Joglekar 2006; Dholakia & Dholakia 2004; Fan et al 2000). While many have attempted to answer the practical question about how much a government should allocate to different sectors (Rath 2013; Mishra 1982; Dholakia 1993). To investigate the inequality in the allocation of resources among the state by public agency Figure-1 provides substantial interstate variations in public spending in social sector as a percentage of GSDP at real prices (2004-05). It has been seen that disparity in social sector expenditure was the highest in the last year of 1990s and further declined and remained stagnant in the mid 2000s. It has again increased rapidly from 2004-05 to

Table-5 : Correlation Matrix of Variables used for Basic Welfare Index

	DW	AL	HE	ML	FL	GER_IX_X	GER_XI_XII	IMR	BR	DR	FWPR	BPL	FMM
DW	1												
AL	-0.13	1											
HE	0.07	0.46**	1										
ML	-0.29	0.52*	0.63*	1									
FL	-0.30	0.69*	0.56*	0.91*	1								
GER_IX_X	-0.05	0.66*	0.56*	0.69*	0.67*	1							
GER_XI_XII	0.06	0.59*	0.57*	0.56*	0.49**	0.87*	1						
IMR	0.22	-0.49**	-0.56*	-0.66*	-0.75*	-0.41***	-0.38	1					
BR	0.05	-0.55*	-0.69*	-0.63*	-0.76*	-0.48**	-0.36	0.76*	1				
DR	-0.11	-0.23	-0.33	-0.17	-0.10	-0.01	-0.21	0.48**	0.33	1			
FWPR	0.07	-0.40***	0.26	0.11	-0.07	0.23	0.09	0.12	0.01	0.27	1		
BPL	-0.09	-0.64*	-0.78*	-0.53*	-0.52*	-0.55*	-0.64*	0.59*	0.73*	0.56*	0.07	1	
FMM	-0.10	0.31	0.44**	0.39	0.40***	0.35	0.21	-0.36	-0.50*	-0.29	-0.12	-0.45**	1

Source : Author's estimates.

Note : *p<.01, **p<.05, ***p<.10. All the variables have been defined in Table-1.

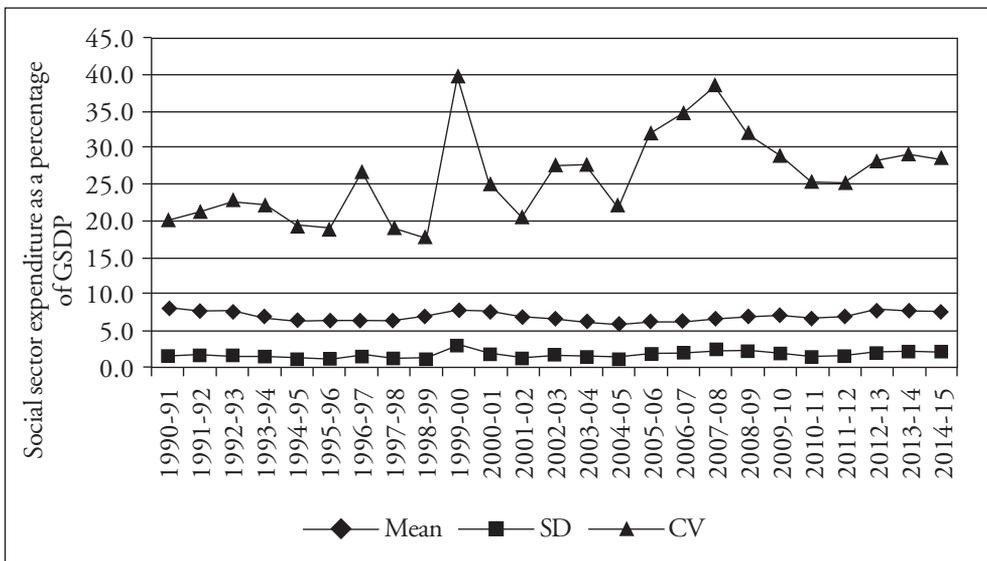
2007-08 and then declined after that. It gives a hint to examine interstate variations in basic welfare indicators, for example, housing, education, health and nutrition.

Estimation of the Econometric Model

To examine the relationship between public expenditure on social sector and basic welfare, we estimate the panel regression model. To test our model empirically, data for 20 states of India has been considered. We present results on the correlates of basic welfare index in public spending on social sector in two different specifications. First, BWI is dependent variable, while independent

variables are percentage of developmental expenditure to total expenditure, per capita real net state domestic product (NSDP), and second, with expenditure on health and education to total development expenditure. Hence, as per our model, we have to consider the level of NSDP rather than the growth in the economy. In order to examine the structural shift in the slope parameters between the two sub-periods, for example, 2000-01 and 2011-12, the technique of regression is used. We have tested the hypotheses with respect to aggregate developmental expenditure, and its social and economic components, to find out whether the developmental effort *per se* is important, or whether

Figure-1 : Interstate Disparity in Expenditure of Social Sector as Percentage of GSDP (at 2004-05 Prices)



Source : Computed by author using data from the Reserve Bank of India.

its composition and components are relevant to improve BWI. Interestingly, it emerges from the results that it is not the combined developmental expenditure, but its allocation to social sectors that is relevant for the rate of improvement in basic welfare.

Two models have been chosen based on the overall significance of the regression model (Adjust-Rsquared) and the stability and significance of the coefficients of the explanatory variables (Table-6). As hypothesized, public expenditure in terms of development expenditure and social sector expenditure (i.e., health and education) out to be strong factors influencing BWI in both of the chosen model. Another variable that shows a strong relationship with BWI is per capita income in terms of the per capita

NSDP. Thus, the regression fit of a model with aggregate developmental expenditure (dev_exp) with NSDP turns out to be good and statistically significant (Model-1). On the other hand, when we consider the model with separate components of expenditure on health and education (heal_edu_exp), with per capita income (PCI), the fit of the model significantly improves, and becomes statistically significant (Model-2).

The results of the above model suggest that per capita income and development expenditure as percentage of total expenditure are the important factors determine the attainment of basic welfare across the state with 65 per cent adjusted R-square (Model-1). In other words, both variables are statistically significant

Table-6 : Regression Results of the Model

Dependent Variable for all Regressions is Basic Welfare Index (BWI)		
Independent Variables	Model-1	Model-2
Constant	-1.072	-0.291
PCI	1.587 (10.02)*	1.473 (9.813)*
dev_exp	.290 (2.958)*	
heal_edu_exp		0.361 (3.948)*
Adjusted R_squared	.65	0.76
No. of observation	40	40

Source : Reserve Bank of India and Central Statistical Office, Government of India.

Note : * presents one per cent level of significance. Figures in parenthesis are t value.

Per capita income is based on 2004-05 series.

at the 1 per cent level. As per these estimates, if the government's development expenditure to total expenditure (*dev_exp*) increases, the BWI would increase significantly. In Model-2, we have taken the share of expenditure on health and education along with per capita income and, thus, again the adjusted R-square comes with a very high percentage level as 76 per cent. In the second model, both variables are also significant at the 1 per cent level, which shows that government expenditure on social sector are responsible for better attainment in BWI of the states. As far as the budget allocation between the social and economic sectors is concerned, at the policy level, it is seldom a question of exclusive choice. Thus, it is always a question of priorities according to different items of the expenditure 'on margin' and not of scraping one to favour the other (Dholakia & Dholakia 2004). In spite of all inefficiencies, corruption and poor delivery of publicly provided social goods; the government does matter and has a major role to play in the provision of social services to move faster towards the ideal level of basic welfare. This certainly does not mean that the private social sector is not important, but until we reach at certain threshold level of basic welfare, the coexistence of the government with the former, in the provision of social services, is advisable.

Conclusion and Policy Implications

In this study, a meticulous effort has been made to identify the performance of states in India in terms of basic welfare index. While much of this literature has focused attention on measurement issues involved in calculating the welfare index, the present study analysed the rate of reduction of disparity to consider the change in basic welfare rather than the level of basic welfare. PQLI method has been used as this method measures the desirable welfare in an economy also suggested by Dholakia and Dholakia (2004). However, it does not include the sanitation, poverty level and nutritional aspect human-being. In this study, BWI method encompasses all the four components of minimum desirable welfare, namely, housing and sanitation, health, education, nutrition and other indices. It is constructed through thirteen indicators, which are derived on the basis of standard welfare theory and also represents most significant variables of well-being of any society. These thirteen indicators are objective; measure output rather than efforts; have no ethnocentric biases; and do not assume any specific pattern of economic development. In order to study the role of the government in this respect, an econometric estimates showed a relationship between BWI and government efforts

is presented, specified and empirically tested with the data for 20 major states of India, using panel regression for the period 2000-01 and 2011-12.

Cross classification of states on the basis of their ranking in BWI and DRR showed that economically higher developed states like Gujarat and Haryana performed poorly in DRR. It indicates that despite being relatively higher developed in economic terms, they are lagging behind in terms of social and well-being indicators at the same time. Our results also indicate that the scale of basic welfare across the Indian states is diversified as Kerala, Himachal Pradesh and Tamil Nadu were the most affluent states while, Bihar, Jharkhand, and Odisha were the most disadvantaged. Econometric analysis based on panel regression showed that per capita NSDP on real prices and the share of expenditure on health and education were the important factors which determined the BWI. In addition to expenditure on health and education, the share of development expenditure to total expenditure along with per capita NSDP has a significant role on uplifting of BWI of Indian states. It shows that in spite of inefficiencies and corruption in publicly provided social goods, the role of the government in accelerating basic welfare seems to have remained important in India.

These findings have important implications for policy intervention to tackle the problem of poor wellbeing and low level of living of underperforming states of India in BWI. The results indicate that government policies related to social sector are not conclusive and its impacts across the state are uneven. The country has improved its position in several well-being indicators in absolute terms, however; still today, it is facing severe challenges in multi-dimensional nature of malnutrition and high level of poverty in many underperforming states, for example, Bihar, Odisha, Madhya Pradesh, Assam and Uttar Pradesh.

The study suggests that there is enormous scope of further research in analysing the performance of states in basic welfare indicators. This study allows us to gauge how particular states are improving their performance over time and how performance across different time periods has differed in the BWI. It suggests that policy should be framed on the basis of performance of states in the BWI and government should allocate more resources towards the destitute regions of the nation.

End Notes

1. Jharkhand is placed second in poverty ratio (37%) after Chhattisgarh (39.9%) in 2011-12.
2. See the Annexure Table-1A.

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Appendix

Table-1A : Economic Profile of Different States

State	NSDP [@] Per Capita	Population [#] Share	Share of [€] Agriculture & allied sector in Total GSDP	Unemp- loyment [£] Rate	Poverty ^{\$} Ratio
Andhra Pradesh	42,170	6.8	14.8	3.0	9.2
Assam	23,392	2.6	17.8	6.3	32.0
Bihar	15,506	8.8	16.5	8.3	33.7
Chhattisgarh	28,373	2.1	14.3	1.2	39.9
Gujarat	63,168	5.0	11.4	1.0	16.6
Haryana	67,260	2.1	14.4	3.2	11.2
Himachal Pradesh	54,494	0.6	14.0	3.1	8.1
Jammu & Kashmir	31,448	1.1	16.7	5.6	10.4
Jharkhand	28,882	2.8	13.7	4.8	37.0
Karnataka	46,012	5.0	11.3	2.5	20.9
Kerala	58,961	2.6	7.6	9.9	7.1
Madhya Pradesh	26,853	6.1	27.2	2.7	31.7
Maharashtra	69,097	9.2	6.0	2.8	17.4
Odisha	24,929	3.4	12.7	3.0	32.6
Punjab	49,529	2.3	19.7	1.8	8.3
Rajasthan	31,836	5.7	18.0	1.7	14.7
Tamil Nadu	62,361	5.9	6.3	2.2	11.3
Uttarakhand	59,161	0.8	7.6	5.2	11.3
Uttar Pradesh	19,233	16.6	20.2	2.5	29.4
West Bengal	36,293	7.5	13.1	7.8	20.0
India	39,904	100.0	14.1	3.8	21.9
Mean	41948	9.2	14.2	3.9	20.2
SD	17379	20.4	5.1	2.4	10.8
CV	0.4	2.2	0.4	0.6	0.5

Source : @ National Account Statistics, CSO, at 2004-05 prices for the year 2013-14

Estimated for the year 2016 based on data from Census of India, 2011

€ Agriculture Statistics at Glance based on Triennium Ending Year 2014 at constant prices.

£ National Sample Survey 68th round, Employment and Unemployment Schedule for the year 2011-12.

\$ Press Note on Poverty Estimates 2011-12, Planning Commission of India, New Delhi.

Impact of Foreign Financial Inflows on Reserve Bank of India's Credit Policy

Manjinder Kaur* & Sharanjit S. Dhillon**

This paper investigates reaction of Indian credit policy to foreign financial inflows. For this sterilisation coefficient which measures degree of independence of domestic credit policy is calculated by analysing monthly data from April 1993 to March 2015 on net foreign exchange assets, net domestic assets, index for industrial production, wholesale price index as endogenous variables. The results of error correction model exhibited the value of sterilisation coefficient as (-0.84) which implies partial sterilisation of domestic credit to control increase in inflation as a result of foreign financial inflows. The study concludes that domestic credit policy of India is neither completely independent nor fully sterilised from the impact of foreign financial inflows.

Keywords : Net Domestic Assets, Net Foreign Exchange Assets, Sterilisation Coefficient, Offset Coefficient.

Introduction

The huge volume of capital inflows affects domestic monetary policy via appreciation of exchange rate. Growth in capital inflows may result in either accumulation of foreign exchange reserves or current account deficit depending upon exchange rate regime. In case of floating exchange rate regime increase in capital inflows would lead to widening current account deficit. But, if the exchange rate regime is fixed one, then central bank of the country would intervene to offset the appreciation in exchange rate. This intervention of central bank in determination of exchange rate will be reflected in accumulation of foreign exchange reserves.

Although in India, exchange rate regime is floating one, however, the trend in accumulation of foreign exchange assets with RBI clearly indicates that from time to time RBI has aggressively intervened in determination of exchange rate of Indian rupee. Thus, flexibility permitted by RBI for free determination of exchange rate of Indian rupee has been a restricted one. Under the pressure of open economy dynamics, the smooth conduct of monetary policy

* Dr. Manjinder Kaur, Assistant Professor, PG Department of Commerce, Guru Nanak Dev University College, Chung, Tarn Taran, Punjab, India-143304.

** Dr. Sharanjit S. Dhillon, Professor, Punjab School of Economics and Former Registrar Guru Nanak Dev University, Amritsar, Punjab, India-143005.

has become a real challenge. The interlinkage between exchange rate of Indian rupee on the one hand and capital inflows on the other is directly in conflict with independent monetary policy aimed at stabilising domestic economy.

Under open economic system, with unprecedented capital inflows, central bank will have to attain the twin objectives of resisting exchange rate appreciation and also at the same time controlling inflation. But central bank's intervention in foreign exchange market to prevent currency appreciation would be in direct conflict with credit policy of the country to control inflation. Thus, under the open economic system, a real challenge that a central bank has to face is to co-ordinate its intervention in exchange rate determination with its credit policy. This co-ordination could be achieved by means of sterilisation. But practically full co-ordination of sterilisation with credit policy is hard to achieve. This has been supported by many earlier studies. Mundell's idea of 'impossible trinity' states that no country can simultaneously have an open capital account, a fixed exchange rate regime and a monetary policy targeted on domestic economy (Mundell, 1961). Thus, once capital account is open and exchange rate is fixed one, monetary policy is driven solely by the need to uphold the fixed exchange rate.

Reserve Bank of India (RBI) and Sterilisation

In the light of foreign exchange inflows, RBI focused on sterilisation measures to prevent appreciation of exchange rate of rupee. Sterilised intervention of central bank is a combination of two transactions. Firstly, a sterilised intervention is exercised by buying foreign currency with home currency which leads to increase in monetary base. Then central bank sterilises the effect of increased monetary base by selling an equivalent quantity of home currency denominated bonds to soak up the increased monetary base.

As a move toward sterilisation in the light of heavy capital inflows Reserve Bank of India, reduced the availability of credit to its domestic agents. Major domestic agents of RBI consist of RBI's claims against Government and commercial sector. These domestic agents constitute domestic assets of RBI. Credit to various domestic agents of RBI is presented in Table-1.

Total reserve money of RBI thus consists of Net Domestic Assets (NDA) and Net Foreign Exchange Assets (NFEA). Table shows that ratio of commercial sector credit to reserve money has declined from 5.60 per cent in March 1993 to .76 in March 2015. Similarly, Government consumption to Reserves ratio (G/Res) has also

Table-1 : Credit to Various Domestic Agents of RBI

(₹ Billion)

Year	RBI Claims on		Ratios				
	Government	Commercial Sector	Reserve Money	NFEA	NFEA/ Res	CS/ Res	G/ Res
1993	984.49	62.20	1107.79	226.47	20.44	5.61	88.86
1994	993	64.45	1386.72	514.22	37.08	4.64	71.60
1995	1014.78	65.93	1692.83	747.2	44.13	3.89	59.94
1996	1213.49	68.55	1944.57	740.92	38.10	3.52	62.40
1997	1241.81	62.47	1999.85	948.17	47.41	3.12	62.09
1998	1351.6	81.86	2264.02	1158.9	51.18	3.61	59.69
1999	1525.39	122.26	2592.86	1379.54	53.20	4.71	58.83
2000	1482.64	152.70	2805.55	1658.8	59.12	5.44	52.84
2001	1538.77	132.87	3032.95	1971.87	65.01	4.38	50.73
2002	1521.78	59.29	3379.52	2639.79	78.11	1.75	45.02
2003	1206.8	30.48	3690.38	3582.49	97.07	0.82	32.70
2004	449.08	20.61	4364.90	4844.19	110.98	0.47	10.28
2005	-179.75	13.90	4891.11	6127.95	125.28	0.28	-3.67
2006	65.99	13.87	5719.32	6729.86	117.66	0.24	1.15
2007	24.23	15.37	7088.61	8661.52	122.18	0.21	0.34
2008	-1132.09	17.88	9282.75	12361.31	133.16	0.19	-12.19
2009	615.8	138.2	9879.61	12801.08	129.57	1.39	6.23
2010	2115.86	13.28	11556.53	12319.44	106.60	0.11	18.30
2011	3965.55	21.64	13768.21	13285.69	96.49	0.15	28.80
2012	5357.37	39.60	14263.44	14721.95	103.21	0.27	37.56
2013	5905.78	30.58	15148.86	15580.59	102.84	0.20	38.98
2014	6987.08	88.39	17327.42	18025.25	104.02	0.51	40.32
2015	3645.23	148.47	19284.63	21272.79	110.30	0.76	18.90

Source : 2015-16, Handbook of statistics on Indian Economy, RBI, Mumbai.

Note : Values in Table are as on 31st March of each year.

declined from 89 per cent in March 1993 to 18.90 per cent in March 2015. The rate of fall in commercial sector credit has been drastic and turned out to be almost negligible. RBI credit to Government has declined substantially by imposing strict control over monetisation of Government deficit. The ratio of NFEA/Res i.e., net foreign exchange assets to RBI reserves has increased from 20.40 per cent in March 1993 to 110.30 per cent in March 2015. It further implies aggressive sterilisation efforts of RBI.

Review of Literature

To explore the objectives of conducting study to test independence of Reserve Bank of India's credit policy, a brief review of literature with respect to impact of foreign financial inflows on credit policy is being presented. According to Mundell (1961) a key insight of open economy macroeconomics is the idea of 'impossible trinity'. The theory of '*impossible trinity*' states that no country can simultaneously have an open capital account, a fixed exchange rate regime and a monetary policy targeted on domestic economy. Impossible trinity is a situation in which a country tries to achieve all the three objectives. Thus, once capital account is open and exchange rate is fixed one, monetary policy is driven solely by the need to uphold the fixed exchange rate.

Sau (1994) has scrutinised, the role of foreign direct investment and foreign portfolio investment in effecting the stability of the macroeconomic system in the economy of the recipient country. The study explained that foreign capital comes in two forms : Direct Foreign Investment (DFI) and Foreign Portfolio Investment (FPI). The two are qualitatively different. The immediate impact of foreign direct investment is on goods market, whereas that of foreign portfolio investment is felt more strongly in the asset market. With the opening of capital account the prevailing high interest rates attracted volumes of Foreign Portfolio Investment (FPI). As a result, the domestic currency appreciates, exports decline and balance of payments deteriorate.

Bhagwati (1998) is of the view that full capital mobility is not a necessary condition for free trade. The study argues that government should restrict the global flow of capital even while vigorously promoting free trade in goods and services. The study cautions that any nation contemplating to embrace of free capital mobility must consider its costs and also considers the probability of running into crisis. It further adds that even if one were to believe that capital flows are generally productive there is still an important difference between embracing free portfolio capital mobility and a policy of attracting equity investment.

Rangarajan (2000) revealed that importance of capital inflows to developing countries is well understood. Financial markets around the world are getting integrated. This process has been helped by deregulation, information technology and increasing role of institutional investors to invest internationally. The study suggested that opening up of capital account need not preclude the imposition of moderate controls, either price based or regulatory on capital flows. Controls should be selective designed to achieve specific objective of containing speculation flows. Asian crisis is not an agreement against capital account liberalisation. Capital account liberalisation is not a discrete event rather it is a process and should be in stages. Saha (2000) observed that foreign investment inflows into India have increased after the 1990s that is especially after the pre-reform period. The study made an attempt to analyse the effect of external financial flows on the domestic financial system. According to study during the period of 1990 to 1999, Reserve Bank of India intervened aggressively in the foreign exchange market as a net purchaser of the greenback, resisting the absorption of capital inflow and building up its reserves. RBI has played its crucial role in lowering the interest rates by reducing the bank rate. However, during the period of financial crisis in foreign exchange market, RBI had to raise the

interest level to tighten its monetary policy which may further attract heavy financial inflows from abroad. Consequently to squeeze the inflationary pressure of these capital inflows, RBI indulged in sterilisation measures to offset expansionary impact of its forex market intervention on monetary system, by discontinuing traditional credit lines available to various domestic agents which in turn might adversely affect the real sector of the economy due to non-availability of desired credit to accelerate the income generation level from productive assets.

According to Kohli (2001 a) composition of flows make a significant difference both in terms of impact and smooth management. Portfolio flows because of their short-term nature can cause uneven expansion and contraction in domestic liquidity and thus have a greater impact upon stock market and expansion in money supply and domestic credit. Foreign direct investment is less volatile because of their long-term nature. The distribution of capital flows between foreign portfolio and foreign direct investment flows into India tilts distinctly towards foreign portfolio investment in most of the years after liberalisation. Foreign direct investment does not reveal a stable trend so far. India is gradually liberalising its capital account and the issue of free capital out flow is controversial. Kohli (2001 b)

analysed that capital inflows impact upon domestic money supply through accumulation of net foreign currency assets with central bank. The interaction between capital flows and domestic money supply however needs to be formally investigated in depth as a monetary expansion implies inflation. There are some constraints of fiscal led monetary expansion in India which raise aggregate demand and aggravate the inflationary impact of capital inflows. The macroeconomic policy response during such a surge in capital inflows to counter their inflationary impact and lower aggregate demand is to exercise fiscal restraint. This option is however rarely exercised since fiscal policy is usually set according to medium and long-term projections and thus it is difficult to use fiscal policy effectively for immediate effects to control inflationary pressures. Whether, the monetary base is altered or not depends upon the fact that whether the central bank intervenes to maintain a fixed exchange rate or allows it to float freely with no intervention. If there is intervention by the central bank, then an accumulation of international reserves represents an increase in the net foreign exchange assets of the central bank and directly affects the monetary base. In India monetary reserve's accumulation is neutralized primarily through reserve requirement change on commercial

bank's liabilities. These pressures complicate macroeconomic management since the only variable that can be varied under these circumstances to control inflation or to adhere to monetary policy objectives is domestic private sector. This clearly implies a major area that needs to be explored in depth, is to determine the costs associated with sterilisation which would be valuable input to determine the extent to which sterilisation policies should be used. Patnaik (2004) estimated offset coefficient for India using monthly data for the period April 1993 to December, 2003. The non-official capital inflows stagnated at roughly 09 percent till 1991-92. The reforms in India since 1990s observed a significant opening of the current and capital account led to rise in non-official capital inflows which has however created new challenges for the implementation of pegged exchange rate regime. The results of Vector Error Correction model indicate offset coefficient to be 0.60. Thus, result suggests that RBI directly intervened in currency market by a reduction in net domestic assets. The relationship of output growth with net domestic assets has been found to be positive and highly significant. However, thought the extent of sterilisation was large but is was not complete. Following the opening up of the capital account, India experienced a combination of developments in

episode 1999-2000 to 2003-04. Firstly, the capital inflows were partially sterilised, secondly Cash Reserve Ratio (CRR) was reduced with a steady pace and thirdly output growth also slowed down during this period. According to Jan, Elahi and Zahid (2005) State Bank of Pakistan (SBP) had successfully managed the massive foreign exchange inflows in the recent years. Sterilisation policy has proved effective in offsetting the expansionary impact of these foreign exchange inflows on Reserve Money (RM), money supply (M_2), exchange rate and prices. The sterilisation coefficient for Pakistan during July 2000-December 2003 has been estimated at (-) 0.87 which, indicates that 87 per cent increase in Net Foreign Exchange Assets (NFEA), was effectively sterilised. SBP intervened in the foreign exchange market to prevent Pak Rupee from undue appreciation. For sterilisation, SBP made outright sale of government securities (mainly T-Bills) through auctions. It was supplemented by Open Market Operations (OMOs) to manage liquidity in the banking system. However, SBP left enough money in the market to push a downward pressure on domestic interest rate in order to boost and maintain the momentum of economic growth. The study found that sterilisation through auction/open market operations (OMO) is not feasible due to limited stock of government

securities. Therefore, alternative instruments should be explored. SBP may consider issuing its own short-term paper to mop-up excess liquidity from the market. (2) There is a need to promote the depth of financial markets especially a well organised foreign exchange market to absorb foreign exchange inflows in a smooth manner without allowing adverse impact on exchange rate and price stability. (3) Liquidity-forecasting framework should be further strengthened to assess the short-run liquidity position in an objective manner, so that pro-active and timely decisions could be taken to avoid liquidity crisis. Mohan (2005) revealed that flows of private capital through foreign institutional investors have in recent years augmented forex reserves in emerging markets and boosted capital markets. FIIs have displaced domestic mutual funds in importance in the equity market. Their shareholding in the Sensex companies is large enough for them to be able to move the market. The size of inflows could vary and this itself could lead to market volatility. But such variations are unlikely to be destabilising in nature. The real problem due to variations in FIIs inflows from year to year is not of stock market volatility but difficulties in the management of money supply and exchange rate.

According to Sen (2007) macroeconomic policy-making came into India during

the 1980s as a result of lifting up the government controls on economic activity. This was a period of relatively high growth accompanied by rising fiscal deficits. As in many other emerging markets, financial repression was used by the government to corner a high proportion of savings to meet its demand for funds. The banks were required to hold, in addition to the usual Cash Reserve Ratio (CRR), a certain percentage of their assets in the form of government securities, known as the Statutory Liquidity Ratio (SLR). Borrowing and lending rates were administered rather than market determined. The study further revealed that since the early 1990s the Indian economy has seen a considerable relaxation of controls, as a consequence of which it has witnessed unprecedented growth. This is especially remarkable in the external sector. The study evaluated the progress made on the macroeconomic front and addressed the possibility of opening up the capital account of the balance of payments. The study suggested that given the weakness in the financial sector and the government finances, it may be dangerous to speed up the process of opening up the capital account further. An economy with an unsustainable fiscal policy may find that it is unable to borrow following an opening up of outflows or the terms on which it borrows become very

unfavourable as capital flows out. This then leads to an expectation of monetisation of the deficits causing a rapid currency depreciation that, in turn, causes a financial crisis. If the exchange rate is fixed then this expectation of a future monetisation could cause the peg to collapse and a large depletion of foreign exchange reserves. According to this study, "surprise" inflation, of course, benefits the government and borrower in that it reduces the real value of the debt. This, however, is not true of an economy like India where most debt is held by the financial institutions owned by the government. There are areas of weakness particularly in macroeconomic context that need be addressed. Particularly the fiscal and banking problems are serious. Under these circumstances, rushing into embracing capital account convertibility could prove fatal. Waheed (2007) examined the response of State Bank of Pakistan to foreign exchange inflows for the period of Jan, 2001 to Aug, 2006 using Vector Auto Regression (VAR) model to account for the issue of endogeneity of the domestic credit with foreign exchange interventions. The study also analysed the role of foreign and domestic interest rate differentials in pulling in or pushing out of these foreign exchange flows. The results of Vector Autoregressive model indicated that the offset coefficient (-0.16) is very small and insignificant

implying that changes in credit resulted in very small offsetting of foreign exchange inflows. The sterilisation coefficient estimated at -0.50 confirms that SBP only partially sterilised the foreign exchange inflows. Thus over the period of the study State Bank of Pakistan (SBP) has only partially sterilised the inflows. Results have further shown that inflows were neither pulled into the country due to high domestic interest rates due to some domestic policy nor they were pushed into the country owing to low interest rates abroad. It has been observed that during the period of the study, State Bank of Pakistan's (SBP's) domestic credit policy was in no conflict with its intervention in forex market.

In the light of above studies, there is a need to estimate the impact of foreign capital inflows on availability of credit to domestic agents of RBI and consequent encroachment of autonomy of credit policy. The autonomy of credit policy is estimated by calculating sterilisation coefficient using high frequency (monthly) data.

Objectives of the Study

The specific objectives of the study are :

- To analyse the impact of foreign capital inflows on availability of credit to commercial sector and government sector.

- To estimate coefficient of sterilisation for RBI's credit policy.

Data base and Methodology

The extent of sterilization of monetary policy has been estimated using monthly data from April 1993 to March 2015 consisting of Net Domestic Assets (NDA) which is the difference between Reserve money and Net Foreign Exchange Assets of RBI, Net Foreign Exchange Assets (NFEA), Whole sale Price Index (WPI) and Index of Industrial production (IIP). All the variables have been considered in logarithm form. To ascertain the order of integration is the pre requisite for almost all the econometric models and same has been determined using Augmented Dickey Fuller (1979) unit root test. A data series is stationary if mean and variance are constant (not changing) over time and the value of covariance between two time periods depends only on the distance or lag between the two time periods and on the actual time at which the covariance is computed. The correlation between a series and its lagged values are assumed to depend only on the length of the lag and not the starting point of the series. A series observing these properties is called a stationary time series. It is also referred to as a series that is integrated of order zero $I(0)$. The unit root test checks whether a series is stationary or not. For this the

following types of Augmented Dickey Fuller (ADF) regression has been applied :

$$\Delta Y_t = \alpha_1 Y_{t-1} + \sum_{m=1}^n \beta_m \Delta Y_{t-m} + \mu_t \dots (1)$$

$$\Delta Y_t = \alpha_0 + \alpha_1 Y_{t-1} + \sum_{m=1}^n \beta_m \Delta Y_{t-m} + \mu_t \dots (2)$$

Where, μ_t is white noise. The equation (1) is without intercept but equation (2) is with intercept. The additional lagged terms have been included to ensure that errors are uncorrelated. The following hypotheses have been tested by applying unit root tests :

H_0 : Y_t is not I (0) i.e., [Y_t is not integrated of order zero].

H_1 : Y_t is I (0) i.e., [Y_t is integrated of order zero].

If the calculated ADF statistics are insignificant then the null hypothesis (H_0) is accepted and the series are taken as non-stationary or not integrated of order zero. Hence, unit root exists. Alternatively, if the calculated ADF statistics are significant then the alternate hypothesis (H_1) is accepted and the series are taken as stationary or integrated of order zero. Hence, unit root does not exist.

To estimate the domestic credit policy reaction function firstly all the variables have been tested for stationarity using

Augmented Dickey Fuller Unit Root Test. If all the series turn out to be integrated of the same order I(1), Engle and Granger (1987) method can be applied for testing co integration.

The extent of sterilization of monetary policy has been estimated by using the following monetary policy reaction function by applying Engle and Granger (1987) model :

$$NDA = \alpha_0 + \alpha_1 NFEA + \alpha_2 WPI + \alpha_3 IIP + \mu \dots (3)$$

Co-integration test is necessary to examine if the linear combination of all non-stationary series is stationary. For this residuals derived from equation (3) estimated at levels have been tested for stationarity. To test the stationarity of residuals ADF values as provided by Engle and Granger (1987) have been considered.

If residuals turn out to be stationary at levels it implies the existence of long-run relationship and co integration.

Finally to estimate short-run dynamics NFEA, NDA and IIP have been considered in first differenced form along with one time lagged residuals from equation estimated at levels. The coefficient of one time lagged residuals (Error-correction term) will represent the speed of adjustment toward equilibrium.

The error correction model as estimated to obtain short-run dynamics and speed of adjustment is specified below :

$$\Delta NDA = \beta_0 + \Delta NFEA + \Delta IIP + \dots + ECT_{-1} \quad \dots(4)$$

where Δ represents first differences of the concerned variables. The coefficient of ECT_{-1} will represent speed of adjustment and should be negative and significant.

Further, in the models so discussed serial correlation in residuals has been checked by Durbin-Watson statistic.

Durbin-Watson (DW) Statistic

The Durbin-Watson statistic has been applied to measure serial correlation in the residuals of the estimated model by applying following formula :

$$DW = \frac{\sum_{t=2}^T (\hat{\varepsilon}_t - \hat{\varepsilon}_{t-1})^2}{\sum_{t=1}^T \hat{\varepsilon}_t^2}$$

Where $\hat{\varepsilon}_t$ stands for residuals from the estimated model, $\hat{\varepsilon}_{t-1}$ are one time lagged residuals from the estimated model and T is the number of observations. As a rule of thumb, the value of DW statistic should be close to 2 i.e. neither less than two nor greater than 2 if the residuals are not serially correlated. Besides this Lagrange Multiplier (LM)

test has also been considered to diagnose serial correlation in residuals of estimated models.

Diagnostic Analysis

Residual analysis has been performed for diagnostic checking of the estimated time series models by testing these models for no heteroscedasticity, no autocorrelation and non-normal errors. The null hypothesis (H_0) and alternate hypothesis (H_1) for this are specified below :

Heteroscedasticity

H_0 : Homoscedasticity which states that the variance of error terms is constant.

H_1 : Heteroscedasticity which states that the variance of error terms is not constant.

Autocorrelation

H_0 : No serial correlation in error term.

H_1 : Error terms are serially correlated.

Normality Test

H_0 : The error term follows normal distribution.

H_1 : The error term follows normal distribution.

Empirical Analysis

The extent of sterilisation of monetary policy aimed at preventing rupee appreciation in terms of dollar and to

control inflation has been estimated econometrically by using Engle and Granger (1987) model the following monetary policy reaction function :

$$\text{Log NDA} = \alpha + \alpha_0 \text{Log NFEA} + \alpha_1 \text{Log WPI} + \alpha_2 \text{Log IIP} + \mu_t$$

NDA : Net Domestic Assets – difference between reserve money and net foreign exchange assets of RBI

NFEA : Net Foreign Exchange Assets

WPI : Wholesale Price Index

IIP : Index for Industrial production

To estimate the above stated domestic credit policy reaction function firstly all the variables have been tested for stationarity. The results of Augmented Dickey Fuller Unit Root test are presented in Table-2. This table clearly indicates that all the variables NDA, NFEA,

IIP and WPI are integrated of order I (1) considering ADF values with trend and intercept since all the series are non-stationary at levels but their first differences are stationary.

Having observed that all the series are integrated of the same order I (1), Engle and Granger (1987) method has been applied for testing cointegration. Co-integration test is necessary to examine if the linear combination of all non-stationary series is stationary. For this following Domestic credit policy reaction function is estimated at levels :

$$\text{Log NDA} = 2.41 - .67 \text{Log NFEA} + .59 \text{Log IIP} + U_t$$

$$R \text{ Square} = .89 \text{ Adjusted R Square} = .87$$

WPI has been dropped since it has sign opposite to that anticipated and also insignificant at levels. Residuals derived from the equation estimated at levels

Table-2 : Augment Dickey Fuller Unit Root Test for NFEA, NDA, IIP and WPI

Series	At Levels		First Differences	
	Without Intercept and Trend	With Trend and Intercept	Without Intercept and Trend	With Trend and Intercept
NFEA	8.13	-3.33	-4.75*	-8.75*
NDA	-1.41	-3.05	-4.97*	-8.78*
IIP	1.98	2.83	.35	-3.44**
WPI	5.18	-2.45	-6.61*	-8.90*

* significant at 1% level of significance. ** significant at 5% level of significance.

have been tested for stationarity and found to be stationary at levels. It implies the existence of long-run equilibrium and cointegration.

To estimate short-run dynamics NFEA, NDA and IIP are considered in first differenced form along with one time lagged residuals from the equation estimated at levels. The coefficient of one time lagged residuals Error-Correction Term (ECT) represents the speed of adjustment toward equilibrium. Following error-correction model has been estimated which represents short-run dynamics and speed of adjustment :

$$DNDA = 0.02 - .84*DNFEA + .10*DIIP - .18*ECT$$

(3) (-16) (3.04) (-5.05)

* significant at 1 per cent level of significance. Figures in parenthesis are t values.

R square = 0.89 Adjusted R square = 0.87

The coefficient ECT representing the speed of adjustment is negative and significant implying that 18 per cent of the

deviations from equilibrium are corrected every month. The coefficient of IIP is also positive and significant as anticipated. These results of error correction model that RBI intervenes in foreign exchange market to control inflationary impact of capital inflows and 84 per cent of the capital inflows have been sterilised by accumulating Net Foreign Exchange Assets (NFEA). This process has an impact of controlling inflation and rupee appreciation subsequent to capital inflows. The value of coefficient of sterilisation (-0.84) implies that sterilisation has occurred by purchase of foreign currency worth Rupees 100 by selling government securities worth Rs. 84. In order to diagnose the results of Engle and Granger (1987) model, three tests namely no serial correlation, no ARCH, no heteroscedasticity in residuals have been applied.

Table-3 shows that in estimated model for the above stated domestic credit policy reaction function, there is no serial correlation and heteroscedasticity since F statistic is insignificant. Also there is no ARCH in estimated model.

**Table-3 : Diagnosis Analysis of Engle and Granger (1987)
 Model for Domestic Credit Policy Reaction Function**

Desired Test	F-Values	P-Values
ARCH test	F = .12	P =.87
Heteroscedasticity Test	F = .68	P =.65
Serial correlation test	F = .87	P =.41

Hence, model has been correctly specified. Thus following liberalisation of capital inflows, RBI's credit policy is not completely independent but is sterilised one. Moreover, it is partially sterilised with high degree of sterilisation of more than .60.

On the basis of this analysis, it can be concluded that eventually growth of foreign exchange inflows has an impact on domestic credit and also credit policy is driven by the objective of preventing exchange rate appreciation than its objective to control inflation. As a result of these sterilisation measures, the competitive strength of Indian industry is also likely to suffer since these sterilisation measures result in cutting down the various traditional lines of credit available to real sector which is the major domestic agent of the RBI.

Conclusion

It has also been observed that as an effort toward management of huge capital inflows, RBI has followed sterilisation measures and piled-up foreign exchange reserves to save the economic system against the inflationary impact of these capital inflows. The ratio of commercial sector credit to reserve money has declined from 5.60 per cent in March 1993 to 0.76 in March 2015. Similarly, Government consumption to Reserves ratio (G/Res) has also declined from 89

per cent in March 1993 to 18.90 per cent in March 2015. The rate of fall in commercial sector credit has been drastic and turned out to be almost negligible. RBI credit to Government has declined substantially by imposing strict control over monetisation of Government deficit. The ratio of NFEA/Res i.e., net foreign exchange assets to RBI reserves has increased from 20.40 per cent in March 1993 to 110.30 per cent in March 2015. It implies aggressive sterilisation efforts of RBI. On the basis of this analysis, it can be concluded that eventually growth of foreign exchange inflows has an impact on domestic credit and also credit policy is driven by the objective of preventing exchange rate appreciation than its objective to control inflation. Further, results of error correction model that RBI intervenes in foreign exchange market to control inflationary impact of capital inflows and 84 per cent of the capital inflows have been sterilised by accumulating Net Foreign Exchange Assets (NFEA). This process has twin impact of controlling inflation and rupee appreciation in response to capital inflows. The coefficient of sterilisation (-0.84) implies that sterilisation has occurred by purchase of foreign currency worth Rupees 100 by selling government securities worth ₹84. As a result of these sterilisation measures, the competitive strength of Indian industry is

also likely to suffer since these sterilisation measures result in cutting down the various traditional lines of credit available to real sector which is the major domestic agent of the RBI. No doubt, sterilisation is being used to offset the effect of foreign capital inflows and avert the home currency appreciation but use of sterilisation does not completely help in the desired direction. Sterilisation policies pose several threats and are a controversial issue. Firstly, to exercise sterilisation, interest rates on domestic currency assets should be high enough to control the central bank losses out of interest rate differentials arising out of interest paid on external debt. This in turn would attract further more capital inflows causing potential destabilisation.

Secondly, sterilisation through reserve requirement changes is often exercised. But this practice will be successful only if whole of the capital inflows are intermediated through banking system. However, in India significant proportion of capital inflows is being channelized through stock markets by means of foreign institutional investors' investment in equity shares and bonds. The more developed the financial sector, the more effective will be the sterilisation measures through open market operation or reserve requirement changes. Since, Indian financial sector is in its evolutionary stage which

causes dilution of banking sector, then how far reserve requirement changes or open market operations as tool of sterilisation will be successful?

Thirdly, in this era of gradual liberalisation of capital account of India, capital inflows which can also be used as a sterilisation measure are still restricted mainly on account of protection of rupee from speculative attack which may cause potential instability by depleting foreign exchange reserves.

To address these threats of sterilisation following measures are suggested :

- A vibrant and effective stock market for both government and private securities is necessary for the success of sterilisation.
- Another tool to deal with this problem of averting the adverse impact of foreign capital inflows is to exercise capital controls especially in short term tough times and these may be again eased in smooth times.
- Government credit should be cut down instead of private credit so that private sector may come up with economic growth.
- In nutshell, it can be said that to counter the adverse impact of capital inflows on rupee volatility, use of any single sterilisation measure may further aggravate the problem

and harm the macroeconomic stability. Hence, a comprehensive policy package is suggested to minimise the threats of sterilisation and successfully respond to the pressure of foreign capital inflows.

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A Study on Exploring the Diversified Stakeholder's Response in Adopting Change Management Practices to Implement Privatization Policy

Virupaksha Goud G* & Vinod Puranik**

This study makes an attempt to explore the demographically diversified different stakeholder's opinion on application of change management practices to implement privatization policy. Demographics such as gender, age, education, work experience, profession and geographical region are considered for this study. The survey adopted standard questionnaire developed and published by the Authors and identified as 'VG-VP Change management practices response measurement scale'. The standard questionnaire contains 8 change management dimensions with 45 items. Out of 45 items, 26 items are cause factors and remaining are effect factors. The study considered PSU employees as primary stakeholders and general public and students are secondary stakeholders. Data was collected from 696 samples for examining the response to policy changes. The primary objective is to evaluate samples response to change management factors while implementing change. Primary stakeholder sample selected from 3 different public sector enterprises in and around Bangalore city in Karnataka. Secondary stakeholder sample selected from different geographical regions of Karnataka. The results of the study revealed that education levels and experience of the different stakeholders have a significant effect on their opinion. Among the change management variables, the programme name component has a difference of opinion among different stakeholders. The study explains inferential statistics using Mann-Whitney-test and Kruskal-Wallis test. Normality test was conducted before choosing specific test.

Keywords : Stakeholder Response to Privatization, Change Management Practices in Privatization, Public Response to Disinvestment and Policy Change, Diversified Demographic Response to Privatization, Change Management Practices Response Measurement Scale.

Introduction

Change management is a popular concept in business management and widely practiced in organizations to implement change as per the change in

* Dr. Virupaksha Goud, MBA Department, Acharya Institute of Technology, Bangalore.

** Dr. Vinod Puranik, Department of Industrial Production and Engineering, Basaveshwar Engineering College, Bagalkot.

the business environment. Privatization is a change from investment to disinvestment at government level. Since the last 3 decades, large number of the countries in the world is implementing privatization, this change from investment to disinvestment or privatization is facing resistance and opposition from many stakeholders (John Nellis, Savas et al). It encompasses a variety of aspects such as ideology, politics, economics, finance and social aspects in the global context. Implementation of this economic concept has become difficult due to varied kind of opposition and challenges. This paper is investigating stakeholder response to change management practices while implementing privatization.

Few economists and researchers have always tried to understand the important variables which influence on people and labour support for privatization. However, the literature review indicates that stakeholder demographics are among the most important factors which influence the acceptance and support in favor of privatization, but it has not drawn much attention of researchers and academicians. Hence, the present study is focused on exploring the effect of the different stakeholder's demographics such as gender, age, qualification, and work experience on their support in favor of privatization.

Review of Related Literature

Privatization literature is more associated with its effects on economics and finance dimensions of the policy. Stakeholders consent for the privatization policy is less discussed and limited literature is observed in the literature survey. Mahmoud Ahmed Mahmoud El Agamy (2011) examined whether employees opinion changed as a result of the communication process during privatization. His survey observed that effective communication during privatization implementation contributed to the smooth operation of the privatized firm. Author claims that communication on issues like job security, work environment, corporate culture, and reasons for privatization, remuneration plans, work procedures and benefit packages is very much necessary to gain the confidence of employees and for successful transformation. Okechukwu Dominic Nwankwo & Uche G Akam (2011) found that employees support for privatization as they are frustrated by political economy of government. Student's opinion on privatization is less found in the existing literature. In one of the study conducted in Saudi Arabia, 71 per cent (out of 762 sample) of the student respondents believe that privatization of state-owned enterprises is best for the local economy (Obaid A Al modaf, 2003). Students are the future citizens and job aspirant and can

become change agents. Public opinion on privatization policy is also less studied. Paul Battaglio (2009, 2005) observed that in selected European countries the country and individual values influences on supporting the public sector versus private sector as a choice of preference. Author observed that public opinion depends on utilitarian choice, leadership, government, party preference, value orientation, government economic role and political effectiveness.

Statement of Problem

Based on the empirical and theoretical facts provided in the above literature, it is evident that demographically diversified different stakeholders variables such as gender, age, qualification and work experience of individuals might have a significant effect on their acceptance and support in favor of privatization. The effect of stakeholder's responses on application of change management practices is unknown. Hence, the present research focuses on studying whether the demographically diversified stakeholder factors such as (a) gender, (b) age, (c) qualification, and (d) work experience have any significant effect on their acceptance and support in favour of privatization?.

Objective of the Study

To explore the effect of the demographically diversified different stakeholder's response towards application

of change management practices while privatization of public sector enterprises.

Hypothesis

H1o : There is no significant difference of opinion between different gender groups on the cause factors of VG-VP change management practices response measurement scale.

H2o : There is no significant difference of opinion between different gender groups on the effect factors of VG-VP Change management practices response measurement scale.

H3o : There is no significant difference of opinion among different geographical region respondent on cause factors of VG-VP change management practices response measurement scale.

H4o : There is no significant difference of opinion among different geographical region respondent on the effect factors of VG-VP change management practices response measurement scale.

H5o : There is no significant difference of opinion among different age group respondent on cause factors of VG-VP change management practices response measurement scale.

H6o : There is no significant difference of opinion among different age group responses on effect factors of VG-VP

change management practices response measurement scale.

H7o : There is no significant difference of opinion among different Education Group respondent on cause factors of VG-VP change management practices response measurement scale.

H8o : There is no significant difference of opinion among different education group respondent on effect factors of VG-VP change management practices response measurement scale

H9o : There is no significant difference of opinion among different experience group respondent on cause factors of VG-VP change management practices response measurement scale.

H10o : There is no significant difference of opinion among the different experience group responses on effect factors of VG-VP change management practices response measurement scale.

H11o : There is no significant difference of opinion among different profession group responses on change factors of VG-VP change management practices response measurement scale.

H12o : There is no significant difference of opinion among different profession group responses on effect factors of VG-VP change management practices response measurement scale.

Research Methodology

In this research, both exploratory and descriptive research designs have been used. The exploratory research design was used to get more insights and understanding about the different variables pertaining to change management practices. The personal interviews were conducted with the employees of public sector employee's to qualitatively investigate the effect of change management practices on stakeholder's personnel's demographics on their opinion on privatization. The descriptive research design was mainly employed to test the research hypotheses and examine the stakeholder's opinion on application of change management practices to implement privatization. As indicated above the survey instrument used in the study was a standard questionnaire adapted from "A Multidimensional Subjective Scale Development for Exploring the Application of Change Management Practices to Implement Privatization Policy" developed by Virupaksha Goud & Vinod S Puranik (2016). Collected data analyzed using SPSS 20 version. The questionnaire consists of 26 items on change management variables (cause variables) and 19 items on responses to cause variables (effect variables) measured on a five point rating scale. Detailed dimensions and items of the scale mentioned below.

Change Management Concepts	Cause Items	Effect Items	Total Items
Economic awareness	5	3	8
Name of the Policy / Program	6	2	8
Communication about policy	3	2	5
Confidence about future	3	2	5
Negotiation plan	3	2	5
Participation plan	2	2	4
Incentives	2	4	6
Coercion	2	2	4
Total items	26	19	45

Data Normality Test

Kolmogorov Smirnov test for normality showed that cause factors of the scale are slightly skewed as skewness values lies between -1.67 to -0.880. For K-S test, the P value is less than 0.05; hence the data may be observed as non-normal distribution and requires application of non-parametric tests (Saunders, Lewis & Thornhill, 2007). Effect factors are in the scale are also slightly skewed as skewness values lies between -1.463 to -0.718. Since the P value is less than 0.05, data may be observed as non-normal distribution and requires application of non-parametric tests.

Inferential Statistics

Inferential statistics is a way of bringing out inferences about the research and its variables by using the sample responses. Mann–Whitney test and

Kruskal-Wallis Test are used to draw inferences about the sample under study.

Mann-Whitney Test : In this study Mann-Whitney test is applied on gender independent variable to test the significance of difference between two means of different gender. The interpretation rules of the Mann-Whitney test indicates that when the p value is less than or equal to 0.05 ($p \leq 0.05$) then test is statistically significant and shows difference between the groups with regards the variable of interest else test is statistically insignificant.

In the above Mann–Whitney test table, change management cause variables such as awareness, communication, policy naming, confidence, participation, negotiation, benefits and coercion have their p value greater than 0.05 hence test is statistically insignificant for all cause variables and can be claimed

Mann Whitney Test for Cause Factors of the Scale

Variable	Gender	N	Mean	SD	Z-Value	P Value
Awareness	Male	466	3.961	0.6668	-0.799	0.424
	Female	230	4.044	0.5295		
Communicate	Male	466	4.15	0.5344	-0.866	0.387
	Female	230	4.101	0.5847		
Naming	Male	466	3.845	0.6385	-0.135	0.893
	Female	230	3.839	0.6497		
Confidence	Male	466	3.888	0.6144	-0.445	0.656
	Female	230	3.916	0.5867		
Participate	Male	466	4.075	0.6869	-0.176	0.078
	Female	230	4	0.6441		
Negotiate	Male	466	4.112	0.6955	-0.106	0.286
	Female	230	4.116	0.5297		
Benefit	Male	466	3.994	0.7273	0.657	0.511
	Female	230	4.048	0.7008		
Coercion	Male	466	3.983	0.7099	-0.565	0.572
	Female	230	4.024	0.6743		

there is no difference in opinion between different gender group (H1o is accepted).

Mann Whitney Test for Effect Factors :

In the above test table, effect variables such as R_Awareness, R_Communicate, R_Naming, R_Confidence, R_Partici-

pation, R_Negotiate, R_Benefit and R_Coercion have their p value greater than 0.05 hence test is statistically insignificant for all variables and can be claimed there is no difference in opinion between different gender group (H2o is accepted).

Variables	R_awarene	R_communication	R_naming	R_confidence	R_participation	R_negotiation	R_benefit	R_coercion
Z Value	-0.486	-0.805	-0.145	-0.314	-1.700	-1.280	-0.496	-1.195
P value	0.627	0.421	0.885	0.753	0.089	0.200	0.620	0.232

Kruskal-Wallis Statistical Test Analysis

Kruskal-Wallis Test is a technique used to determine the difference in means among more than two groups. While interpreting the results if p-value less than or equal to 0.05 ($P \leq 0.05$) then such variables are said as statistically significant, else statistically insignificant and possess no difference between groups (Elif. F. Acar & Lei Sun, 2012). In this research, Kruskal-Wallis Test was used to test the difference of means between age group, profession, locality, education and experience. Kruskal-Wallis test analysis was needed to be employed because the independent variable such as locality, age, education, experience and profession has more than two groups which were measured on a categorical scale and the dependent variable was measured on a continuous scale.

This test helps to understand whether different geography stakeholder has anything to do with their opinion on privatization adoption. In the accompanying Table, Kruskal-Wallis test table for cause variables such as awareness, communication, confidence, participation, benefit and coercion have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different geographical respondent.

However, for variables such as Naming and Negotiation have their p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in means between different categories. So it can conclude that there is an impact of age on change factors especially on Naming and Negotiation. Respondent of different age have different opinion on Naming and Negotiation of privatization policy (H3o Rejected).

Kruskal-Wallis Test – Locality – Cause Factors

Frequency	Urban = 404	Semi urban = 130	Rural = 162	Total = 696
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Kruskal-Wallis Test – Cause Factors of Change Management

	Awareness	Communication	Naming	Confidence	Participation	Negotiation	Benefit	Coercion
Chi-Square	1.161	1.757	6.147	3.069	2.898	13.131	1.351	1.088
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.560	.415	.046	.216	.235	.001	.509	.580

Kruskal-Wallis (kw) – Different Locality Vs Effect Factors

This test helps to understand whether different geography stay has anything to do with their opinion on change factors application on privatization adoption. Kruskal-Wallis test analysis was needed to be employed because the independent variable locality has three groups which were measured on a categorical scale and the dependent variable was measured on a continuous scale.

In the above Kruskal-Wallis test table for effect variables such as R_awareness,

R_Communication, R_Naming, R_Confidence, R_Participation, R_Negotiation, R_Benefit and R_Coercion have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different geographical respondents on effect factors (H₀ Accepted).

This test helps to understand whether different age groups have anything to do with their opinion on cause factors of change management for privatization adoption.

Kw Test Locality – Effect Factors of Change Management

	R_awareness	R_communicate	R_naming	R_confidence	R_participation	R_negotiation	R_benefit	R_coercion
Chi-Square	.543	2.349	1.021	3.630	2.893	.659	3.363	5.156
df	2	2	2	2	2	2	2	2
Asymp. Sig.	.762	.309	.600	.163	.235	.719	.186	.076

Kruskal-Wallis Test – Age Groups Vs Cause Factors of the Scale

Age	18-25 yrs =	26-35 yrs =	36- 50 yrs =	Above 50 yrs =	Total
Frequency	225	321	80	70	696

Kruskal-Wallis Test – Cause Factors of the Scale

	Awareness	Communication	Naming	Confidence	Participation	Negotiation	Benefit	Coercion
Chi-Square	1.190	3.079	19.423	2.060	5.274	3.886	2.730	5.996
df	3	3	3	3	3	3	3	3
Asymp. Sig.	.755	.380	.000	.560	.153	.274	.435	.112

In the above table, kruskal-wallis test table for cause variables such as Awareness, Communication, Confidence, Participation, Negotiation, Benefits and Coercion have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different age group respondent on cause factors of change management. However, for variables such as Naming has their p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in means between different categories of age group (H5o Rejected). Hence alternative hypothesis is accepted. So it can conclude that there is an impact of age on change factors especially on Naming. Respondent of different age have different opinion on Naming of privatization policy.

Kruskal-Wallis Test – Age – Effect Factors of the Scale

This test helps to understand whether different age groups have anything to

do with their opinion on privatization adoption due to change management application.

In the above Kruskal-Wallis test table for effect variables such as Communication, Confidence, Participation, Benefits and Coercion have their p more than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in means between different categories for above variables. However, R_Awareness, R_Naming and R_Negotiation have its p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in means between different categories (H6o Rejected). So it can be inferred that there is an impact of age on change factors especially on R_Awareness, R_Naming and R_Negotiation. Respondent of different age have different opinion on economic policy change factors.

This test helps to understand whether different education groups have anything to do with their opinion on privatization adoption.

Kruskal-Wallis Test – Effect Factors of the Scale

	R_awarene	R_communication	R_naming	R_confidence	R_participation	R_negotiation	R_benefit	R_coercion
Chi-Square	10.152	8.620	19.818	8.713	4.300	26.903	3.277	1.585
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.038	.071	.001	.069	.367	.000	.513	.812

Kruskal-Wallis Test – Education Vs Cause Variables of Scale

Frequency	PUC &ITI =	DIPLOMA =	SSLC =	< SSLC =	Graduate =	PG =	Total =
	27	187	49	32	215	186	696

Kruskal-Wallis Test – Cause Factors of The Scale

	Aware-ness	Communi-cation	Naming	Confi-dence	Partici-pation	Negotia-tion	Bene-fit	Coer-cion
Chi-Square	4.062	3.827	25.863	11.906	5.055	6.676	16.180	12.360
df	5	5	5	5	5	5	5	5
Asymp. Sig.	.541	.575	.000	.036	.409	.246	.006	.030

In the above Kruskal-Wallis test table for Cause variables such as Awareness, Communication, Participation, and Negotiation have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different categories of education respondent. However, Naming, Confidence, Benefit and Coercion variables has its p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in means between different categories (H₀ Rejected). So it can be conclude that there is an impact of Education on change factors especially on Naming, Confidence, Benefit and Coercion variable. Respondent of different education have different opinion on economic policy change factors.

Kruskal-Wallis Test – Education vs Effect Variables

This test helps to understand whether different education groups have anything to do with their opinion on privatization adoption due to change management application.

The accompanying Kruskal-Wallis test table for effect variables such as R_awareness and R_communication have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different categories of education respondent. However, R_Naming, R_Confidence, R_Participation, R_Negotiation, R_Benefit and R_Coercion variable has their p value less than 0.05 hence Kruskal-Wallis test is statistically significant and

Kruskal-Wallis Test – Education vs Effect Factors of Scale

	R_aware- rene	R_communi- cation	R_nam- ing	R_conf- dence	R_partici- pation	R_negoti- ation	R_bene- fit	R_coer- cion
Chi-Square	2.006	6.404	15.636	20.486	12.537	13.585	17.699	23.191
df	5	5	5	5	5	5	5	5
Asymp. Sig.	.848	.269	.008	.001	.028	.018	.003	.000

can be claimed that there is a difference in opinion between different categories of education respondent (H_{8_0} Rejected). So it can be concluding that there is an impact of Education on change factors especially on above variables. Respondent of different Education have different opinion on economic policy change factors.

This test helps to understand whether different experience groups have anything to do with their opinion on privatization adoption. The aforementioned table Kruskal-Wallis test table for Cause variables such as Awareness, Communication, Participation, Negotiation, Benefits and Coercion have their p value more than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in

opinion between different categories experience respondent.

However, Naming and Confidence variable has their p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in opinion between different categories of experience (H_{9_0} Rejected). So it can be conclude that there is an impact of experience on change factors. Respondent of different education have different opinion on economic policy change factors.

Kruskal-Wallis Test – Experience Group – Effect Variables

This test helps to understand whether different experience groups have anything to do with their opinion on privatization adoption due to application of change management.

Kruskal-Wallis Test – Experience Group – Cause Variables

Frequency	No Exp =	1-4 yrs Exp =	5-14 yrs Exp =	15-24 yrs Exp =	25-35 yrs Exp =	Total =
	238	145	185	47	81	696

	R_aware- rene	R_commu- nication	R_nam- ing	R_conf- dence	R_partici- pation	R_negoti- ation	R_bene- fit	R_coer- cion
Chi-Square	10.152	8.620	19.818	8.713	4.300	26.903	3.277	1.585
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.038	.071	.001	.069	.367	.000	.513	.812

In the above Kruskal-Wallis test table for effect variables such as R_Communication, R_Confidence, R_Participation, R_Benefit and R_Coercion have their p value greater than 0.05 hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different categories of experience respondent. However, R_Awareness, R_Naming & R_Negotiation variable has its p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in opinion between different categories of experience

respondent (H10₀ Rejected). Respondent of different experience have their different opinion on economic policy change factors.

This test helps to understand whether different profession groups have anything to do with their opinion on privatization adoption.

In the above Kruskal-Wallis test table for cause variables such as Awareness, Communication, Confidence, Participation, Negotiation, Benefit and Coercion have their p value more than 0.05. Hence Kruskal-Wallis test is statistically insignificant for above variables

Kruskal-Wallis Test – Profession Group – Cause Variables

Frequency	PSU Employees = 266	Private Employees = 144	Self Employed = 68	Student = 200	Home Maker = 18	Total = 696
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Kruskal-Wallis Test – Profession vs Cause Change Factors

	Aware- ness	Comm- nication	Naming	Conf- dence	Partici- pation	Negotia- tion	Bene- fit	Coer- cion
Chi-Square	1.843	3.270	26.450	2.655	9.415	2.442	2.709	.670
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.765	.514	.000	.617	.052	.655	.608	.955

and can be claimed that there is no difference in opinion between different categories Profession respondent. However, Naming variable has its p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in opinion between different categories of profession respondent (H11₀ Rejected).

Kruskal-Wallis Test – Profession Group – Effect Variables

This test helps to understand whether different profession groups have anything to do with their opinion on privatization adoption due to application of change management practices.

In the above Kruskal-Wallis test table for effect variables such as R_Awareness, R_Communication, R_Naming, R_Confidence, R_Participation, R_Benefit and R_Coercion have their p value more than 0.05. Hence Kruskal-Wallis test is statistically insignificant for above variables and can be claimed that there is no difference in opinion between different categories of

profession. However, R_Negotiation variable has their p value less than 0.05 hence Kruskal-Wallis test is statistically significant and can be claimed that there is a difference in means between different categories of profession. So it can conclude that there is an impact of profession on change factors. Respondent of different profession have different opinion on economic policy change factors (H12₀ Rejected).

It was very apparent from the above analysis that Naming component, Confidence, Participation, Benefits and Coercion of change management factors has a significant different opinion among different age group, locality, experience, education and profession group respondent.

It was very apparent from the above analysis that Awareness Factor, Naming, Confidence, Participation, Negotiation, Benefits and Coercion of change management factors has a significant different opinion among different age group, experience, education and profession group respondent.

Kruskal-Wallis Test – Effect Change Factors

	R_awarene	R_communication	R_naming	R_confidence	R_participation	R_negotiation	R_benefit	R_coercion
Chi-Square	5.503	7.131	9.115	3.805	5.245	27.658	8.618	.470
df	4	4	4	4	4	4	4	4
Asymp. Sig.	.239	.129	.058	.433	.263	.000	.071	.976

Summary of Kruskal-Wallis Test for Cause Components

Variables	Age - Group	Locality	Experience	Education	Profession
Awareness	H ₀	H_{0}	H_{0}	H_{0}	H_{0}
Communication	H ₀	H_{0}	H_{0}	H_{0}	H_{0}
Naming	H_{1}	H_{1}	H_{1}	H_{1}	H ₁
Confidence	H ₀	H ₀	H ₁	H ₁	H ₀
Participation	H ₀	H ₁	H ₀	H ₀	H ₀
Negotiation	H ₀	H_{0}	H_{0}	H_{0}	H_{0}
Benefits	H ₀	H ₀	H ₀	H ₁	H ₀
Coercion	H ₀	H ₀	H ₀	H ₁	H ₀

H₀ : Accept Null Hypothesis, Reject Alternative Hypothesis.

H₁ : Accept Alternative Hypothesis, Reject Null Hypothesis.

Summary of Kruskal-Wallis Test for Effect Components

Variables	Age - Group	Locality	Experience	Education	Profession
R_Awareness	H ₁	H ₀	H ₁	H ₀	H ₀
R_Communication	H ₀	H_{0}	H_{0}	H_{0}	H_{0}
R_Naming	H ₁	H ₀	H ₁	H ₁	H ₀
R_Confidence	H ₀	H ₀	H ₀	H ₁	H ₀
R_Participation	H ₀	H ₀	H ₀	H ₁	H ₀
R_Negotiation	H ₁	H ₀	H ₁	H ₁	H ₁
R_Benefits	H ₀	H ₀	H ₀	H ₁	H ₀
R_Coercion	H ₀	H ₀	H ₀	H ₁	H ₀

Conclusion

This appeal for research was based on the need of application of change management concepts to macro problems. It is to analyze and to calculate the consent for how stakeholders respond to change efforts. The Normality statistics

suggests a need of non-parametric statistical tests to evaluate data. Mann-Whitney test demonstrate that no significant difference in opinion among male and female opinion on change management factors during privatization efforts. Kruskal-Wallis test

demonstrate that no significant difference in opinion among different geographic respondent on change management factors except Naming and Negotiation while privatization efforts. Kruskal-Wallis test for different age group demonstrate that no significant difference in opinion among different age group on change management factors except Naming for cause change factors and Awareness, Naming and Negotiation of effect change factors while privatization efforts. Kruskal-Wallis test for different education respondent has shown significant difference in opinion on change management factors such as Naming, Confidence, Benefit and Coercion. It is obvious that the concepts such as naming and confidence are known among educated one than less educated. Similarly educated respondent expectation and accepting pressure tactics will differ. Significant difference found with naming among different experience and profession group. We believe that concept Naming is the technical thing hence difference in opinion is obvious.

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A Study on Operational Efficiency of Public Sector Banks in the Pre- and Post-Merger Periods

M.Jegadeeshwaran* & M.Basuvaraj**

The main objective of the study is to measure the operational efficiency of public sector banks in the pre and post merger periods. The study period covers five years the pre- and post-merger of banks. For the purpose of the study, the census method has been adopted to select public sector banks namely the State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. The latest mergers have been taken for sample size of the study i.e., after the year 2000 has been considered. The data analysis is done using ratio analysis, descriptive statistics like mean, standard deviation, coefficient of variation, compound annual growth rate and paired t test. The present study is concluded that there is significant difference in deposit per employee ratio and deposit per branch ratio of the public sector banks in the pre and post merger periods.

Keywords : Operational Efficiency, Public Sector Banks, Mergers, Ratio Analysis, Descriptive Statistics and Paired t-test.

Introduction

The terms “operational efficiency”, “efficiency” and “productivity” are often used interchangeably. An explanation to the difference between efficiency and (total factor) productivity is found in “An Introduction to Efficiency and Productivity Analysis”. To complicate, “operational excellence” which is about continuous improvement – not limited to efficiency is occasionally used when meaning operational efficiency. From time to time “operating excellence” is also used with the same meaning as “operational efficiency”. Mergers and Acquisitions as

a phenomenon are implemented to strengthen the banking system, embrace globalization, improve healthy competition, exploit economies of scale, adopt advanced technologies, raise efficiency and improve profitability.

The bank efficiency ratio is a quick and easy for measure a bank’s ability to turn resources into revenue. It is important to note that different business modules

* Dr.M.Jegadeeshwaran, Assistant Professor, School of Commerce, Bharathiar University, Coimbatore-646 046.

** M.Basuvaraj, Ph.D, Research Scholar, School of Commerce, Bharathiar University, Coimbatore-646 046.

can generate different bank efficiency ratios for banks with similar revenues. For instance, a heavy emphasis on customer services might lower a bank's efficiency ratio but improve its net profit. Banks that focus more on cost control will naturally have a higher efficiency ratio, but they may also have lower profit margins. In addition, the bank which generates in fees, the more it may concentrate on activities that carry high fixed costs. The degree to which a bank is able to leverage its fixed costs also affects its efficiency ratios that is, the more scalable a bank is, the more efficient it can become. For these reasons, comparison of efficiency ratios is generally most meaningful among banks within the same model, and the definition of a "high" or "low" ratio should be made within this context.

Statement of the Problem

The success of mergers lies in a lot of issues in terms of business, appraisal, risk integration etc, however, merger activities in the Indian banking sector have a marvelous effect on the bank performance. There are various reasons behind firms going for mergers and acquisitions. The merger deals are frequent not only in the developed countries but also have become more apparent in the developing countries. In the pre-liberalization period, in India, the incident recorded and upsurged in the wake

of liberalization measures resulting into shrinking the government controls, regulations and margins at which point the corporate houses got freedom to enlarge, spread and modernize the operations by resorting to mergers and take-over etc. With increasing competition and the economy direction towards globalization, mergers and acquisitions are estimated to come about at a much larger scale than any time in the earlier period and have played a very important role in achieving the competitive edge in the dynamic market environment. This raises the following question.

- How did the mergers of public sector banks perform in terms of operational efficiency in the pre- and post-merger periods?

Objective of the Study

- To measure the operational efficiency of public sector banks in the pre- and post-merger periods.

Hypotheses of the Study

- There is no significant difference in the operational efficiency of public sector banks between the pre- and post-merger periods.

Research Methodology

Sources of Data

The present study is mainly based on secondary data. The data for this study

is collected from the CMIE prowess database and also from selected banks annual reports, annual reports published by the Reserve Bank of India (RBI), money control website and Department of Banking Supervision

Period of the Study

The study period covers five years pre- and post-merger of banks. The year of merger as a base year and hence, it is excluded from the evaluation in order to have consistency in the evaluation of pre and post merger performance of acquirer banks. The year of merger differs in all merger deals.

Selection of the Sample

For the purpose of the study, the census method has been adopted to select public sector banks namely the State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, IDBI Bank and Oriental Bank of Commerce. Merger in India has assumed great significance with the advent of the policy of deregulation initiated in the year of 1991 and in the selection of sample the latest mergers have been taken for sample size of the study i.e. after the year 2000 have been considered.

Tools for Analysis

The data analysis is done using ratio analysis, descriptive statistics like mean,

standard deviation, coefficient of variation, compound annual growth rate and paired t test.

Operational Efficiency Ratios

The operational efficiency of public sector banks in the pre- and post-merger period has been measured with the help of following ratios.

- Deposit per Employee Ratio
- Advances per Employee Ratio
- Total Business per Employee Ratio
- Deposit per Branch Ratio
- Advances per Branch Ratio
- Total Business per Branch Ratio

Analysis of Operational Efficiency of State Bank of India in the Pre- and Post-Merger Periods

Table-1 shows the operational efficiency ratios of State Bank of India in the pre- and post-merger periods. In the pre-merger period the highest mean value of 79.77 was found in total business per branch ratio followed by deposit per branch ratio with the mean value of 47.43. The lowest mean value 1.82 found in the advances per employee ratio, among the elements, deposit per branch ratio was found to be consistent in the both pre-and post-merger periods. The compound annual growth rate highest in advances per employee

Table-1 : Operational Efficiency of State Bank of India

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	1.79	4.19	0.98	3.39	2.77	7.58	39.96	65.08	22	52.7	61.99	117.8
	1.91	4.84	1.32	4.03	3.23	8.87	40.14	70.03	27.6	58.2	67.77	128.3
	2.35	5.27	1.82	4.58	4.17	9.85	45.00	77.28	34.9	67.2	79.85	144.5
	3.00	6.28	2.33	5.45	5.32	11.73	50.30	83.18	39	72.2	82.39	155.4
	3.60	7.39	2.63	6.10	6.24	13.49	61.73	93.00	45.1	76.7	106.9	169.7
MEAN	2.53	5.59	1.82	4.71	4.35	10.30	47.43	77.71	33.73	65.40	79.77	143.11
SD	0.76	1.26	0.68	1.08	1.44	2.34	9.05	10.98	9.13	9.85	17.32	20.72
CV	30.20	22.51	37.67	23.02	33.14	22.69	19.08	14.13	27.06	15.07	21.72	14.48
CAGR	0.15	0.12	0.22	0.12	0.18	0.12	0.09	0.07	0.15	0.08	0.12	0.08

Source : Department of Banking Supervision and Money Control.

ratio 0.22 followed by total business per employee ratio 0.18, the lowest growth rate found in deposit per branch ratio. In the post-merger period, the highest mean value of 143.11 was found in total business per branch ratio with the mean value of 77.71. The lowest mean value in post merger period found in advances per employee ratio 4.71 in the post-merger period, the highest annual growth rate were found in deposit per employee ratio, advances per employee ratio and total business per employee ratio 0.12. The lowest annual growth rate was found in advances per branch ratio and total business per branch ratio.

Analysis of Operational Efficiency of Indian Overseas Bank in the Pre-and Post-Merger Periods

Table-2 examines the operational efficiency ratios of Indian Overseas Bank in the pre-and post-merger periods. In the pre-merger period the highest mean value of 38.09 was found in total business per branch ratio followed by deposit per branch ratio with the mean value of 26.26, the lowest mean value of 0.92 was found in advances per employee ratio, among the elements total business per branch ratio consistent in pre-merger period and the advances per

Chart-1 : Operational Efficiency of State Bank of India

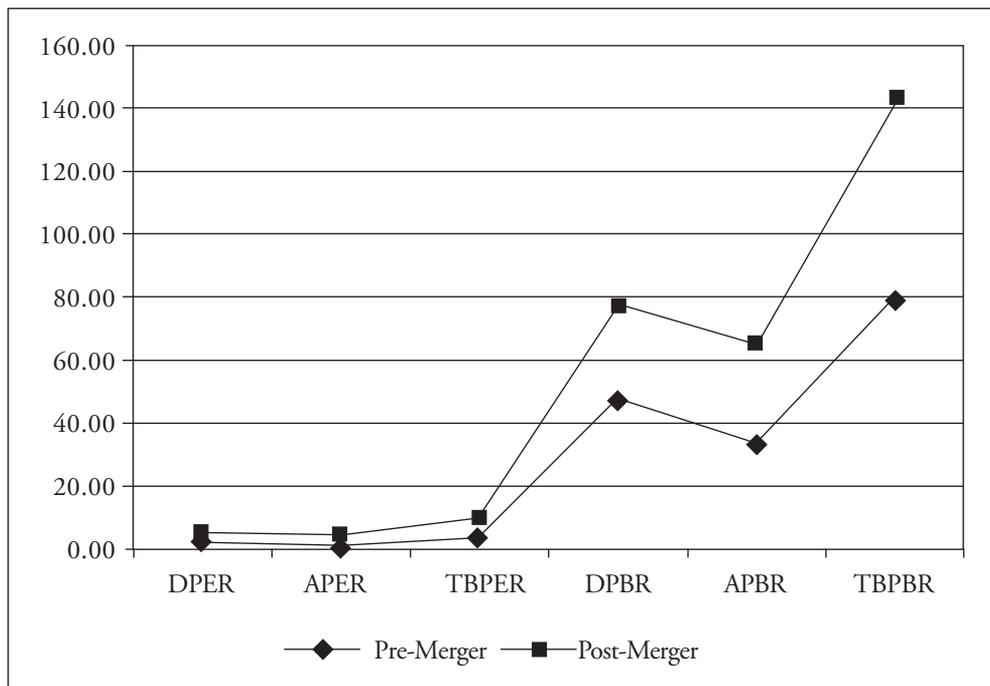


Table-2 : Operational Efficiency of Indian Overseas Bank

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	1.29	3.38	0.61	2.42	1.90	5.80	20.82	44.85	9.92	32.14	30.74	76.99
	1.50	3.92	0.71	2.94	2.21	6.68	24.27	51.95	11.54	38.86	35.81	90.82
	1.70	4.14	0.83	2.96	2.53	7.10	26.87	52.78	13.14	37.64	40.01	90.42
	1.82	5.67	1.03	4.36	2.85	10.03	27.95	63.67	15.92	37.64	43.87	112.70
	2.08	6.56	1.44	5.17	3.52	11.73	31.39	65.29	21.71	51.49	40.01	116.78
MEAN	1.68	4.73	0.92	3.57	2.60	8.27	26.26	55.71	14.45	39.55	38.09	97.54
SD	0.30	1.33	0.33	1.15	0.62	2.50	3.97	8.60	4.62	7.16	5.00	16.72
CV	17.99	28.06	35.51	32.17	23.97	30.28	15.12	15.44	32.02	18.11	13.13	17.14
CAGR	0.10	0.14	0.19	0.16	0.13	0.15	0.09	0.08	0.17	0.10	0.05	0.09

Source : Department of Banking Supervision and Money Control.

employee ratio was found inconsistent in pre merger period. The compound annual growth rate stands highest in 0.19 advances per employee ratio followed by advances per branch ratio 0.17, the lowest growth rate was found in total business per branch ratio. In the post merger period, the highest mean value of 97.54 was found in total business per branch ratio followed by deposit per branch ratio with the mean value of 55.71. The lowest mean value 3.57 was found in advances per employee ratio. In the post-merger period deposit per branch ratio was found to be consistency and the advances per employee ratio was found to be inconsistency. In the post-merger period, the highest annual growth rate was found in advances

per employee ratio 0.16 followed by total business per employee ratio 0.15, deposit per branch ratio was found in the lowest growth rate 0.08 in post-merger period.

Analysis of Operational Efficiency of Bank of Baroda in the Pre-and Post-Merger Periods

Table-3 shows the operational efficiency ratios of Bank of Baroda in the pre-and post-merger periods. In the pre-merger period the highest mean value of 20.50 was found in deposit per branch ratio followed by advances per branch ratio with the mean value of 10.81, the lowest mean value of 0.76 was found in advances per employee ratio, among the elements deposit per

Chart-2 : Operational Efficiency of Indian Overseas Bank

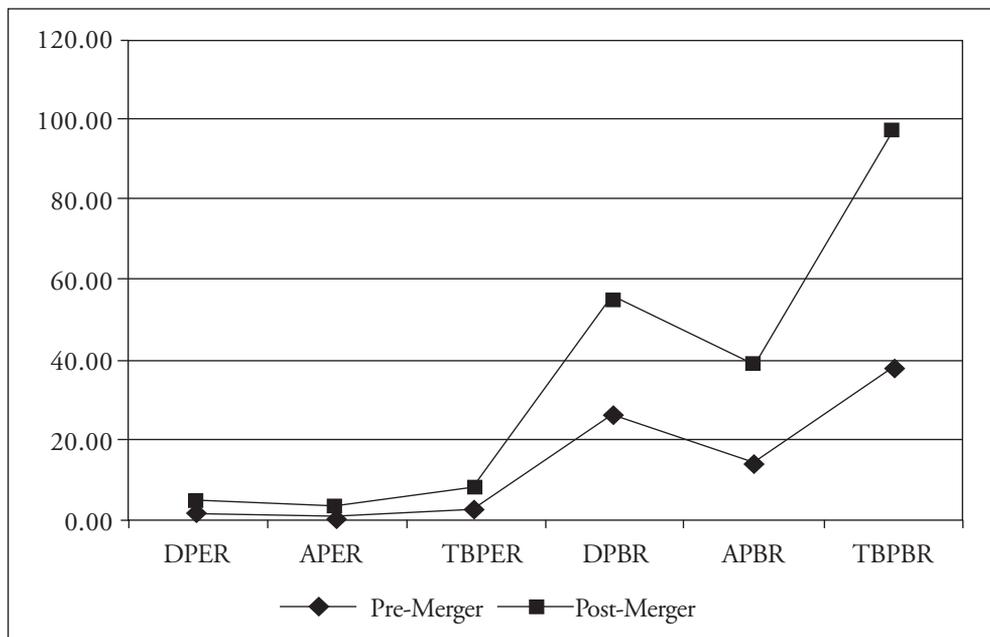


Table-3 : Operational Efficiency of Bank of Baroda

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	1.22	2.06	0.64	1.10	1.86	3.16	16.86	29.31	8.77	15.64	1.86	3.16
	1.39	2.42	0.66	1.55	2.05	3.96	19.12	33.73	9.09	21.57	2.05	3.96
	1.43	3.24	0.73	2.17	2.16	5.40	20.06	44.42	10.19	29.74	2.16	5.40
	1.59	4.08	0.87	2.86	2.45	6.94	22.74	53.44	13.39	37.50	2.45	6.94
	1.65	5.22	0.88	3.91	2.52	9.13	23.74	65.98	12.63	49.38	2.52	9.13
MEAN	1.46	3.40	0.76	2.32	2.21	5.72	20.50	45.38	10.81	30.77	2.21	5.72
SD	0.17	1.28	0.11	1.11	0.28	2.39	2.78	14.87	2.09	13.29	0.28	2.39
CV	11.71	37.61	15.04	47.86	12.49	41.82	13.55	32.77	19.33	43.19	12.49	41.82
CAGR	0.06	0.20	0.07	0.29	0.06	0.24	0.07	0.18	0.08	0.26	0.06	0.24

Source : Department of Banking Supervision and Money Control.

employee ratio consistency in the pre-merger period and the advance per branch ratio was found inconsistent in the pre-merger period. The compound annual growth rate highest in deposits per employee ratio 0.08, followed by deposits per branch ratio and advances per branch ratio 0.07, the lowest growth rate were found in deposit per employee ratio, total business per employee ratio and total business per branch ratio. In the post-merger period, the highest mean value of 45.38 was found in deposits per branch ratio, followed by advances per branch ratio with the mean value of 30.77. The lowest mean value 2.32 was found in advances per employee ratio. Deposit per branch ratio consistency in the post-merger

period and the advance per employee ratio was found to be in consistency. The highest annual growth rate was found in advances per employee ratio 0.29, followed by advances per branch ratio 0.26, deposits per branch ratio was found in the lowest growth rate 0.18 in the post-merger period.

Analysis of Operational Efficiency of Punjab National Bank in the Pre- and Post-Merger Periods

Table-4 examines the operational efficiency ratio of Punjab National Bank in the pre- and post-merger periods. In the pre-merger period, the highest mean value of 19.99 was found in total business per branch ratio followed by deposit

Chart-3 : Operational Efficiency of Bank of Baroda

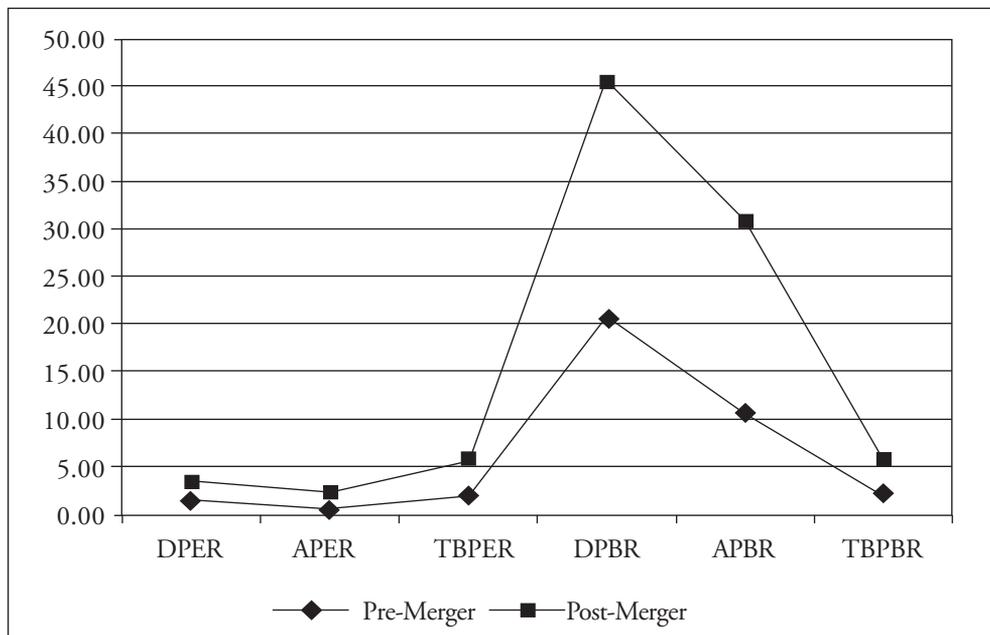


Table-4 : Operational Efficiency of Punjab National Bank

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	0.64	1.49	0.45	0.80	1.09	2.30	9.71	21.44	6.89	11.52	16.60	32.96
	0.72	1.75	0.50	1.03	1.21	2.78	10.77	24.99	7.52	14.63	18.29	39.63
	0.83	2.06	0.39	1.29	1.22	3.35	12.45	28.90	5.92	18.02	18.37	46.91
	0.97	2.44	0.49	1.69	1.46	4.13	14.42	33.56	7.20	23.18	21.62	56.73
	1.11	2.97	0.59	2.13	1.70	5.10	16.31	39.82	8.74	28.59	25.05	68.41
MEAN	0.85	2.14	0.48	1.39	1.34	3.53	12.73	29.74	7.25	19.19	19.99	48.93
SD	0.19	0.58	0.07	0.53	0.24	1.11	2.68	7.22	1.02	6.81	3.36	14.02
CV	22.16	27.22	15.15	38.21	18.25	31.44	21.04	24.27	14.12	35.47	16.83	28.65
CAGR	0.12	0.15	0.06	0.22	0.09	0.17	0.11	0.13	0.05	0.20	0.09	0.16

Source : Department of Banking Supervision and Money Control.

per branch ratio with the mean value of 12.73, the lowest mean value of 0.48 was found in advances per employee ratio, among the elements advances per branch ratio consistent in pre-merger period and the deposit per employee ratio was found in inconsistency in pre merger period. The compound annual growth rate highest in 0.12 deposits per employee ratio followed by deposit per branch ratio 0.11, the lowest growth rate was found in advances per branch ratio. In the post merger period, the highest mean value of 48.93 was found in total business per branch ratio followed by deposit with branch ratio with the mean value of 29.74. The lowest mean value 1.39 was found in advances per employee ratio. In the post-merger

period, the highest annual growth rate was found in advances per employee ratio 0.22 followed by advances per branch ratio 0.20, deposit per branch ratio was found in the lowest growth rate in post-merger period. Deposit per branch ratio found to be was consistency and an advance per employee ratio was found to be inconsistency in the post-merger period.

Analysis of Operational Efficiency of IDBI Bank in the Pre- and Post-Merger Periods

Table-5 reveals the operational efficiency ratios of IDBI Bank in the pre- and post-merger periods. In the pre-merger period, the highest mean value of 506.38 was found in total business per

Chart-4 : Operational Efficiency of Punjab National Bank

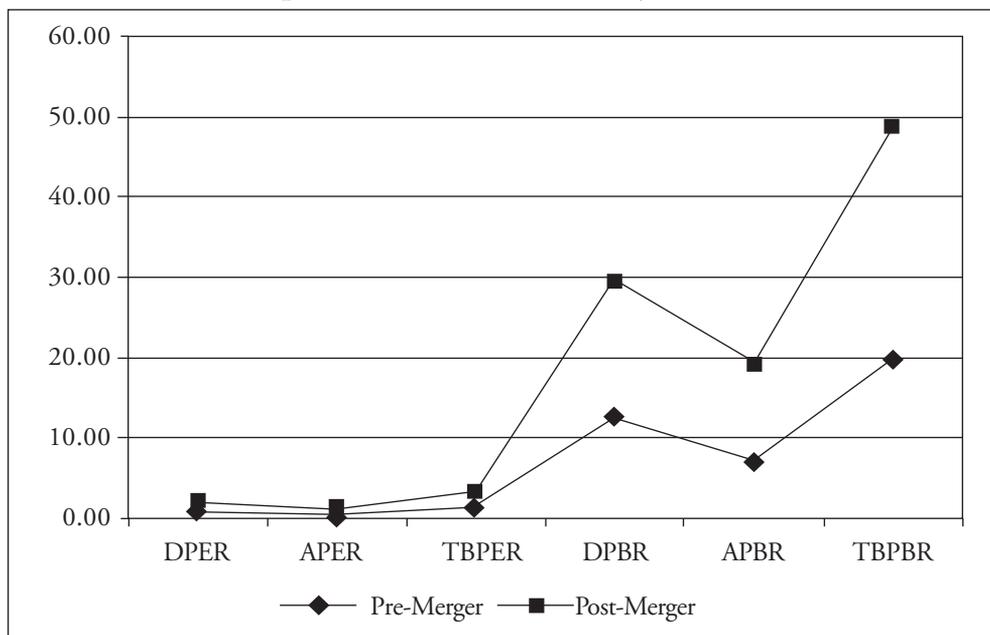


Table-5 : Operational Efficiency of IDBI Bank

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	1.37	5.79	27.54	8.35	28.91	14.14	22.75	98.09	457.32	141.34	480.07	239.42
	1.72	8.85	24.66	9.96	26.39	18.81	27.73	143.41	396.84	161.52	424.57	304.93
	21.93	11.02	22.06	10.14	43.99	21.16	344.24	216.16	346.16	198.90	690.40	415.06
	21.05	13.72	14.60	11.31	35.65	25.03	326.12	233.52	226.26	192.48	552.38	426.00
	6.14	13.47	18.47	11.73	24.61	25.19	96.20	221.15	289.26	192.52	385.46	413.67
MEAN	10.44	10.57	21.47	10.30	31.91	20.87	163.41	182.47	343.17	177.35	506.58	359.82
SD	10.26	3.33	5.09	1.32	7.95	4.63	159.60	58.91	90.13	24.85	120.40	83.43
CV	98.29	31.50	23.70	12.85	24.91	22.17	97.67	32.29	26.26	14.01	23.77	23.19
CAGR	0.35	0.18	-0.08	0.07	-0.03	0.12	0.33	0.18	-0.09	0.06	-0.04	0.12

Source : Department of Banking Supervision and Money Control.

branch ratio followed by advances per branch ratio with the mean value of 343.17, the lowest mean value of 10.44 was found in deposit per employee ratio, among the elements advances per employee ratio consistency in both pre merger period and the deposit per employee ratio was found in inconsistency in pre merger period. The compound annual growth rate highest in 0.35 deposits per employee ratio, followed by deposits per branch ratio 0.33, the lowest growth rate was found in advances per branch ratio. In the post-merger period, the highest mean value of 539.82 was found in total business per branch ratio, followed by deposit per branch ratio with the mean value of 182.42. The lowest mean value 10.30 was found in

advances per employee ratio. In the post-merger period deposit per branch ratio was found inconsistency. In the post-merger period, the highest annual growth rate were found in deposit per employee ratio and deposit per branch ratio 0.18, followed by total business per employee ratio and total business per branch ratio 0.12, advances per branch ratio was found in the lowest growth rate 0.06 in post-merger period.

Analysis of Operational Efficiency of Oriental Bank of Commerce in the Pre-and Post-Merger Periods

Table-6 deals with the operational efficiency ratios of Oriental Bank of Commerce in the pre- and post-merger

Chart-5 : Operational Efficiency of IDBI Bank

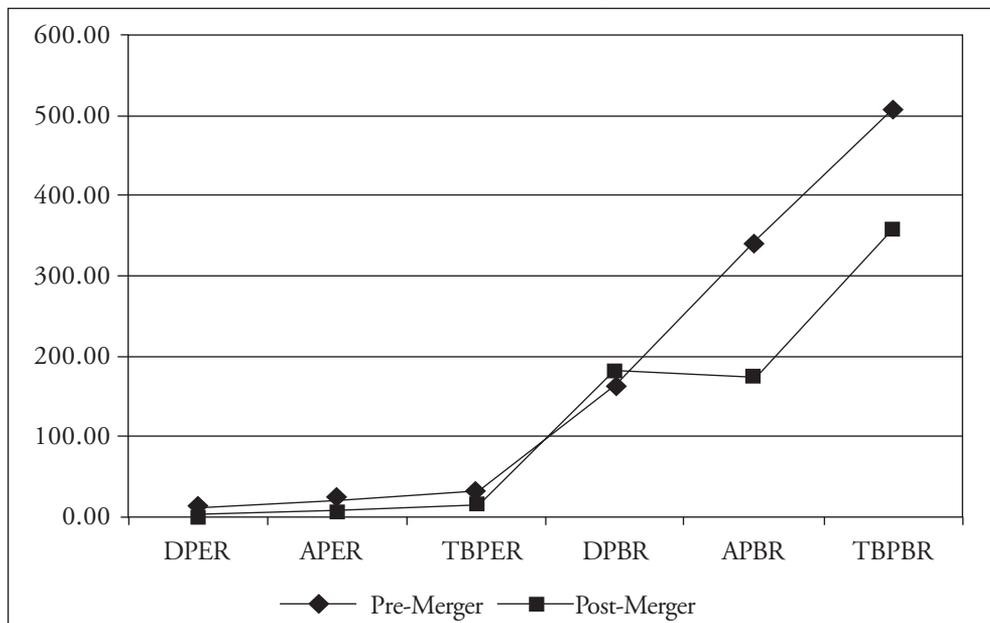


Table-6 : Operational Efficiency of Oriental Bank of Commerce

(₹ in Crore)

	DPER		APER		TBPER		DPBR		APBR		TBPBR	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post	Pre	Post
	1.25	3.29	0.67	1.74	1.92	5.03	17.22	40.97	9.20	21.66	26.42	62.63
	1.64	3.36	0.69	2.25	2.34	5.61	22.48	42.15	9.49	28.19	31.96	70.34
	1.83	4.34	0.82	3.00	2.65	7.34	24.78	47.97	11.12	33.09	35.90	81.06
	2.10	5.26	1.04	3.69	3.14	8.95	28.35	58.36	14.09	40.9	42.43	99.27
	2.21	6.71	1.16	4.67	3.37	11.39	29.00	68.22	15.25	47.5	44.25	115.72
MEAN	1.81	4.59	0.88	3.07	2.68	7.66	24.37	51.53	11.83	34.27	36.19	85.80
SD	0.38	1.43	0.22	1.16	0.59	2.59	4.80	11.59	2.72	10.20	7.37	21.65
CV	21.21	31.20	24.73	37.81	21.90	33.77	19.70	22.49	23.03	29.77	20.37	25.23
CAGR	0.12	0.15	0.12	0.22	0.12	0.18	0.11	0.11	0.11	0.17	0.11	0.13

Source : Department of Banking Supervision and Money Control.

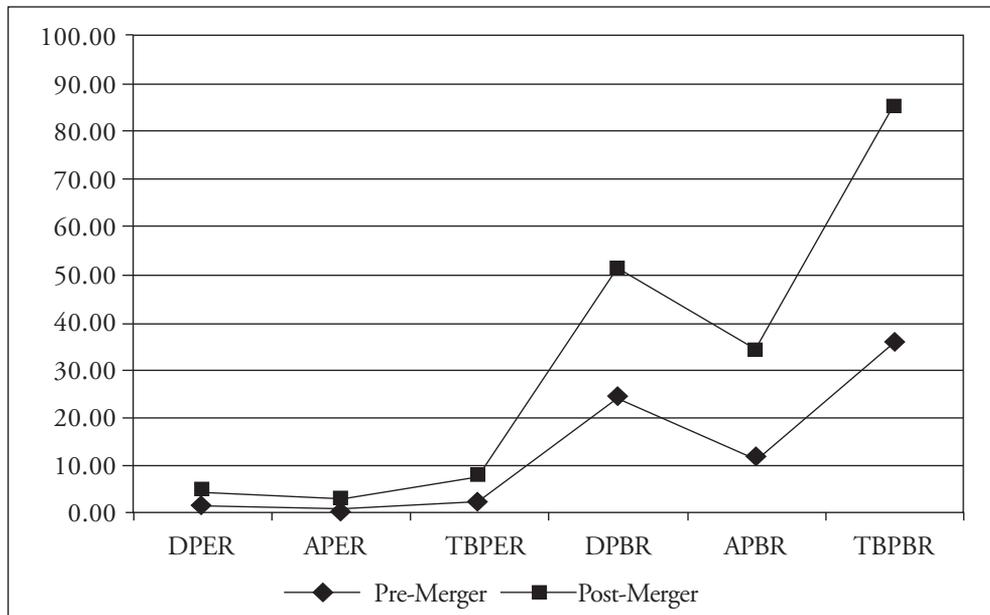
periods. In the pre-merger period, the highest mean value of 36.19 was found in total business per branch ratio followed by deposits per branch ratio with the mean value of 24.37, the lowest mean value of 0.88 was found in advances per employee ratio, among the elements deposits per branch ratio consistency in both pre merger periods, and the advances per employee ratio was found in inconsistency in pre and post merger periods. The highest 0.12 compound annual growth rate were found in deposits per employee ratio, advances per employee ratio and total business per employee ratio, followed by deposits per branch ratio, advances per branch ratio and total business per branch ratio 0.11. In the post-merger period, the

highest mean value of 85.80 was found in total business per branch ratio, followed by deposit per branch ratio with the mean value of 51.53. The lowest mean value of 3.07 was found in advances per employee ratio. In the post-merger period, the highest annual growth rate was found in advances per employee ratio 0.22, followed by total business per employee ratio 0.18, deposits per branch ratio was found in the lowest growth rate 0.11 in post-merger period.

Test for difference in Mean Ratio of Operational Efficiency of Select Public Sector Banks in India

Test for Difference in Deposit per Employee Ratio of Select Public Sector Banks in India

Chart-6 : Operational Efficiency of Oriental Bank of Commerce



Ho₂ : There is no significant difference in deposit per employee ratio of select public sector banks in the pre and post merger periods.

Table-7 shows the significant value of 0.008 at 5 per cent level of significance. Hence, the null hypothesis is rejected. Therefore, it was concluded that there is the significant changes in deposit per employee ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Industrial Development Bank of India and Oriental Bank of Commerce. From the above, it can be inferred that the mergers have fairly helped to maximize the deposit per employee.

Test for Difference in Advances per Employee Ratio of Select Public Sector Banks in India

Ho₂ : There is no significant difference in advances per employee ratio of select

public sector banks in the pre- and post-merger periods.

Table-8 reveals the significant value of 0.945 at 5 per cent level of significance. Hence, the null hypothesis is accepted. Therefore, it was concluded that there is no significant changes in advances per employee ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Industrial Development Bank of India and Oriental Bank of Commerce. From the accompanying Table, it can be inferred that the mergers have not helped to maximize the advances per employee.

Test for Difference in Total Business per Employee Ratio of Select Public Sector Banks in India

Ho₂ : There is no significant difference in total business per employee ratio of select public sector banks in the pre- and post-merger periods.

Table-7 : Deposit per Employee Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Merger – Post-Merger	-2.04167	1.16865	.47710	-3.26809	-.81525	-4.279	5	.008*

* indicates statistical significance at 5 per cent level.

Table-8 : Advances per Employee Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Merger – Post-Merger	.16167	5.44141	2.22144	-5.54874	5.87207	.073	5	.945

* indicates statistical significance at 5 per cent level.

Table-9 : Total Business per Employee Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Merger – Post-Merger	-1.87667	6.48411	2.64713	-8.68132	4.92799	-.709	5	.510

* indicates statistical significance at 5 per cent level.

Table-9 examines the significant value of 0.510 at 5 per cent level of significance. Hence, the null hypothesis is accepted. Therefore, it was concluded that there is no significant changes in total business per employee ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Industrial Development Bank of India and Oriental Bank of Commerce. The results from Table-9 points out that the mergers have not helped to maximize the in total business per employee.

Test for Difference in Deposit per Branch Ratio of Select Public Sector Banks in India

Ho₂ : There is no significant difference in deposit per branch ratio of select public sector banks in the pre- and post-merger periods.

Table-10 shows the significant value of 0.000 at 5 per cent level of significance. Hence, the null hypothesis is rejected. Therefore, it was concluded that there is the significant changes in deposit per

Table-10 : Deposit per Branch Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences						t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference					
				Lower	Upper				
Pair 1 Pre-Merger – Post-Merger	-24.64000	5.49012	2.24133	-30.40153	-18.87847	-10.993	5	.000*	

* indicates statistical significance at 5 per cent level.

branch ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Industrial Development Bank of India and Oriental Bank of Commerce. The numbers presented in Table-10 are largely self-explanatory that the mergers have moderately helped to maximize the deposit per branch.

Test for Difference in Advances per Branch Ratio of Select Public Sector Banks in India

Ho₂ : There is no significant difference in advances per branch ratio of select public sector banks in the pre and post merger periods

Table-11 reveals the significant value of 0.784 at 5 per cent level of significance. Hence, the null hypothesis is accepted. Therefore, it was concluded that there is no significant changes in advances per branch ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda,

Punjab National Bank, Industrial Development Bank of India and Oriental Bank of Commerce. It is clear from the above Table that the mergers have not helped to maximize the advances per branch.

Test for Difference in Total Business per Branch Ratio of Select Public Sector Banks in India

Ho₂ : There is no significant difference in total business per branch of select public sector banks in the pre and post merger periods.

Table-12 shows the significant value of 0.778 at 5 per cent level of significance. Hence, the null hypothesis is accepted. Therefore, it was concluded that there is no significant changes in total business per branch ratio of State Bank of India, Indian Overseas Bank, Bank of Baroda, Punjab National Bank, Industrial Development Bank of India and

Table-11 : Advances per Branch Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Merger – Post-Merger	9.11833	77.03886	31.45098	-71.72899	89.96565	.290	5	.784

* indicates statistical significance at 5 per cent level.

Table-12 : Total Business per Branch Ratio of Select Public Sector Banks

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pre-Merger – Post-Merger	-9.68167	79.79141	32.57471	-93.41761	74.05428	-.297	5	.778

* indicates statistical significance at 5 per cent level.

Oriental Bank of Commerce. It can be inferred that the mergers have not helped to maximize in the total business per branch.

Suggestions

The objectives of merger activities is a new competency and capacity, to remain competitive and grow prosperity based on which a few suggestions to the banks which are merged and have plan to merge in future.

- From the study, it is observed that the merger of select public sector banks in India has entailed a positive efficiency growth, at the same time IDBI Bank and Bank of Baroda has experienced a light change. So, the banks should concentrate to increase their operational efficiency.
- The banks should improve their advances per branch and deposits per branch ratios through optimum utilization of funds.

Conclusion

The banking industry has been undergoing major mergers in recent years with a number of global players emerging through successive mergers. The present study indicates that during the study period the operational efficiency of merger banks showed a healthy picture and an upward trend when compared to pre-mergers. The impacts of mergers were examined to establish the extent to which the benefits accrue as a viable factor in enhancing the bank performance. This study identified the areas of improvement of post-mergers in the area of deposit per employee ratio, advances per employee ratio, total business per employee ratio, deposit per branch ratio, advances per branch ratio, and total business per branch ratio of public sector banks in India.

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An Empirical Study on Employee Engagement and Attitudinal and Workgroup Commitment

Anuradha Chavali* & Nihar Ranjan Mishra**

Employee engagement and organization commitment has been doing rounds since a long time, but very little is known about its implications for educational institutions. Hence this study was undertaken to empirically substantiate the association between employee engagement and organizational commitment in educational institutions. This study used stratified random sampling technique with a sample of 150 teachers out of which only 142 were deemed fit for the study. Descriptive research design was adopted for analysis of relationship between dependent and independent variables. Chi-square tests were used for identifying association between the factors and data was processed using SPSS. This study highlights significant association between age group and teacher engagement whereas other personal characteristics such as gender, marital status and level of functioning bear no association with engagement. An attempt has been made to make a meaningful association between personal characteristics, employee engagement and commitment towards organization and workgroup. This study provides an insight into the empirical relationship between employee engagement and organizational commitment in educational institutions where attrition rate is high and where engagement and disengagement is hard to figure out.

Keywords : Engagement, Commitment, Workgroup Commitment.

Introduction

Employee engagement and organisational commitment : Though employee engagement and organisational commitment are often used interchangeably, both being inevitable areas where the organisation needs to invest lot of time, effort and money, still there are clear distinctions between engagement and commitment and we will start our discussion by understanding them as different entities and then by analyzing them together.

Employee engagement can be widely felt as and when the employee shows undisputed voluntary urge to achieve the desired results. According to Bevan et.al (1997), anyone who can bring about a fit between organisation and the external environment by promoting team

* Anuradha Chavali, Assistant Professor, Vignan Institute of Technology and Science, Deshmukhi, Pochampally(M), Yadadri-Bhuvanagiri District, Telangana.

** Dr.Nihar Ranjan Mishra, Head, Department of Business Administration, Berhampur University.

work directed towards realization of goals is known as engaged employee commitment. On the other hand is how one can relate themselves to the goals of the organisation and take pride to be a part of the organisation promoting loyalty towards the organisation. According to Mowday et. al (1982), a committed employee possesses inherent desire to be a part of the organisation and assimilation of the value system of the organisation.

Engagement : Though the word engagement has been doing rounds since a very long time; unfortunately there is an untold scarcity of research on employee engagement in academic institutions. Definitely, the buzz around engagement is not just hype. With reference to one of the most commonly cited engagement models, (Schaufeli et.al. 2002) engagement is a judicious mix of enthusiasm, internalization and commitment. Nevertheless, since engaged employees are psychologically and emotionally involved (Khan, 1990), they put the best of their efforts to the realization of their individual and organisational objectives (Schaufeli et.al., 2002).

With reference to Penna research report (2007) assimilation and identification with the organization has the tendency to bring all the colleagues together for

mutual benefit of the individual as well as the workplace with the organisation meeting its primary objective of profit-making and individuals experiencing a bliss of togetherness, purpose, freedom and participation that adds meaning to their efforts.

Research throws light on the fact that engagement is desirably related to ultimate end user satisfaction (Coffman, 2000; Ellis & Sorensen, 2007; Towers Perrin Talent Report, 2003; Hewitt Associates, 2004, Heintzman & Marson, 2005; Coffman & Gonzalez-Molina 2002).

Academicians, practitioners and researchers are directed towards understanding the nuances of engagement in various sectors but very little work has been done in the academic front where educational institutions are considered to be pattern maintenance organizations' that need dedicated and committed staff members who could instill knowledge and learning and leadership as well as values and ownership for a holistic development of the individual thereby paving path for a better society at large. Thus this study attempts to make up for the gross lacuna of research in this particular service sector and attempts to explore the relationship between employee engagement and organisational commitment.

Commitment

The most popularly used but very little understood term in literature (Allen & Meyer, 1990 p.14). Works in this direction does not present us with a time tested model (Coopey & Hartley, 1991).

The following study takes two approaches for conceptualization of commitment-one being attitudinal commitment which is by far the widely used and tested method of measuring the concept through an individual's attitude and emotions towards his work place (Legge, 1995). As is evident in the deliverables of Buchanan (1974) which is extended by Porter et.al. (1974) and Mowday et.al. (1982), attitudinal commitment is the subjective strength of an individual's internalization of the work culture and contribution to the organisational goals (Porter et.al., 1974, p.604) as is evident from the 3 s – Say, Stay and Strive. Amongst the most popular scales in this field is that of organisational commitment questionnaire developed by Porter et.al. in 1974. It uses 15 items rated on a seven point Linkert scale to measure identification, involvement and loyalty towards the organisation.

Study Hypothesis

H1 : There is no significant association between personal characteristics and employee engagement and commitment.

H2 : There is no significant association between employee engagement and organisational commitment.

H3 : There is no significant association between employee engagement and work group commitment.

Design

Participants : Sample size consisted of 150 teachers working in various educational institutions out of which only 142 were deemed fit for the study.

Procedure : Data was collected by administering a questionnaire to the teachers under question that had three parts one for the personal profile and the other two parts for assessing employee engagement and commitment measured from two dimensions-school commitment and workgroup commitment.

Discussion

This study shows that in the middle aged group between (27-34) engagement is high with a majority of 53 per cent falling in this category. The Pearson chi-square shows significant association between age and teacher engagement. (Chi-square 14.11, df=4, p<0.05).

The school commitment appears to be low in the age group 21-26 and moderate in the older age group. (Chi-square =16.72,df=4, p<0.05).

Results

Personal Characteristics, Engagement and Commitment (Hypothesis Results)

S.No.	Variables	Chi-square	Df	P=
1	Age Group vs. Teacher Engagement	14.11	4	<0.05
2	Age Group vs. School Commitment	16.72	4	<0.05
3	Age Group vs. Workgroup Commitment	7.47	4	<0.05
4	Gender vs. Teacher Engagement group	4.07	2	>0.05
5	Gender vs. School Commitment	4.38	2	>0.05
6	Gender vs. Workgroup Commitment	22.64	2	<0.05
7	Marital Status vs. Teacher Engagement group	3.69	2	>0.05
8	Marital Status vs. School Commitment	12.13	2	<0.05
9	Marital Status vs. Workgroup Commitment	3.54	2	>0.05
10	Level of functioning vs. Teacher Engagement	0.22	4	>0.05
11	Level of functioning vs. School Commitment	14.43	4	<0.05
12	Level of functioning vs. Workgroup Commitment	1.95	4	>0.05

Engagement and Commitment -Hypothesis Results

13	Teacher Engagement group vs. School Commitment	53.54	4	<0.05
14	Teacher Engagement group vs. Workgroup Commitment	20.51	4	<0.05

However, the Pearson chi square shows insignificant association between gender and engagement. (Chi square=4.07, df=2, p>0.05) whereas it shows a significant association between gender and workgroup commitment (Chi-square =22.64, df=2, P<0.05). In addition, the Pearson Chi-Square shows insignificant association between marital status and engagement (Chi-Square=3.69, df=2, P>0.05) whereas it shows a significant

association between marital status and commitment towards institution (Chi-square=12.13, df=2, P<0.05). As is evident from the Table, the Pearson Chi-Square shows an insignificant association between the level of functioning and engagement (Chi-Square=0.22, df=4, P>0.05)

From the study it is established that there is a significant association between

the age of the individual and their engagement towards their work. The engagement varies from low to moderate in young and older age group, the middle age group being more engaged in their job. Thus it indicates that the employer should have a right mix of employees of different age groups but preference can be given to seniority. It is well established that there is significant association between age and school commitment. This study reveals that commitment towards their institutions in majority of the employees in the age group between 21-26 is low, whereas it is moderate in the middle age group and is getting better in the old age groups. As the younger employees are low on their commitment towards school, they may not have the willingness to stay in the organisation for a long period of time. Thus the management should have effective retention programs that will facilitate the present workplace environment attractive to the faculty members.

It has been found that there is no significant association between gender and engagement and commitment towards school. Hence the employer should avoid gender biased decisions. It has been found that there is significant association between marital status and commitment towards school with married employees being more committed to the school as compared to

the unmarried. Hence there is a need for counseling of such faculty members to promote a sense of responsibility and belongingness towards their institution. The components that are essential for engagement were believed to be the creation of a conducive environment under the able leadership, with a freedom of choice and expression and opportunities for elevation of ones' innate potential for the growth and development of the individual in line with that of the organisation under the control mechanism of the organisation its authority and power equation and answerability obligation. The social needs that are one of the important needs of the individuals in the organisation play a predominant role in promoting a sense of affiliation towards their work and organization by promoting better interpersonal relationships in terms of complimentary transactions among the colleagues. To sum up, there is a significant association between school commitment, work group commitment and teacher engagement. As the organisation takes care of the employee's needs, it has a positive effect on the engagement of employees. Educational institutions should carefully tailor effective engagement programs that meet the intellectual, moral, developmental and social needs of the employees and implement them on a regular basis with proper monitoring and evaluation so as to improve employee engagement. Such programs success

depends on the commitment of the top management and facilitation of the middle and lower management in providing effective two-way communication and feedback system with regular on-the-job and off-the-job training programs and inculcating a distinct culture of belongingness to the organisation. While most of the work in this field considers only organisational commitment, this study evaluates the role of workgroup commitment, the result of which indicate that workgroup commitment is more prominent in a holistic rather than a individualistic context. In addition to it, the relationship between the parameters and locus of commitment were more dominant in a holistic context.

Implications

There is need for more extensive research on engagement of employees in educational institutions with focus on other dimensions of commitment like teaching commitment and occupational commitment as all of them are related to the psychological involvement of the faculty members. There is a need to understand the outcomes of engagement like satisfaction, motivation and job performance of faculty members. Though there are numerous models of engagement available, still some new models need to be developed and tested for being suitable to be used at educational setup to establish the

relationship of various parameters with teaching performance and employee turnover.

Limitations

Like any other study, the results of this study need to be understood *vis-a-vis* its limitations as the study used reported data. The results run a risk of being subjective as they are based upon the perceptions of the respondents. Other than lack of interest among some respondents in filling up the questionnaire, there are chances of biased information from the subjects in question.

Conclusion

Despite the fact that employee engagement has become a much discussed issue among practitioners and academicians and consultants, still there is a dearth of quantitative research in educational setup. Consequently there has been lot of disbelief among the target audience with regards to the importance of the same and its long term implications on educational institutions. The results of this study indicates that :

- There has been meaningful relationship between engagement and commitment with theoretical base.
- There is meaningful distinction between commitment towards the organisation and commitment towards workgroup.

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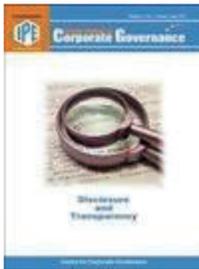
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S.No.	Title of Programme	Dates	Programme Director (s)
1	Valuation of Public Sector Enterprises	May 10-11, 2018	Dr A Pavan Kumar
2	Ethical Hacking, Cyber Security & Cyber Law	May 23-25, 2018	Mr A Rakesh Phanindra
3	Board Orientation Program for Directors	May 30-31, 2018	Prof R K Mishra & Ms J Kiranmai
4	Legal Aspects of People Management	June 21-22, 2018	Dr Deepti Chandra
5	Finance & Risk Management for Non-Finance Executives [for the executives of NMDC Ltd]	June 25-30, 2018	Mr S Satish Kumar & Dr K V Ramesh Kumar
6	Corporate Reforms and Changing Corporate Strategy	June 28-29, 2018	Dr K Trivikram & Dr Shaheen
7	Operations and Supply Chain Analytics for Competitive Advantage	July 2-4, 2018	Mr S Satish Kumar & Dr C V Sunil Kumar
8	Cyber Crime & Safety Measures	July 5-6, 2018	Mr A S Kalyana Kumar
9	Managing Corporate Social Responsibility for High Impact	July 19-20, 2018	Dr Shulagna Sarmar & Ms Pragnya Acharya
10	Ethical Hacking and Cyber Security	Aug 22-24, 2018	Mr A Rakesh Phanindra
11	Enhancing Effectiveness at Workplace	Sept 5-6, 2018	Dr A Sridhar Raj
12	Advanced Leadership Programme	Sept 10-23, 2018	Prof R K Mishra & Mr S Satish Kumar
13	Business Decision Making Using Software Tools (MS Excel, R & Tableau)	Sept 18-20, 2018	Dr Shaheen & Dr C V Sunil Kumar
14	Board Orientation Programme for Directors	Sept 24-25, 2018	Prof R K Mishra & Ms J Kiranmai
15	Rudiments of Business Analytics for Modern-day Decision Making – A Software Based Approach	Sept 25-26, 2018	Dr K V Anantha Kumar
16	Legal and Regulatory Issues in Power Sector	Sept 25-26, 2018	Dr Rajesh G
17	Advanced Leadership Programme for Women Executives	Oct 3-4, 2018	Dr Narendranath Menon, Dr P S Janaki Krishna & Dr P Geeta

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18	Cyber Attacks & Network Security	Oct 11-12, 2018	Mr A S Kalyana Kumar
19	Enhancing Accountability and Responsiveness in Scientific Organizations [DST Prog]	Oct 15-19, 2018	Dr P Geeta & Dr A Sridhar Raj
20	Strategic Marketing for PSUs	Oct 24-25, 2018	Dr M MKaruna & Dr M L N Rao
21	International Conference on “Operations and Supply Chain Excellence”	Oct 24-25, 2018	Mr S Satish Kumar, Mr S N Mantha & Dr C V Sunil Kumar
22	Financial Models for Sustainable Excellence	Oct 29-30, 2018	Mr M Chandrashekar
23	Project Management for Competitive Advantage	Nov 1-3, 2018	Mr S Satish Kumar & Mr S N Mantha
24	Goods And Services Tax (GST)	Nov 2-3, 2018	Dr K V Ramesh
25	Management of Technology & Innovation	Nov 5-9, 2018	Dr P S Janaki Krishna
26	Creativity & Problem Solving	Nov 5-6, 2018	Dr Anand Akundy & Dr N G Satish
27	SIPPA Programme	Nov 10-1 Dec, 2018	SIPPA Team & Dr Ch Lakshmi Kumari
28	International Conference on “Expanding HR Value : Unraveling the Future of Work”	Nov 15-16, 2018	Dr Shulagna Sarkar & Dr Samarendra Mohanty
29	GST -Policies, Perspectives and Practices (An Industry-oriented Programme)	Nov 15-16, 2018	Dr K Trivikram, Dr Usha Nori & Dr Sandeep Kumar
30	e-Procurement System for Vigilant and Transparency	Nov 19-20, 2018	Mr A S Kalyana Kumar
31	Enhancing Sales Performance	Nov 26-27, 2018	Dr V Srikanth & Mr P Mahesh
32	Understanding Foreign Currencies Risk and Global Finance	Nov 29-30, 2018	Dr Rajesh G & Dr M Karthik
33	Ethical Hacking and Cyber Security	Dec 3-5, 2018	Mr A RakeshPhanindra
34	Leadership and Change Management	Dec 6-7, 2018	Mr V AnjiRaju
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36	Effective Logistics & Supply Chain Management for Operational Excellence	Dec 17-19, 2018	Mr S Satish Kumar & Mr C V Sunil Kumar

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S.No.	Title of Programme	Dates	Programme Director (s)
37	6th National Conference on “Diversity in Management – Development of Women Executives”	Dec 20-21, 2018	Dr Narendranath Menon, Dr Anupama Dubey & Dr Prarthana Kumar
38	Enterprise Risk Management	Dec 27-29, 2018	Mr S Satish Kumar
39	Essentials of Corporate Finance	Dec 27-28, 2018	Dr A Pawan Kumar & Dr Harishankar Vidyarti
40	International Conference on “New Trade Policies and Capital Flows in the Context of Emerging Economies Under Deglobalization”	Dec 30-31, 2018	Dr Usha Nori & Dr Sandeep Kumar Kujur
41	Sustainable Lean Management Practices for Improved Business Performance	Jan 3-5, 2019	Mr S Satish Kumar & Mr C V Sunil Kumar
42	Emotional Intelligence for Improved Performance	Jan 9-10, 2019	Dr A Sridhar Raj
43	International Conference on Sustainable Development Goals	Jan 11-12, 2019	Dr P S Janaki Krishna & Dr Ch Lakshmi Kumari
44	Digital Marketing	Jan 17-18, 2019	Dr V Srikanth & Dr Prarthana Kumar
45	Strategic Management in PSUs for Success	Jan 23-24, 2019	Dr MLN Rao, Mr S N Mantha & Dr Santosh Kumar Tiwari
46	Risk Management in Banking & Other Lending Institutions	Jan 28-29, 2019	Dr Jyoti Kumari & Dr Shweta Mehrotra
47	6th International Conference on “Corporate Social Responsibility”	Feb 4-5, 2019	Dr Shulagna Sarkar
48	Communication for Managerial Effectiveness	Feb 6-8, 20-19	Dr Anand Akundy & Dr N G Satish
49	National Conference on “Data Science, Machine Learning, AI, IoT and Analytics”	Feb 7-8, 2019	Dr Shaheen
50	2nd National Conference on “Marketing in Digital India : Trends, Opportunities & Challenges”	Feb 18-19, 2019	Mr M J Ramakrishna & Mr A Rakesh Phanindra
51	10th International Conference on Corporate Governance : Governance & Integrity	Feb 21-22, 2019	Ms J Kiranmai, Ms Swetha Mahrotra & Accounting Research Institute, UTiM
52	National Conference on “Cyber Security”	Mar 6-7, 2019	Mr A S Kalyana Kumar & Mr A Rakesh Phanindra

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