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aims at bringing out the intricacies of Management perspectives, concepts,
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Shri Mahavira Jaina Vidyalaya (SMJV or Vidyalaya) has been serving Indian society for 104 years. Established in 1914 with the blessings of eminent Jain Guru YUGDRASHTA ACHARYA SHRI VIJAY VALLABHSURISWARJI MAHARAJ SAHEB, the roots of this premier institution are found in its belief that the education, coupled with followings of basic Jain principles will help the cause of Jain philosophy to create a non – violent, peaceful and prosperous society. In course of its existence of over a century, the SMJV has over 20,000 Alumni spread across the world, most of them well established and leading in their respective fields in India and globally.

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Currently the SMJV Trust is making great strides under the leadership of Shri Sudhirbhai Mehta, Chairman, Torrent Group, one of the most reputed and diversified industry House in Gujarat, ably supported by eminent Board of Trustees, able Executive Council members and some 900 dedicated SMJV Alumni and members. (Visit www.smjv.org)



From the Mind of Editor-in-Chief...

The Future of Accreditation of Universities and HNIs



Accreditation is the latest buzz word amongst the Universities and Higher Education Institutions (HNIs) and business managers, who believe in Quality Education to Students through Quality Teachers.

In India, only Government promoted Accreditation bodies can accredit Higher Education Institutions (HNIs): National Assessment & Accreditation Council (NAAC) for Universities and Colleges, and National Board for Accreditation (NBA) for Technical as well as Management Institutions (Business Schools). Medical, Healthcare and other specialized Sciences have their own Accreditation Councils. These are called 'Independent' Accreditation Councils; but fully managed by Government university professors and bureaucrats. India's 80% Private sector educational institutions have no role to play in accreditation governance and management, however brilliant professors they possess.

Dr. A. K. Sengupta and myself have just come out with an edited **Book** titled, "**Indian Higher Education: Quality and Global Accreditation**", published by **Himalaya Publications** for **Higher Education Forum (HEF)**. It contains 14 research articles by eminent academicians and industry honchos, and edited by a scholarly team of professors and experts at CKSVIM. One of the articles in the book by me and my team compares various national and international accreditation bodies and the services rendered by them. Don't miss to read this book!

The USA, UK, Europe and Australia have emerged as the leaders in Accreditation of Universities and HNIs. India, China, Vietnam, Bangladesh and other nations in Asia and Africa are evolving and debating over the policies, practices, opportunities and Governance of Accreditation system.

Most current Accreditation systems in the world are based on '**Outcome**' based **Accreditation**, meaning the entire process is directed to define the learning outcome of students and scholarly outcomes of teachers or faculties.

According to the **Council for Higher Education Accreditation (CHEA)**, **Department of Education, USA**, which is an apex body to coordinate and govern the Accreditation Councils in **America**, there are three types of accreditation Councils: **Regional, Programmatic, and Faith-based**, with their respective domains and mandates. **CHEA** has **85 councils** as member organizations, making it the largest accreditation system in the world. The **American system recognizes Government as well as Non-Government Accreditation Councils**, something which **India's Prime Minister's Office (PMO)** and **NITI Ayog** are discussing with other regulators and accreditation councils like **UGC, AICTE, NAAC, NBA** etc.

If India wants to progress rapidly in meeting with the challenges of quality education through accreditation of its fast expanding higher education system with over 850 universities and 40,000 colleges, it has no choice but to **invite and encourage at least 50 (Fifty) Government and Non-Government organizations to develop and offer 'Alternative Accreditation Paths'** to reach the simple target to accredit at least **50% of its potential 60,000 HNIs** by the **Year 2040**, I believe sincerely. 'Currently about 15% of India's HNIs are accredited since the country's independence in Year 1947.

However, the latest debate in the higher education world is, whether Accreditation should be 'Competency-based', and why not?

This is because, competency as a measurement of skills and workability of students (and faculties) is far more demanded by today's employers, corporate or business world. '**Outcome**' defines learning and knowledge level of students, while '**Competency**' defines working skills or '**output**' with applied knowledge.

Let me stop here to thank the scholarly authors of great research papers published in this edition of SANKALPA, Vol. 8, Issue 2, July – December 2018.

May God Bless you with rain showers of right knowledge and productive work...

Dr. Rajesh Khajuria
Director, CKSVIM
Commissioner, ACBSP, USA
Chair, Higher Education Forum - Gujarat

श्रद्धावाँल्लभते ज्ञानं तत्परः संयतेन्द्रियः । ज्ञानं लब्धा परां शान्तिमचिरेणाधिगच्छति ॥

“One who has faith and who with controlled senses is devoted to
attaining this wisdom is successful in his/her endeavour.
With wisdom and knowledge, he/she quickly attains the supreme peace.”
- Bhagvad Gita

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APPEAL TO THE AUTHORS AND CONTRIBUTORS

The present issue (Volume 8, Issue 2) is the July-Dec 2018 Issue, which contains research papers / articles in various areas of Management and Research. The bi-annual Journal 'SANKALPA' portrays our strong conviction to disseminate the thinking of academicians and practitioners in the field of Business Management discipline, which they communicate through their 'Reporting' in the form of research papers, articles, study reports, case studies, original conceptualizations with logical vigor and vision.

The members of the Editorial Board appeal to all the academicians and practitioners to communicate their 'Reporting' to the Editor-in-Chief for publication in our subsequent issues, through the e-mail ID : publications@cksvim.edu.in

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Spreading the Fragrance of Quality Education Worldwide...

Dr. Rajesh Khajuria, Director of **SMJV's CKSVIM** attended **Accreditation Council for Business Schools and Programs (ACBSP), USA's 30th Annual Conference** during June 7 to 11, 2018 at Kansas City, Missouri State, **USA**. The conference was attended by about 800 Professors, Dean, Provosts, Presidents / Chancellors from 30 countries with great speakers over 70 sessions.

ACBSP, approved by **CHEA**, Department of Education, Government of **The United States of America**, is the largest Accreditation Council for Business Schools & Programs in the world with about 1200 Member Campuses with 13,000 faculties from 60 countries.

Dr. Khajuria was elected to the highest honorary position of the **Commissioner on the Board of Commissioners of Accreditation Council for Business Schools and Programs, USA**. The Board grants final Accreditation / Re-accreditation to 1200 Member Business Schools and Universities in 60 countries.

Dr. Rajesh Khajuria is the first Indian to hold several honorary positions as the Commissioner on Board (2018-2021), Chair (Region 10 – South Asia Council 2017-2018), Mentor & Evaluator, as well as Member of 4 ACBSP Global Committees on Scholar Practitioner Publisher, Risk Assessment, Business & Industry Relations and Member Relations.

On invitations, **Dr. Khajuria** represented **SMJV's CKSVIM** while visiting **Marywood University, Scranton, Pennsylvania State, USA (MOU signed)**, **National Economics University, FPT University and SaigonTech, Vietnam (as ACBSP Mentor)**, **United International University and Independent University of Bangladesh, Dhaka**, and **AICTE Chairman, New Delhi** during the year 2017-2018, spreading the fragrance of quality education for improving students and faculty career.

Gratitude for the support of all the stakeholders: **SMJV Trust, CKSVIM, faculty, staff, students, society and Governments of India, USA and other nations**.



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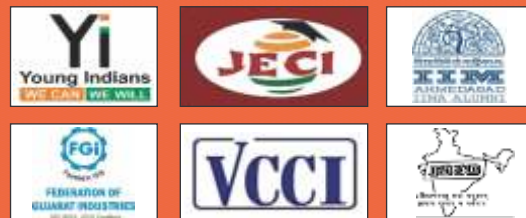


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Inspiring Quotes on Learning and Research....

'Take up one idea. Make that one idea your life. Think of it...Dream of it...Live on that idea. Let the brain, muscles, nerves, every part of your body, be full of that idea. And just leave every other idea alone. This is the way to success!'

- Swami Vivekananda

'Live as is you were to die tomorrow. Learn as if you were to live forever.'

- Mahatma Gandhi

'Imagination is the highest form of research.'

- Albert Einstein

'No research without action, no action without research.'

- Kurt Lewin

'Develop a passion for learning. If you do, you will never cease to grow.'

- Anthony J D'Angelo

'Research is to see what everybody else has seen, and to think what nobody else has thought.'

- Albert Szent Gyorgyi



Financial Knowledge and Financial Behaviour of Agri-Allied Entrepreneurs : A Mediatlional Study of Cultural Values

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Abstract

The development of agriculture continues to remain critical for India's employment, poverty reduction and overall economic growth. Therefore, the provision of credit finance among the stakeholders particularly to agri-entrepreneurs is assumed as one of the pressing tool for boosting the agriculture. Financial knowledge and cultural values are inevitable aspects of the sustainability especially in the economic analysis of sustainable development. It is argued that lack of these factors deprives the sustainability discourse in policymaking which led to scheme failure and suicides as evident in agricultural financing of farmers. In this backdrop the study is having its contribution in enhancing the effectiveness of credit financing schemes and acting as a hedge against the possible negative outcomes. Hence this research is an attempt to study the relationship that exists between financial knowledge, cultural values and financial behaviour in view of recent entrepreneurial financing schemes through (EDI) Entrepreneurial Development Institute Kashmir. As these schemes were introduced recently in Jammu & Kashmir but little emphasis was put on the information regarding management of finances hence the increased default rates in loan repayments with the result most targeted unemployed youth have no plans for these loans. Therefore, data was collected through a structured questionnaire from 200 respondents (who have availed the scheme) through random sampling technique. Further analysis of collected data was performed through statistical software's like SPSS and Amos using (SEM) Structural Equational Modeling. The findings reveal financial literacy among respondents led to low financial behaviour which is further reinforced by cultural values. Furthermore it was identified that Financial Knowledge is having significant positive impact on Financial Behavior and Cultural Values partially mediates the impact.

Key words : Financial Knowledge, Cultural Values, Financial Behaviour, Entrepreneurial Financing, (EDI) Entrepreneurial Development Institute.

Introduction

Agriculture continues to be the key industry and also forms the basis for a way of life for about two thirds of world's households. As estimated 75% of resource-poor people in developing countries rely on agro-based economic activities for their livelihoods.. Among all developing countries India's economic security is heavily dependent on agriculture. The role of agriculture in India's economic development is based on its contributions in Product, Income, Employment, Factor, Capital, Trade, Demand and Product. For this financing institutional agencies have to play a meaningful role here to take the Indian economy to higher levels of development as credit is the most crucial ingredient in the agri employment and production cycle.

However the efficiency and use of agri allied financing depends on the use by target consumers. A consumer is one of the basic agents in financial theory and understanding their financial behavior is vital to the modeling of consumer behavior attracting attention in scholarly world. Consumer financial behavior depicts the way in which consumers behave when faced with financial decisions to make. Extensive literature has revealed that financial knowledge and cultural values impact on individual financial behavior. Bell & Lerman (2005) stated that individuals with financial knowledge make better decisions than those without such knowledge. The education level influences consumer literacy which limits one's skills in the management of personal financial affair and fails to match income against expenditures (Mukasa & Masiga, 2003). Although the Government of India SEBI and RBI introduced financial literacy both programs aiming at improving on the literacy levels, the kind of education provided does not involve lessons on personal financial management (Oluka, 2004) leading to poor management of finances. Recently Govt. of India through Entrepreneurship Development Institute Kashmir started the scheme of credit financing for entrepreneurship Development but little emphasis was put in the management of finances hence the increased default rates in loan repayments as most individuals have no plans for these loans. Galiwango (2003) stated that many individuals do not understand

financial terms and they believe that finance is money hence lacks the culture of saving and their perceived social pressure to perform or not to perform the behaviour significantly changes. Cultural values as predictor of attitudes towards financial behaviour refers to the extent an individual value his/her interest in financial management, how society deals with uncertainty in the future and the degree of tolerance of social inequality by individuals within a social system. Financial behaviour (self control) refers to one's ability to control finances, budgeting and saving.

Statement of the problem

With limited income in Kashmir and low savings consumers are faced with a challenge of managing personal finances. Even when incentives to save and invest are strong, many people lack the basic knowledge to manage personal finances wisely; are unable to plan for their spending and many simply have no insight into the basic survival principles of earning, spending, saving and investing. As a result consumers in general and creditors in particular have continued to leave in vicious circles of borrowing

and lending due to lack of financial knowledge to meet their day to day financial obligations. It was therefore of interest to make an assessment on the extent to which financial knowledge, cultural values, attitudes, and subjective norms influence the financial behaviour with specific reference to EDI beneficiaries.

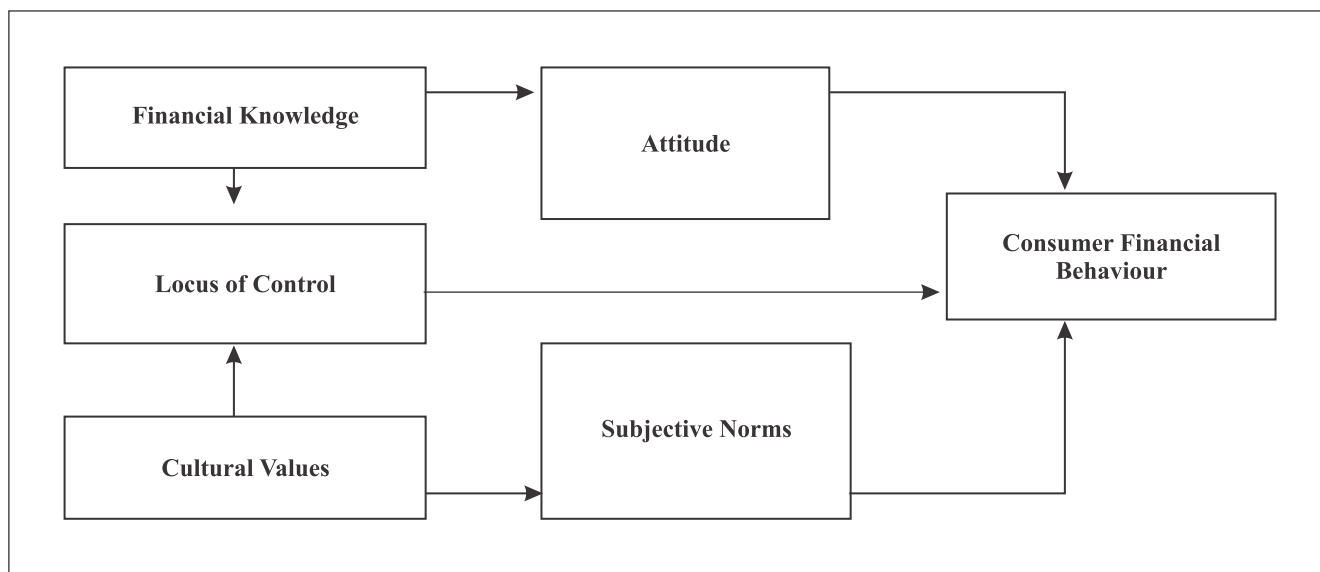
Objectives of the Study

- 1.To evaluate the impact of Financial Knowledge on Financial Behaviour.
- 2.To evaluate the mediating role of cultural values between Financial Knowledge and Financial Behaviour.

The Conceptual Framework.

The conceptual framework for this study is based on Ajzen's model (1991). Figure 1 below illustrates the relationship between Financial Knowledge, Cultural Values and Financial Behaviour, Financial Knowledge, Attitudes and Financial Behaviour is a function of Knowledge and Cultural Values. The presence of the Financial Knowledge and Cultural Values may lead to Attitudes and Subjective Norms, which affect the Financial Behaviour.

Figure 1: Conceptual Framework



(Source: Adapted from Ajzen and Fishbein, (2002), *The theory of planned behavior. Understanding and predicting Social Behavior*)

Literature Review

According to Vanessa & Marlene (2005), a consumers propensity to save, budget and control spending depends partly on their level of knowledge, perceived control outcomes, knowledge and financial resources. Chang & Hanna (1995) also argue that lack of financial knowledge is due to the fact that many sources of financial information are complex and inaccessible to the average consumer. Taylor & Overbey (1999) all conclude that lack of information and poor financial information contribute to consumer financial behaviour.

Cultural Values and Financial behaviour

The term culture as defined by Robinson (1985) refers to a dynamic system of symbols and meanings that involves an ongoing, dialectic process where past experience influences meanings, which in turn affects future experiences, which in turn affects subsequent meaning, and so on. Munene *et al.* (2005) also defines culture as a set of distinctive, spiritual, material, intellectual and emotional features that characterise a society or a social group. Although cultural values are an important issue in consumer behaviour, it has received relatively little attention in the United Kingdom (Dawn, 1996). Researching the relationship between cultural values and financial behaviour is a complex undertaking because of the uncertainty about how cultural values should be defined.

Chang (1998) examined the correlation between subjective norms and attitudes towards behaviour and in his study the path from subjective norms to attitudes towards behaviour was significant. According to Davidson and Burke, 2002 women and ethnic minority groups report organizational barriers to career advancement, one of these being discrimination and bias. Bell and komo, 2002 also suggest that according to some North American writing, the most disadvantaged may be women members of racial minority groups. Positively culture is a fundamental aspect of past experience. Different cultural value orientations underlie and rationalize the two mechanisms of social capital (Munene *et al.*, 2005). Cultural embeddedness can serve as the grounding for bonding expressed in close attachment to other members of one's community. In societies whose culture emphasises embeddedness values e.g. forgiving, security, social order, reciprocation of favours, solidarity with others in the community, trust and tolerance in group members are normal states of affairs. It is crucial for people in going smoothly and to maintain stable relationships within their group.

According to Schwartz (1997) the prevailing cultural ambience in much of Sub Saharan Africa during the last century still prevails today. Munene *et al.* (2005) states that when societies become more complex and extended kinship ties lose their central role in bonding societal members together, cultural embeddedness can no longer provide grounds for the bonding mechanisms that generate social capital. According to Munene *et al.* 2005, individuals no longer identify strongly with many other community members, so feeling of closeness and identification are no longer adequate to motivate voluntary helpful acts.

Financial Knowledge and Financial Behaviour

The term financial knowledge has been defined by various researchers as any training in financial management (Godwin, 1994), to completion of a consumer education course, to a multi-item index of knowledge Hira (1992) and Mugenda (1990). Regardless of how financial knowledge has been defined and measured, it has been found to have a significant impact on financial management, more so when multi-item measures are used (Godwin, 1994; Godwin & Carroll 1986; Hira 1992; Mugenda 1990). To date very little in the financial management literature has been conducted on the relationship between financial attitudes and financial management (Godwin, 1994). Attitudes refer to the tendency or disagreement influencing the way an individual behaves (Tarkianinen & Sundqvist, 2005). No study has investigated the combined effect of financial knowledge and financial attitudes on financial management (Jodi & Phyllis, 1998).

Research in the psychology literature on attitude suggests that knowledge moderates the correspondence between attitudes & behaviour (Eagly & Chaiken, 1993). That is, knowledge affects the direction and strength of the relationship between attitudes and behaviours (Baron & Kenny, 1986). Only a few studies have investigated financial attitudes of the studies reviewed and only Godwin (1994) examined attitudes as an independent variable, thereby testing the impact of financial attitudes on financial management. She found out that a positive attitude toward planning (a 3 – item index) was the greatest predictor of cash flow management of newlywed.

Thus, the hypothesis are:

H1: Financial Knowledge is having a significant impact on Financial Behaviour.

H2: Cultural Values mediate between Financial Knowledge and Financial Behaviour.

Methodology

Generation of scale items

The items under different dimensions covering almost all the aspects of variables under study were generated from discussions with experts in the area of marketing, psychology and by an review of relevant literature. Financial knowledge was measured through the scale developed by Flynn & Goldsmith (1999). These measures were improved and used by Vanessa & Marlene (2005). Financial behaviour was measured through the scale developed by Vanessa & Marlene (2005). The responsible financial behaviour included controlling spending, paying bills on

time, planning for one's financial future, saving money and providing for one's self and family. The items for cultural values were developed from the scale of Dorfman and Howell (1998), Robertson and Hoffman (2000) Munene *et al.* (2005). On the basis of these sources, an instrument was framed for the collection of requisite data. Some items were kept in negative form so as to have internal cross-checking and to ensure the active involvement of respondents while filling the questionnaire.

Pilot Study

To evaluate the clarity and appropriateness of the questions contained in the questionnaire, which consisted of 49 items, a pilot survey was conducted in October 2014 on a sample of 30 respondents, with respondents with at least two years of experience, and working in the various businesses. To avoid duplication, six items were identified and deleted in pretesting and, therefore, were not considered for the final survey. The instrument was finally left with 27 questions, out of which 2 pertained to demographic profile, 1 belonged to general information, 10 items to measure Financial Knowledge (FC = Financial Charges (3 items), CM = Credit Management (4 items)

and IA = Investment Awareness (3 items), 5 items to measure Cultural Value (CV) and 12 items to gather information on Financial Behaviour (CS = Controlled spending (4 items), PF = Planning for Financial Future (4 items), SM= Saving Money (3 items). All responses were taken on a 5-point Likert scale, with 5 for strongly agree and 1 for strongly disagree.

Scale Development

To evaluate the clarity and appropriateness of the questions contained in the questionnaire, which consisted of 21 items, a pilot survey was conducted in October 2016 on a sample of 30 respondents, with respondents with at least two years of experience, and working in the various businesses. To avoid duplication, six items were identified and deleted in pretesting and, therefore, were not considered for the final survey. The instrument was finally left with 15 questions. The path estimates (CFA loadings) of the measurement model which are above 0.50; average variance extracted (AVE) which is above 0.50 and composite reliability (CR) is above 0.70 indicating convergent validity and internal consistency.

Table 1: Discriminant Validity for constructs

Construct	FC	CM	IR	CS	PF	SM	FK	FB
FC	0.852*							
CM	0.602	0.879*						
IR	0.514	0.552	0.839*					
CS	-	-	-	0.838*				
PF	-	-	-	0.517	0.844*			
SM	-	-	-	0.494	0.625	0.738*		
FK	-	-	-	-	-	-	0.703*	
FB	-	-	-	-	-	-	0.455	0.670*

(Source: Primary Data)

NOTE: FC = Financial Charges, CM = Credit Management, IR = Interest Rate, CS = Controlled spending, PF = Planning for Financial Future, SM= Saving Money)

In addition, the average variance extracted for each dimension exceeded 0.50, which indicates good convergent validity. Also, all constructs exhibit composite reliabilities well above the recommended threshold of 0.70 (Hair *et al.*, 2009). Discriminant validity analysis is estimated to examine the degree to which a variable is distinct from other variables (Hair *et al.*, 2009). Table II shows that each explained variance estimate on the diagonal is greater than the corresponding inter-factor squared correlation estimates below the diagonal (Malhotra *et al.*, 2007). Thus, Discriminant validity gets established, thereby implying that major constructs are unique. The reliability of the measurements was assessed for each construct. Reliability of a measure is being tested through the Cronbach alpha coefficient, which is the most commonly applied estimate. As all alpha values were above 0.70, the reliability of the data was established (Hair *et al.*, 2009) (Table II). The reliability and validity of the measurements were assessed with confirmatory factor

analyses for each dimension. Further, for all constructs (i.e. Financial Knowledge and Financial Behaviour), item loadings were positive, high in magnitude and statistically significant, indicating unidimensionality and establishing convergent validity (Malhotra and Dash, 2010). Both AVE and CR are other measures that are used to test convergent validity. AVE is computed as the total of all squared standardized factor loading divided by the number of items. In other words it is average squared factor loadings. The good rule of thumb is, AVE = .5 or higher indicates adequate convergence. AVE measure was computed for each latent construct in the measurement model as shown in Table 2. CR is computed from the squared sum of standardized factor loadings by squared sum of standardized factor loadings plus sum of indicator measurement error for each construct

Table 2: Scale Reliability and Convergent Validity

S. NO.	Variable	Scale	Item	Loadings	AVE	CR	C-Alpha
1.	Financial Knowledge (FK)	FC	FC1	0.88**	0.76	0.92	0.87
			FC2	0.80**			
			FC3	0.93**			
		CM	CM1	0.88**	.72	.88	0.84
			CM3	0.85**			
			CM4	0.81**			
		IR	IR1	0.97**	0.92	0.97	0.84
			IR2	0.97**			
			IR3	0.94**			
2.	Financial Behavior (FB)	CS	CS2	0.89**	0.77	0.93	0.85
			CS3	0.87**			
			CS4	0.87**			
		PF	PF1	0.79**	0.52	0.76	0.78
			PF2	0.74**			
			PF4	0.61**			
		SM	SM1	0.82**	0.75	0.90	0.83
			SM2	0.90**			
			SM3	0.89**			
3.	Cultural Values (CV)		CV2	0.90**	0.85	0.96	0.89
			CV3	0.97**			
			CV4	0.93**			
			CV5	0.91**			
Source: Primary Data							

(NOTE: AVE = Average Variance Extracted, CR = Construct Reliability)

The results of CFA indicate that the model fit the data as Chi-square (χ^2) value = 1279, DF = 367, χ^2/df = 3.48, specifically GFI = 0.916, CFI = 0.937 and RMSEA = 0.080. It is revealed that all the goodness and badness indices are met by the model (in the acceptable range) therefore data fits the model. Moreover, factor loading, average variances extracted and construct reliability coefficients yield measurements within acceptable range. This display constructs validity. Thus data collected for the present study

supports the convergent validity and the measurement theory. However CM2, CS1, PF3 and CV1 were subjected to deletion due to lower factor loadings. Thus reducing final questionnaire from 27 statements to 23 statements, which were used for final data collection.

Sample design and data collection

All responses were taken on a 5-point Likert scale, with 5 for strongly agree and 1 for strongly disagree. On the basis of pilot testing results, sample size was calculated using the formula given by (Yamane, 1967):

$$SS = \frac{N}{1 + N(e)^2}$$

Here, SS = sample size, N = population, e = acceptable sampling error

For current study the SS = 495 at 0.05 significance level, percentage proportion of population (p) = 0.5 and margin of error to be 5 per cent. Thus, the final sample size so calculated arrived at 220. Systematic random sampling was used to select the respondents for the sample. It is considered most appropriate where the sampling frame is available which was obtained from Entrepreneurship Development Institute Kashmir.

A total of 220 questionnaires were distributed among the respondents; however, usable responses were obtained from 200 respondents only because of reasons such as few respondents returned incomplete questionnaires, few misplaced the questionnaire and few of them did not return even after two to three visits.

Data Purification

Prior to the analysis of the data, negatively worded items were

reversed and normalcy and linearity was satisfied before the application of parametric tests. To accomplish this at the outset, outliers were determined to remove extreme responses. Item-to-item outliers were determined and 4 respondents were observed who gave abnormal responses. Thus, final usable sample size arrived at 200. Subsequent to the outlier, the skewness and kurtosis measures of the data were checked to assess the normality of the data. The skewness values were in the range 0.027 to 0.056, while kurtosis values were found to be in the range 0.045 to 0.356, which established normal distribution of the data.

Data Analysis

SPSS and AMOS software was used for the conduction and execution of research methodology applied for the present study. Complementary to the SPSS and AMOS, graphical demonstration of the empirical scores was done by the means of EXCEL software. Further, Structural Equational Modeling where used to test the hypothesis under study.

Sample profile

Demographic profile of the respondents is given in Table V. The majority of the respondents were males (88 per cent), having minimum qualification +2 (52%). Further, among these beneficiaries, 31 per cent were from sheep business, 17 per cent from dairy business, 46 per cent from poultry business and 06 per cent from others (like fisheries etc). Further from Table 3 it is clear that Mean values on the latent variables of Financial Knowledge is low with comparatively high values on Financial Behaviour and higher on Cultural Values. Thus respondents are having low Financial Knowledge Medium level of Financial Behaviour and higher Cultural Values.

Table 3: Demographic profile of respondents

Serial No.	Variable	Variable group	No. of respondents	(%)
1	Gender	Male	176	88
		Female	24	12
		Total	200	100
2	Education	12th	104	52
		UG Academic	56	
		UG Professional	5	
		PG Academic	19	
		PG Professional	16	

Serial No.	Variable	Variable group	No. of respondents	(%)
		Total	200	8
		Unmarried	102	100
		Total	200	
3	Type of business	Sheep farming	62	31
		Dairy farming	34	17
		Poultry	92	46
		Others	12	6
		Total	200	100

(Source: Primary Data)

Hypothesis Testing and Structural Equational Modeling

Structural equation modeling (SEM) was used to assess the hypotheses of the study, as it is considered to be one of the most significant techniques to understand multiple relationships. The model involves examination of direct and indirect relationship between Financial Knowledge and Financial Behaviour through a mediator Cultural Value (Figure 3). The mediation test was performed using AMOS 20 through bias-corrected percentile bootstrap with 95% confidence interval for standardized effects.

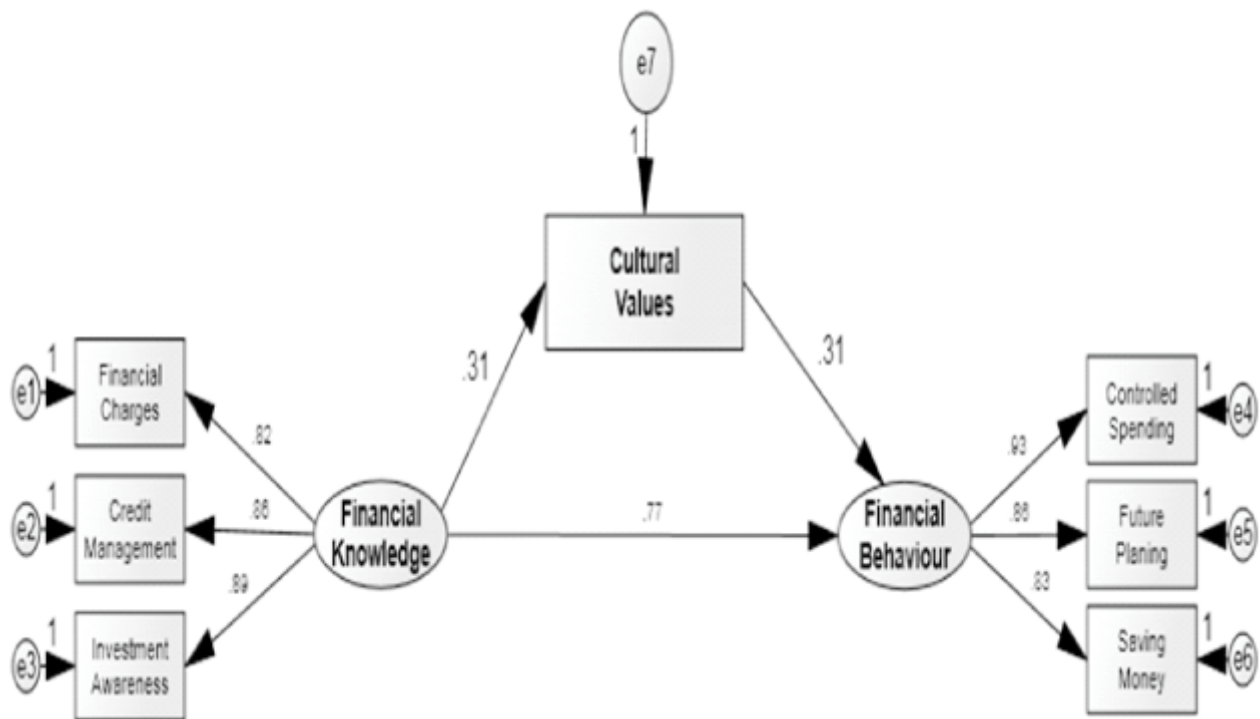
Figure 2: Impact of Financial Knowledge on Financial Behaviour



(Source: From Primary Data, AMOS 20)

Table 4 shows the total effects, direct effects and indirect effects of the variables Financial Knowledge and cultural values on Financial Behaviour. The direct relationship between Financial Knowledge Financial Behaviour and Cultural Valued are significant ($p = 0.004$ and 0.000) as well as indirect relationship through Cultural Values are also significant ($p = 0.000$ and 0.000 .) proving partial mediation of Cultural Values between Financial Knowledge and Financial Behaviour as both direct and indirect paths are significant. Further Financial Knowledge determines 74% of Financial Behaviour (as Coefficient of Determination $R^2 = .74$) with $\beta = .72$ in mediational model. However β value in model II is .77 and $R^2 = .60$. Highlighting the fact that Cultural Values enhances the explanation of Financial Behaviour (from 60% to 74%) but suppresses the impact of Financial Knowledge as there is evident conflict between the Cultural Values and present financial system.

Figure 3: Mediation of Cultural Values between Knowledge and Financial Behaviour



(Source: From Primary Data, AMOS 20)

The Goodness of fit Measures are in acceptable thrush hold as $GFI/DF = 1.987$, $GFI = 1.00$, $AGFI = 0.880$ and $RAMSEA = 0.072$. Hence H3 is accepted fully and H4 partially as there is partial mediation of Cultural Values in between Financial Knowledge and Financial Behaviour.

Table 4: Total, direct, indirect effects of mediation

Total Effects (Group 1 -Default model)						
Impact of→	Financial Knowledge		Cultural Values		Financial Behaviour	
Impact on ↓	Std. Regression Estimates	p-value	Std. Regression Estimates	p-value	Std. Regression Estimates	p-value
Cultural Values	.309	0.004	....	.....	....	.....
Financial Behaviour	.811	0.000	.305	0.000	.....	.....
Direct Effects						
Cultural Values	.309	0.000	....	.....	....	.....
Financial Behaviour	.716	0.013	.305	0.000	....	.....
Indirect Effects						
Cultural Values	.000	...	....	...	....	...
Financial Behaviour	.094	0.000	....	...	....	...

(Source: Primary Data)

Table 5: Results from Hypotheses testing

Hypothesis No.	Statement	Results
H1:	Financial Knowledge is having a significant impact on Financial Behaviour.	Accepted
H2:	Cultural Values mediate between Financial Knowledge and Financial Behaviour.	Partially Accepted

Discussion of Findings

The general finding has been that financial knowledge has a significant and positive relationship with the financial behaviour. This means that financial behaviour to a greater extent is dependent on financial knowledge and cultural values. This is in agreement with Taylor and Overbey (1999) and O'Neill et al, (1999) who all concluded that finance knowledge contribute to consumer financial behaviour. The study found out that Financial Knowledge and Cultural Values can explain up to 74% of the Financial Behaviour. The findings also showed that there is a significant and positive relationship between Financial Knowledge and Financial Behaviour. This means that the more knowledgeable one is as far as finances are concerned, the better he/she is likely to manage his/her finances and so they will exhibit financially commendable behaviour. Furthermore Hogarth and Hilgert (2002) and Hilgert, Hogarth and Beverly (2003) found that consumers who are financially knowledgeable are more likely to behave in financially responsible ways. According to Eagly and Chaiken, (1993) cultural value moderates the correspondence between attitudes and behaviour. This means that cultural value affects the direction and strength of the relationship between attitudes and behaviours (Baron & Kenny, 1986).

There was a significant positive impact of cultural values and financial behaviour. This means that more favorable the values of an individuals, the better the manner in which they will manage their finances. These findings are consistent with the literature which says that if culture is properly managed it can become a source of competitive advantage Schneider and Barsoux, (2003). Fontaine (2005) also urged that individual's attachment to cultural values is contingent on their level of trust, belief in self efficacy and pressure from their peers. Munene et al. (2005) also stated that when societies become more complex and extended kinship ties lose, their central role in bonding societal members together, cultural embeddedness can no longer provide grounds for the bonding mechanisms that generates social capital. Munene et al.

(2005) stated that cultural embeddedness can serve as the grounding for bounding expressed in close attachment to other members of the community. In societies whose cultural emphasizes embeddedness values like forgiving, security, social order, reciprocation of favors, solidarity with others in the community, trust and tolerance in group members are normal states of affairs.

Conclusion and suggestions

The study evidently depicted the significance of Financial Knowledge and Cultural Values for effective and efficient Financial Behaviour. Further consideration of Cultural Values in policy/scheme formulation leads to sustainable financing with a proper tradeoff between Cultural Values and policy formulation. Furthermore study identified lower level of Financial Knowledge and effective role of Cultural Values in explaining Financial Behaviour. As beneficiaries are embedded with higher cultural values forcing them to make a choice under stress between cultural and present financial aspects that doubts the sustainability and policy effectiveness. As many individuals have different financial behaviours due to lack of basic financial management skills leading to skyrocketing consumer debts, low saving rates, lost job opportunities, bankruptcy and perpetual cycle of poverty. Based on the findings of this study the following suggestions are mentioned below: Incorporation of Financial Literacy in EDI training programmes as these programmes are sponsored by SEBI (Security Exchange Board of India) Govt. of India. Proper consideration of Cultural Values in scheme/policy formulation. There is need to obtain information that will serve as a baseline to determine progress.

Limitations and scope for Further Research

The findings of this study were limited in the contextual scope due to the sample size, time and resource constraints, therefore further surveys should be carried out to generate more representative analyse. The study should be expanded to find out what measures should be used to establish the influence of all variables studied on Financial Behaviour of other Organizations. There is need to carry out a study on people in informal employment sector to examine their behaviour with the same variables.

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Stock Indices and Exchange Rates: A Study on their Relationship in BRIC Economies with Special Reference to India

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Abstract

Association of stock markets and exchange rate is well researched area. This paper is aimed at studying association of stock indices and exchange rate in BRIC economies (i.e. Brazil, Russia, India, and China). Exchange rates of Brazilian, Russian, and Chinese currencies are taken vis-à-vis value of Indian currency. BOVESPA (Brazil), RTSI (Russia), Nifty (India), and SSE (China) are taken as stock indices to study their correlation with Exchange rates.

The daily data for indices and currencies were analyzed for five years from 01.04.2013 to 31.03.2018 for long term, and for short term, the time period of one month from 01.04.2018 to 11.04.2018 was used. The correlation technique is applied to check the association. Since the data series were not normal, nonparametric correlation technique, i.e. Spearman's Rank Correlation is used. The data was analyzed for long term and short term.

It was found that out of total 18 correlation coefficients, 14 were significant at 5 percent level of significance. It was also observed that Indian index (Nifty) had negative correlation with the exchange rates in short term. While in long term if the indices are significantly correlated, the correlations between exchange rates and indices were also found significant.

Key Words : *Correlation, Exchange Rate, Stock Indices*

Introduction

BRIC nations (i.e. Brazil, Russia, India, and China) have emerged as important players in global trade. The growth of their share in global market is increasing. Similarly, the intra-BRIC trades are also increasing exponentially. In such a situation the role of exchange rates amongst BRIC economies play important role.

The movements in exchange rate are result of many factors, such as oil prices, imports, exports, interest rate (Khan, 2014). Few other factor such as country's debt, GDP, political stability etc. also impact exchange rates (Patel et al, 2014). Fluctuations in exchange rate are also result of speculation (Duarte and

Stockman, 2004). The association between stock indices and exchange rate is a focus of this study. Stock markets as well as exchange rates are dynamic in nature and are highly volatile. Moreover, any changes in exchange rate is crucial to the businesses that are into cross border trades. Depreciation in domestic currency helps local firms to increase their exports (Dornbusch and Fisher, 1980).

In this context, the purpose of this study is to study the association between stock indices and exchange rates of BRIC economies with special reference to India. The researcher believes that nature of exchange rate fluctuations is different in case of long term and short term. So, this study is undertaken for long term as well as short term.

Stand of BRIC economies in the World

BRICS nations together represent 26 percent of earth and 46 percent of world's population. From economic perspective, BRICS economies contribute 18 percent of the world's GDP. As compiled by World Trade Organization, in the ten years between 2001 and 2011, BRICS economies' contribution in global exports is doubled from 8 percent to 16 percent.

Intra-BRICS trade is also increasing exponentially. In the ten years between 2002 and 2012 it increased by 922 percent from \$ 27 billion to \$276 billion. India eyes on increasing intra-BRICS trade to \$500 billion by 2020.

These all statistics are evident to the increasing importance of BRICS economies and their intra-trade. In the scenario, exchange rates amongst BRICS nations play important role. However, in this study South Africa was excluded and study is taken for BRIC economies. Since exchange rates got affected by many factors, this study took into account the impact of stock indices on exchange rates with Indian perspective.

Literature Review

Linkage between exchange rates and stock indices is a well researched area. Since years, researchers and market practitioners have shown interest in finding relationship between

stock indices and exchange rates. This section represents major literatures studied on the relationship between exchange rates and stock indices.

Branson (1983) with the objective of establishing stock oriented models for exchange rate determination inferred directional impact between stock prices and exchange rates. Frankel (1983) was also having similar study with similar findings.

Yang and Doong (2004) studied the stock market movements and exchange rate and found that stock market movements have significant impact on exchange rates. Their study comprised of twenty years data from 1979 to 1999 and based for G7 nations. Phylaktis and Ravazzolo (2005) used Granger causality test and cointegration analysis and found positive link between stock market indices and foreign exchange rates. Pan et al. (2007) based their study for East Asian economies and studied seven economies to arrive at the conclusion of bidirectional relationship between exchange rates and stock markets by using VAR model.

Chkili et al. (2011) studied four emerging economies and investigated for dynamic relationship between exchange rates and stock returns. They used Markow-Switching EGARCH model and concluded positive relationship. Diamandis and Drakos (2011) took sample of four Latin American nations and investigated long term and short term relationship between stock markets and foreign exchange and found positive relationship between them.

Lin (2012) studied the co-movement of exchange rates and stock markets for Asian economies. His inference was interesting which mentioned stronger co-movement during the time of crisis. Chkili and Ngyuen (2014) studied BRICS economies and found dynamic linkages between stock market and exchange rates.

It was observed that majority of the above-mentioned studies conclude a positive relationship between stock indices and exchange rates. Moreover, it was also observed that study on BRIC economies received less research attention and majority of the studies focuses on long term relationship. While the focus of this study is to examine relationship between exchange rates and stock indices of BRIC economies in long term as well as short term.

Research Methodology

The principal aim of the study is to measure the association between exchange rate and different stock indices of BRIC economies in long term and short term. The sample of the study included exchange rates of other BRIC economies with respect to

Indian currency. So, the exchange rates taken for the study are BRL/INR (Brazil), RUB/INR (Russia), and CNY/INR (China). The respective stock indices taken for the study are BOVESPA (Brazil), RTSI (Russia), Nifty (India), and SSEC (China).

The time period for the study was divided into long term and short term. The long term was referred to as five years from 01.04.2013 to 31.03.2018. Total observations during these five years were 1322 for Brazil, 1306 for Russia, and 1307 for China. For short term the time period of thirty working days from 01.03.2018 to 11.04.2018 was considered. All computations were performed on daily closing data of respective exchange rates and indices.

Both the data sets for short term and short term were checked for normality and many series were found not normal. Kolmogorov-Smirnov and Shapiro-Wilk tests were employed to check the normality of the data. Since the data is time series it's not usual to achieve normality with actual data. So instead of converting data into first differences or log to achieve normality, the nonparametric correlation technique was employed. Since the aim was to study the association between exchange rates and stock indices, the Spearman's Rank Correlation technique was employed for data analysis.

Data Analysis and Discussion

Before applying correlation, the data was checked for normality. The following two tables display the statistics of normality.

Table 1: Tests of Normality (Long Term)

Tests of Normality (Long Term)						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
BOVESPA	.128	1306	.000	.917	1306	.000
BRL/INR	.179	1306	.000	.901	1306	.000
NIFTY	.080	1306	.000	.967	1306	.000
RTSI	.049	1306	.000	.978	1306	.000
RUB/INR	.272	1306	.000	.821	1306	.000
SSEC	.124	1306	.000	.918	1306	.000
CNY/INR	.080	1306	.000	.943	1306	.000
a. Lilliefors Significance Correction						

All seven series were found not normal as per KS and SW tests. The data taken for study is time series in nature and both exchange rates data and index data are daily data. The basic nature of these types of data is highly volatile and subject to many abnormal swings. In such a situation, it is difficult to attain normality in such data. Researcher in this study accepted the fact that data is not normal and applied nonparametric correlation technique to analyze the data.

Table 2: Tests of Normality (Short Term)

Tests of Normality (Short Term)						
	Kolmogorov-Smirnov ^a			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
BRL/INR	.101	30	.200*	.959	30	.291
BOVESPA	.076	30	.200*	.991	30	.995
RUB/INR	.340	30	.000	.630	30	.000
RTSI	.308	30	.000	.693	30	.000
CNY/INR	.158	30	.053	.936	30	.071
SSEC	.203	30	.003	.873	30	.002
NIFTY	.132	30	.190	.924	30	.034
* This is a lower bound of the true significance.						
a. Lilliefors Significance Correction						

In case of short term, BRL/INR, BOVESPA, CNY/INR, and Nifty were found normal as per KS test as well as SW test. Rest of the series, RUB/INR, RTSI, and SSEC were found not normal as per both the tests. Since majority of the data is not normal the researcher opted to apply for nonparametric correlation technique, i.e. Spearman's Rank Correlation.

Correlation Matrices (Long Term)**Table 3: Correlation Matrix between BOVESPA, NIFTY and BRL/INR (Long-term)**

Correlations				
		BOVESPA & BRL/INR	BOVESPA & NIFTY	NIFTY & BRL/INR
BRAZIL	Spearman Correlation	.058*	.665**	-.487**
	Sig. (2-tailed)	.034	.000	.000
**. Correlation is significant at the 0.01 level (2-tailed).				

BOVESPA and Nifty were significantly correlated. The correlation between Nifty and BRL/INR were also found significantly correlated, but the correlation was negative. However little, but significant correlation (at 5 percent significance level) was observed between BOVESPA and BRL/INR. Table 3 shows that high correlation between both the exchanges result into significant correlations between both the indices and exchange rate. In spite of positive correlation between both indices, BRL/INR was negatively correlated with both the indices.

Table 4: Correlation Matrix between RTSI, NIFTY and RUB/INR (Long-term)

Correlations				
		RTSI & RUB/INR	RTSI & NIFTY	NIFTY & RUB/INR
RUSSIA	Spearman Correlation	.892**	-.309**	-.449**
	Sig. (2-tailed)	.000	.000	.000
**. Correlation is significant at the 0.01 level (2-tailed).				

Unlike BOVESPA and Nifty, RTSI and Nifty were negatively correlated. However the correlation was significant. RUB/INR was also significantly correlated with both the indices. It was noticeable that RUB/INR was negatively correlated with Nifty and significant positive correlation with RTSI. It was interesting to study the relationship between both indices and the exchange rate. RUB/INR was highly positively correlated with RTSI and highly negatively correlated with Nifty.

Table 5: Correlation Matrix between SSEC, NIFTY and CNY/INR (Long-term)

Correlations				
		SSEC & CNY/INR	SSEC & NIFTY	NIFTY & CNY/INR
CHINA	Spearman Correlation	.143**	.728**	-.216**
	Sig. (2-tailed)	.000	.000	.000
**. Correlation is significant at the 0.01 level (2-tailed).				

Significant positive correlation was observed between SSEC and Nifty. It was interesting to observe that Nifty had negative and little but significant correlation with CNY/INR. As against that CNY/INR was positively correlated with SSEC. India and China share close trades and competition in several sectors. Hence, the impact of such factors can be higher than the impact of respective indices. This may be one of the reasons of lower correlations between both indices and the exchange rates.

Correlation Matrices (Short Term)**Table 6: Correlation Matrix between BOVESPA, NIFTY and BRL/INR (Short-term)**

Correlations		BOVESPA & BRL/INR	BOVESPA & NIFTY	NIFTY & BRL/INR
BRAZIL	Spearman Correlation	.671**	.491**	-.169
	Sig. (2-tailed)	.000	.006	.371
**. Correlation is significant at the 0.01 level (2-tailed).				

Unlike for long term, in short term correlation between both indices is significant. It was surprising for the researcher to observe little or almost nil and insignificant correlation between Nifty and BRL/INR in short term. However, significant positive correlation was found between BOVESPA and BRL/INR. BOVESPA and BRL/INR are negatively correlated in long term but in short term they are positively correlated.

Table 7: Correlation Matrix between RTSI, NIFTY and RUB/INR (Short-term)

Correlations		RTSI & RUB/INR	RTSI & NIFTY	NIFTY & RUB/INR
RUSSIA	Spearman Correlation	.800**	-.071	.054
	Sig. (2-tailed)	.000	.710	.777
**. Correlation is significant at the 0.01 level (2-tailed).				

The correlation between RTSI and Nifty were negative and insignificant in short term. Nifty was found to be positively correlated in with RUB/INR but the correlation was insignificant. The correlation between Nifty and RUB/INR was also found negative and insignificant. But, RTSI was found to be positively and significantly correlated with RUB/INR in short term.

Table 8: Correlation Matrix between SSEC, NIFTY and CNY/INR (Short-term)

Correlations		SSEC & CNY/INR	SSEC & NIFTY	NIFTY & CNY/INR
CHINA	Spearman Correlation	-.601**	.367*	-.364*
	Sig. (2-tailed)	.000	.046	.048
**. Correlation is significant at the 0.01 level (2-tailed).				

The correlation between SSEC and Nifty was found insignificant in short term at 5 percent significant level as against 1 percent

significant level. The correlation of the exchange rate and Nifty was again found negative and significant at 5 percent. The same was the observation in the cases of BRL/INR and RUB/INR. However, in the line with inferences found in case of Brazil and Russia, the correlation between SSEC and CNY/INR was found significant.

Inferences of the Study**Long Term**

- 1.If the indices are significantly correlated, the correlations between exchange rates and indices are also significant.
- 2.The higher the correlation between both indices, the lower the correlation between exchange rate and foreign index.
- 3.The exchange rates were negatively correlated with Indian index.
- 4.Positive correlations were found between foreign index and the exchange rate, with an exception of BOVESPA and BRL/INR.

Short Term

- 1.Exchange rates were better correlated with foreign country's index than Indian index.
- 2.Correlations of all exchange rates with foreign country's index were statistically significant, and correlations with Indian index were insignificant.
- 3.The correlations between exchange rates and Indian index were negative and insignificant in short term.
- 4.The more the degree of correlation between indices, the lower the correlation between Indian index and exchange rate.

Conclusion

The association of stock indices and exchange rate has always grabbed the interests of researchers and market practitioners. The researcher believes that behavioral association of exchange rate and stock indices are different in long term and in short term. This study examined the relationship between stock indices and exchange rate for long term and short term both. It was found that majority of the correlations are significant. In short term, exchange rates were negatively correlated with Indian stock index. While in long term it was found that if the indices are significantly correlated, the correlations between exchange rates and indices are also significant. The inferences to the study are in line of the almost all literatures studied.

Considering the above discussion and inferences, this study can be useful to market practitioners and business houses which are into cross border trades. However, more factors that can have

impact on exchange rate are required to be considered to obtain better results.

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Sources of Data and Information

- Data for Indices and Exchange Rates
<https://www.investing.com>
- Economic Data and Trade Statistics
<http://brics.itamaraty.gov.br/about-brics/economic-data>
- We should work together to oppose trade protectionism: BRICS
<https://economictimes.indiatimes.com/news/economy/foreign-trade/we-should-work-together-to-oppose-trade-protectionism-brics/articleshow/58258671.cms>
- PM Modi doubles intra-BRICS trade target to \$500 bn by 2020
<https://www.firstpost.com/business/pm-modi-doubles-intra-brics-trade-target-to-500-bn-by-2020-3056090.html>
- Intra-BRICS trade: An Indian perspective
<https://www.tralac.org/news/article/10701-intra-brics-trade-an-indian-perspective.html>
- Intra-BRICS Trade: An Indian Perspective
<https://www.eximbankindia.in/Assets/Dynamic/PDF/Publication-Resources/ResearchPapers/80file.pdf>
- Trade Relations among BRICS Countries – Intra-BRICS Trade Statistics
<https://www.exportgenius.in/blog/trade-relations-among-brics-countries-intrabrics-trade-statistics-161.php>

Annexure

Descriptive Statistics – Long Term (BOVESPA, BRL/INR and Nifty)

Descriptive Statistics			
	Mean	Std. Deviation	N
BOVESPA	56646.113	10082.862	1322
BRL/INR	22.142	3.504	1322
NIFTY	8072.834	1353.132	1322

**Descriptive Statistics – Long Term
(RTSI, RUB/INR and Nifty)**

Descriptive Statistics			
	Mean	Std. Deviation	N
RTSI	1087.826	206.437	1306
RUB/INR	1.294	0.340	1306
NIFTY	8078.058	1358.329	1306

**Descriptive Statistics – Short Term
(RTSI, RUB/INR and Nifty)**

Descriptive Statistics			
	Mean	Std. Deviation	N
RTSI	1235.196	57.282	30
RUB/INR	1.128	0.029	30
NIFTY	10251.540	132.819	30

**Descriptive Statistics – Long Term
(SSEC, CNY/INR and Nifty)**

Descriptive Statistics			
	Mean	Std. Deviation	N
SSEC	2924.792	644.515	1307
CNY/INR	9.948	.360	1307
NIFTY	8078.617	1357.960	1307

**Descriptive Statistics – Short Term
(SSEC, CNY/INR and Nifty)**

Descriptive Statistics			
	Mean	Std. Deviation	N
SSEC	3224.315	68.666	30
CNY/INR	10.302	0.041	30
NIFTY	10251.540	132.819	30

**Descriptive Statistics – Short Term
(BOVESPA, BRL/INR and Nifty)**

Descriptive Statistics			
	Mean	Std. Deviation	N
BOVESPA	85041.568	832.492	30
BRL/INR	19.704	0.297	30
NIFTY	10251.540	132.819	30

Analysis of Profitability and Dividend Payout: A Study on Some Select Companies in Indian Paint Industry

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Abstract

The Indian paint industry is over 100 years old. Its beginning can be traced back to the setting up of a factory by Shalimar paints in Calcutta in 1902. The Indian paint industry has two main segments- industrial and decorative paints. Industrial paints are used for protection against corrosion and rust on steel structures, vehicles, white goods and appliances. Due to the rapid urbanization, increasing disposable incomes and growing infrastructure, a robust growth in the Indian paint industry is anticipated. Ten years data from year 2008 to 2017 of the four paint companies in India viz, Asian paints, Kansai Nerolac, Berger Paints and Akzo Nobel have been collected for the study. The objective of the study is to find out the correlation and regression between profitability (net profit, return on net worth and return on capital employed) and dividend payout ratio of the select companies. It is found that in case of Asian Paints there is correlation and regression between profitability and dividend payout ratio.

Keywords : Decorative paints, dividend payout ratio, net profit, profitability.

Introduction

India is the seventh largest country and largest democracy in the world. It is one of the fastest growing economies in the world, second only to the China. India is also the second largest paint market in Asia with an annual demand of over two million tonnes again only to China. The Indian paint industry has been historically polarized into the large organized and the smaller unorganized sectors. The organized sector accounts for approximately 65% of the market. With more global companies entering the Indian market it is surprising that it is gaining increasing share at the expense of the unorganized players. The Indian paint industry is over 100 years old. Its beginning can be traced back to the setting up of a factory by Shalimar paints in Calcutta in 1902. The major players in the Indian paint industry are Asia paints, Goodless Nerolac, Berger, ICI and Shalimar. Recently world leaders like Akzo Nobel, PPG, Du Pont and BASF

have set up base in India.

The Indian paint industry has two main segments- industrial and decorative paints. Industrial paints are used for protection against corrosion and rust on steel structures, vehicles, white goods and appliances. Decorative paints are used in protecting valuable assets like buildings. Northern and western India hold the maximum demand for paint in the market spurring demand in southern and eastern regions is driving the paint market further. The increasing demand from the rural markets, huge potential for innovative technologies, soaring housing industry and extensively varied product portfolios are propelling the demand for paint throughout the country. The Indian paint industry has moved forward from a predominant decorative paint market to a more diversified market with seasonal fluctuations. Several factors that have contributed to the rapid growth of the Indian paint industry include adoption of latest technologies and innovative product launch. Also given rapid urbanization, increasing disposable incomes and growing infrastructure it is anticipated that the Indian paint industry will grow with a CAGR of around 14% during 2015-16 to 2019-20. The Indian paint market is expected to reach Rs.70,875 crore by 2019-20 from around Rs.40,300 crore in 2014-15, the paint industry's apex body projected (according to the report published on Business Standard dated 6th January, 2017). One of the major challenges faced by Indian paint industry is quick drying of paint. There are many factors that contribute in quick drying of paint. Apart from the composition, thickness of the coating, environmental conditions play a crucial role. Out of the weathering conditions, humidity and temperature are the lead players. Every paint manufacturing industry issues different guidelines for its products. It is always advisable for the applicator to read the specifications before starting the paint.

Literature review

Pandey (2001) looks at the corporate dividend payout behaviour of companies listed on the Kuala Lumpur stock exchange during 1993-2000. He categorizes the sample into six industries for examining the variation in the payout ratio. He also establishes a

relationship between current earnings and past dividend rate. He finds that the Malaysian companies (by following Lintner's model) exhibit unstable dividend behaviour with high adjustments in dividend payments in order to meet the target payout ratio.

Myers (2004) finds strong support for earnings, profit margin, institutional ownership and debt-equity ratio on the dividend decision.

Eriotis (2005) finds that Greek firms have a long-run constant dividend payout policy. He adjusts the firms' distributed earnings and size in the Lintner model and reports that an increase in the earnings does not change the dividend distribution pattern of firms.

Kania and Bacon (2005) find that variables such as sales growth, expansion and insider ownership have a negative impact on dividend decision but institutional ownership has an inverse relation with dividend payout, which is contrary to the existing literature.

Denis and Osobov (2008) find that the tendency for paying dividends declined for countries such as United States, Canada, United Kingdom, Germany, France and Japan during 1994-2002. They also report that the international evidence does not support the investors' preference for dividend, the signaling and the clientele interpretations as prominent variables. Rather, they go along with the distribution of free cash flow as the chief element of the dividend decision.

Kevin (1992) analyzes the dividend payment behaviour of 650 Indian companies during September 1983 to August 1984 and finds that profitability and earnings of the firms are the two foremost factors determining dividends. He concludes that Indian firms strive for achieving a stable dividend rate. However, keeping in view that the time period of his study was only one year; his results cannot be taken as conclusive.

Mahapatra and Sahu (1993) find that cash flows, current earnings and past dividends are prominent factors that have an impact on the dividend decision. Their results are in contrast to Lintner's model.

Bhat and Pandey (1994) find that current year's earnings, pattern of past dividends, expected future earnings, changes in equity base of the firm have an impact on the dividend decision.

Narasimhan and Asha (1997) look at the changes in dividend tax regime proposed in the Indian Union Budget of 1997-98 and analyze the impact of dividend tax on a firm's dividend decision. They conclude that the burden of tax payment fell in the hands of

companies rather than their shareholders.

Mohanty (1999) studied more than 200 Indian companies for a period of fifteen years to understand the relationship between bonus-issuing and dividend-paying behaviour of companies. He found that in the Indian context, it is the dividend rate that is an important determinant of dividend policy in comparison to the dividend payout ratio.

Reddy (2002) analyzes the trends and determinants of dividend of all Indian companies listed on two major Indian stock exchanges—The Bombay Stock Exchange (BSE) and The National Stock Exchange (NSE) during 1990-2001. He investigates three factors viz., number of firms paying dividend, average dividend per share and the average payout. His results indicate that only few companies maintain the dividend payout rate and that firms forming a part of small indices pay higher dividend compared to firms forming a part of broad market indices. Deviations in the tax regime are also examined using the trade-off theory and it is found that this theory does not apply to the Indian corporate sector. He concludes that the omission of dividends have information content i.e. such companies expect lower earnings in the future whereas the same does not hold true in case of dividend initiations.

Anand (2004) questioned 81 CFOs to find out the determinants of dividend policy of Indian companies. He finds that Indian companies use dividend policy as a signaling mechanism to convey information about their present and future prospects, therefore, affecting their market value. He also reports that while designing a dividend policy, companies take into consideration the investors' preference for dividends and the clientele effect.

Bhayani (2008) has examined the influence of earnings and lagged dividend on dividend policy of companies listed on the BSE. He found that the current year's earnings is the foremost factor affecting the dividend behaviour of a firm and concludes that Indian Decision, Vol. 37, No.2, August, 2010 The Determinants of Corporate Dividend Policy 66 companies follow a stable cash dividend policy.

Kanwal and Kapoor (2008) examined the dividend policies of companies in the information technology sector in India. They explore various factors such as profitability, cash flows, corporate tax, sales growth and growth opportunities that have an impact over the dividend policies of such companies.

Sobha rani and Patha Sarathi (2013) focused on the determinants of dividends and its performance of select pharmaceutical companies in India. This study evaluates the

performance of various pharmaceutical companies and their annual compound growth rate.

Objectives of the study

The objectives of financial management are to maximization of profit and maximization of company's and shareholders' wealth. Shareholders wealth maximization can be done by appreciation of prices of shares they held and by giving cash or share dividend to them. The objective of the study is to measure and present the relationship between profitability and dividend of the four select paint companies in the Indian paint industry.

Research Methodology

Selection of Data : Four paint companies in India viz, Asian paints, Kansai Nerolac, Berger Paints and Akzo Nobel have been selected on the basis of their market capitalization amounting more than Rs.5,000 crores as on 10.12.2017.

Collection of Data : This study is based on secondary data only. The secondary data have been collected from www.moneycontrol.com and www.morningstar.in. Editing, classification and tabulation of the data collected from the above mentioned sources have been done as per the requirements of the study.

Analysis of Data : For analyzing the data simple statistical techniques like measures of Karl Pearson's simple correlation matrix and multiple correlation and regression analysis have been used.

Analysis and interpretation

Before starting analysis and interpretation a brief discussion on the select parameters is done in the following way:

Net profit margin: It is a ratio of net profit and sales. Net profit margin = Net profit/ sales.

Return on capital employed: This is a financial ratio that measures company's profitability and the efficiency with which its capital is employed. Return on capital employed = Earnings before interest and taxes/ capital employed.

Return on net worth : Return on net worth is the ratio of net income returned as a percentage of shareholders equity. Return on net worth = Net income/ shareholders equity.

Dividend payout ratio: It is the ratio between dividend per share and earnings per share.

Table 1: Correlation matrix of net profit (NP), return on net worth (RONW), Return on Capital Employed (ROCE) and Dividend Payout Ratio (DPR) of Asian Paints

	NP	RONW	ROCE	DPR
NP	1			
RONW	0.195175	1		
ROCE	0.274914	0.995227	1	
DPR	-0.69053	-0.7746	-0.8148	1

(Source: Calculated by author)

Table 1 shows the correlation between profitability and dividend payout ratio of Asian paints. There is positive correlation between net profit and return on net worth (RONW), return on capital employed and return on net worth (RONW), return on capital employed are positively correlated. There is negative correlation between dividend payout and the three ratios of profitability.

Table 2: Correlation matrix of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) and dividend payout ratio (DPR) of Kansai Nerolac

	NP	RONW	ROCE	DPR
NP	1			
RONW	0.928981	1		
ROCE	0.952869	0.995941034	1	
DPR	-0.57718	-0.749976012	-0.731488091	1

(Source: Calculated by author)

Table 2 shows the correlation between profitability and dividend payout ratio of Kansai Nerolac. There is positive correlation between net profit and return on net worth (RONW), return on capital employed and return on net worth (RONW), return on capital employed are positively correlated. There is negative correlation between dividend payout and the three ratios of profitability.

Table 3: Correlation matrix of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) and dividend payout ratio (DPR) of Berger Paints

	NP	RONW	ROCE	DPR
NP	1			
RONW	0.237109	1		
ROCE	0.315623	0.933629	1	
DPR	-0.10578	-0.69662	-0.6885	1

(Source: Calculated by author)

Table 3 shows the correlation between profitability and dividend payout ratio of Berger paints. There is positive correlation between net profit and return on net worth (RONW), return on capital employed and return on net worth (RONW), return on capital employed are positively correlated. There is negative correlation between dividend payout and the three ratios of profitability.

Table 4: Correlation matrix of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) and dividend payout ratio (DPR) of Akzo Nobel

	NP	RONW	ROCE	DPR
NP	1			
RONW	0.466021391	1		
ROCE	0.550711711	0.994429	1	
DPR	-0.531447042	0.211392	0.137051	1

(Source: Calculated by author)

Table 4 shows the correlation between profitability and dividend payout ratio of Akzo Nobel, Berger Paints. There is positive correlation between net profit and return on net worth (RONW), return on capital employed and return on net worth (RONW),

return on capital employed are positively correlated. There is negative correlation between dividend payout and the three ratios of profitability.

Table 5 shows that multiple correlation and multiple regression of dividend payout ratio on net profit (NP), return on net worth (RONW), return on capital employed (ROCE). The computed multiple correlation co-efficient is tested with the help of 'F' test and computed multiple regression coefficient is tested with the help of 'T' test. In this analysis, net profit (NP), return on net worth (RONW), return on capital employed (ROCE) are selected as independent variables and the dividend payout ratio (DPR) has been selected as dependent variable. The regression equation in this study is Regression equation $ROC = \beta_0 + \beta_1 \cdot NP + \beta_2 \cdot RONW + \beta_3 \cdot ROCE$. The correlation coefficient between DPR and factors of profitability i.e of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) of Asian Paints is statistically significant at 5% level of confidence. But coefficient of regression of DPR and factors of profitability i.e of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) of Asian Paints is statistically significant at 5% level of confidence.

Table 5: Multiple correlation and multiple regression

Multiple correlation and multiple regression of Dividend payout ratio on net profit (NP), return on net worth (RONW), return on capital employed (ROCE) [Regression equation $ROC = \beta_0 + \beta_1 \cdot NP + \beta_2 \cdot RONW + \beta_3 \cdot ROCE$]

company	R	R ²	F	β_0		β_1		β_2		β_3	
				value	t	value	t	value	t	value	t
Asian paints	0.95	0.90	18.63#	2.49	17.17***	0.05	-2.49**	0.65	-0.48	0.85	0.20
Kansai Nerolac	0.83	0.70	4.60	0.00	8.74***	0.20	1.44	0.75	0.33	0.47	-0.77
Berger Paints	0.71	0.51	2.04	0.01	3.89***	0.76	0.33	0.66	-0.46	0.67	-0.44
Akzo Nobel	0.75	0.56	2.52	0.42	0.87	0.54	-0.65	0.72	0.37	0.78	-0.29
# Significant at 5% level of table value (k,n-k-1) i.e (3,6) degree of freedom at 5% is 4.76				*Significant at 10% level ** Significant at 5% level *** Significant at 1% level Table values of t with (n-k-1) or 6 degree of freedom at 10%, 5% and 1% levels are 1.943, 2.447, 3.707 respectively.							

(Source: Calculated by author)

Conclusion:

It may be concluded that in case of all paint companies under consideration there is positive correlation between net profit and return on net worth (RONW), return on capital employed and return on net worth (RONW), return on capital employed are positively correlated. There is negative correlation between dividend payout and the three ratios of profitability. The correlation coefficient between DPR and factors of profitability i.e of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) of Asian Paints is statistically significant at 5% level of confidence. But coefficient of regression of DPR and factors of profitability i.e of net profit (NP), return on net worth (RONW), return on capital employed (ROCE) of Asian Paints is statistically significant at 5% level of confidence.

Limitations of the study

- The study is limited for a period 10 years from year 2008 to year 2017.
- The study has taken into consideration four paint companies in India viz, Asian paints, Kansai Nerolac, Berger Paints and Akzo Nobel have been selected on the basis of their market capitalization amounting more than Rs.5,000 crores as on 10.12.2017.
- The study has used limited numbers of statistical parameters.

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Interrelation of BITCOIN with Euro, Gold, Nifty, Crude oil and Ripple: A Causality Test

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Abstract

Crypto Currency have been fascinating avenue from its inception. Investors are sceptical about investment in crypto currency as there is no any legal body to support the system. People are therefore investing with imperfect information and joining the herd of speculators.

This paper intended to give fair picture of movement in BITCOIN and other investment avenues like Crude oil, Euro, Gold, Nifty and Ripple. This may help in understanding nature of risk and return in selected variables. To check causality of all selected variables last ten years weekly Closing Value of all the variables taken.

Correlation and causality test employed to check interrelation between these variables. Result of the study would help investors in analysing relation between selected investment avenues and BITCOIN.

Prelude

A world economy belaboring its way to marginal growth, and industrial production showing sluggish to incrementally better performance month by month. Markets too have reacted similarly and have gone down by around 6% from their record high hit in 2018. In such a situation, investors tend to get confused about how and where to invest. There was new optimism about the economy, industry, and business. Oil prices went down and inflation subsided.

Bitcoin has been criticized for the amounts of electricity consumed by mining. As of 2015, *The Economist* estimated that even if all miners used modern facilities, the combined electricity consumption would be 166.7 megawatts (1.46 terawatt-hours per year). At the end of 2017, the global Bitcoin mining activity was estimated to consume between 1 and 4 gigawatts of electricity (between 9 and 35 THz a year), with 1.2 GW as the theoretical lower bound assuming that everyone is using the most energy-efficient mining hardware available.

As published in economics times, 'One bit coin is currently worth Rs 544729 and this value has been extremely volatile and that is

one of the reasons why people are intrigued into investing in bit coins'

This paper is intended to see volatility and return of different investment avenue. Correlation between the variable will help in understanding relation between the variables. Depth of association checked by applying Granger causality test.

Literature Review

The literature review section is done to evaluate the concepts related to the topic of research. In order to gain a lot of information, various academic materials are consulted. The theories and models proposed by eminent scholars are taken into consideration for gaining a fruitful result. All these things are important at the time on conducting a research. Thus, in this paper a literature review will be done on the topic "Bitcoin, and other Investment avenues".

Katharina Krombhol (2016) found that about 46% of our participants use web-hosted solutions to manage at least some of their bitcoins, and about half of them use exclusively such solutions. Also, 22% of our participants have already lost money due to security breaches or self-induced errors. To get a deeper understanding, we conducted qualitative interviews to explain some of the observed phenomena.

Christin (2013) examined the track record of 40 Bitcoin exchanges established over the past three years, and find that 18 have since closed, with customer account balances often wiped out. Fraudsters are sometimes to blame, but not always.

Pavel Ciaian's (2015) conceptualised framework is based on the Barro (1979) model, from which we derive testable hypotheses. Using daily data for five years (2009–2015) and applying time-series analytical mechanisms, we find that market forces and BitCoin attractiveness for investors and users have a significant impact on BitCoin price but with variation over time.

Svetlana Sapuric (2014) studied and worked on substantiate with financial data collection and analysis the hypothesis regarding the volatility of Bitcoin exchange rate against common

currencies.

Research Methodology

Objectives

1. To compare different investment avenues and its return with bitcoin
2. To analyse how risky bitcoin is
3. To study if Bitcoin is a preferable investment avenue or not

Hypotheses

1. H1 : There is no relationship in price of bitcoin and price of gold
H2: There is relationship in price of bitcoin and price of gold
2. H1 : There is no relationship in price of bitcoin and price of Ripple
H2: There is relationship in price of bitcoin and price of Ripple

3. H1 : There is no relationship in price of bitcoin and price of Crude Oil

H2: There is relationship in price of bitcoin and price of Crude Oil

4. H1 : There is no relationship in price of bitcoin and price of euro

H2: There is relationship in price of bitcoin and price of euro

5. H1 : There is no relationship in price of bitcoin and price of Nifty

H2: There is relationship in price of bitcoin and price of Nifty

Research instrument/ tool for data analysis: Econometric tools used for the data analysis. ADF unit root test applied to check stationary of data. And then causality test applied to check causality between the variables.

Research software: E – View Student version [9] used for the analysis and conclusion drawn from the output of view.

Data Analysis and Interpretation
Table 1: Descriptive analysis of data

	BITCOIN	CRUDE_OIL	EURO	GOLD	NIFTY	RIPPLE
Mean	0.024347	-0.000674	-0.000399	-0.000653	0.001583	0.100576
Median	0.021150	0.000800	-0.000100	0.002000	0.002800	0.003100
Maximum	0.438200	0.122000	0.031200	0.067900	0.064800	3.400000
Minimum	-0.221600	-0.135400	-0.037900	-0.096400	-0.067900	-0.900000
Std. Dev.	0.093672	0.050669	0.013486	0.026203	0.019525	0.467829
Skewness	0.712854	-0.049824	-0.229888	-0.405317	-0.217139	3.659136
Kurtosis	5.670590	2.952053	3.199414	4.035259	3.892914	22.55155
Jarque-Bera	59.57050	0.079486	1.632545	11.23778	6.408305	2832.832
Probability	0.000000	0.961037	0.442076	0.003629	0.040593	0.000000
Sum	3.798100	-0.105200	-0.062300	-0.101800	0.247000	15.68980
Sum Sq. Dev.	1.360026	0.397938	0.028191	0.106419	0.059089	33.92393
Observations	156	156	156	156	156	156

Interpretation

This descriptive statistics have been done to see what status of measurement of different investment avenues is.

1. **BITCOIN:** Above table present descriptive statistics of Bitcoin. The result indicates that the mean value of Bitcoin return during the sample period is 0.024347 or 243.47% with low standard deviation of 0.093672 or 936.72%.
2. **CRUDE OIL:** Above table present descriptive statistics of crude oil. The result indicates that the mean value of Crude oil return during the sample period is -0.000674 with standard deviation of 0.050669
3. **EURO:** Above table present descriptive statistics of euro. The result indicates that the mean value of euro return during the sample period is -0.000399 with standard deviation of 0.013486
4. **GOLD:** Above table present descriptive statistics of Gold. The result indicates that the mean value of gold return during the sample period is 0.000653 with standard deviation of 0.026203

5. NIFTY: Above table present descriptive statistics of Nifty. The result indicates that the mean value of Nifty return during the sample period is 0.001583 with standard deviation of 0.019525

6. RIPPLE: Above table present descriptive statistics of Ripple. The result indicates that the mean value of Ripple return during the sample period is 0.100576 with low standard deviation of 0.467829

Table 2: Correlation between different investment avenues

	CRUDE_OIL	EURO	GOLD	NIFTY	BITCOIN	RIPPLE
CRUDE_OIL	1.000000	0.003864	0.086999	0.144012	-0.186625	-0.025302
EURO	0.003864	1.000000	0.111036	-0.162324	0.049673	-0.146940
GOLD	0.086999	0.111036	1.000000	-0.098812	0.080711	-0.004133
NIFTY	0.144012	-0.162324	-0.098812	1.000000	-0.095369	0.096917
BITCOIN	-0.186625	0.049673	0.080711	-0.095369	1.000000	-0.095353
RIPPLE	-0.025302	-0.146940	-0.004133	0.096917	-0.095353	1.000000

Interpretation

From Table 2 we can interpret that those who is having **1.00000** is having a **perfect Positive relationship**

- If we talk about **Euro** and **crude oil** then their correlation is **0.003864**, we can clearly say that they are having **weak positive uphill relationship**.
- If we talk about **Gold** and **crude oil** then their correlation is **0.086999**, we can clearly say that they are having **strong positive uphill relationship**.
- If we talk about **Bitcoin** and **Ripple** then their correlation is **-0.095353**, we can clearly say that they are having **strong downhill negative relationship**.
- If we talk about **Bitcoin** and **Euro** then their correlation is **0.49673**, we can clearly say that they are having **moderate uphill positive relationship**.

Unit root test

In statistics, a unit root test tests whether a time series variable is non-stationary and possesses a unit root. The null hypothesis is generally defined as the presence of a unit root and the alternative hypothesis is either stationarity, trend stationarity or explosive root depending on the test used.

All the variable series were non stationary in level but it becomes stationary in first difference.

Granger Causality Test

Table 3

Null Hypothesis	Observation	P-Value
BITCOIN doesn't granger Cause Crude oil	204	0.5425
Nifty doesn't granger Cause BITCOIN	204	0.4784
Ripple doesn't granger Cause BITCOIN	154	0.4559
GOLD doesn't granger Cause BITCOIN	204	0.1660
EURO doesn't granger Cause BITCOIN	204	0.6605

Interpretation

Bitcoin-crude oil

The objective of applying granger causality test was to verify and strengthen the inference made by co-relation co-efficient, granger causality test was run with the null hypothesis of BITCOIN and crude oil P-values for both F- statistics were found more than 0.05. This means that variable in question does not causes BITCOIN in other words there is no causes and effect relationship between BITCOIN and crude oil.

Gold – crude oil

Here in Gold and crude oil P value is less than 0.05 that is why Null hypothesis is rejected and gold causes granger causality therefore it appears granger causality runs one way and not the other way.

Gold – Bitcoin

Here in Gold and Bitcoin P value is less than 0.05 that is why Null hypothesis is rejected and Bitcoin causes granger causality therefore it appears granger causality runs one way, Gold causes granger causality bitcoin but bitcoin does not causes granger causality bitcoin as the P value is more than 0.05.

Ripple-Crude oil

Here in Ripple and crude oil P value is more than 0.05 that is why null hypothesis is accepted and ripple causes granger causality therefore it appears granger causality runs both way as other side is also having p value of more than 0.05

Conclusion

Investing in crypto currency carries very high risk as volatility on Crypto currency is highest. If we talk about latest developments in Crypto currency industry and its return against amount invested people are more of frightened as it has not been accepted by the Government of India and People's Republic of China whereas developed countries like USA and EUROPE are still accepting it and it has been gaining popularity like anything.

Acceptance level of Crypto currency was Medium before and now it has been officially announced by Hon'ble finance minister

of India that they may take action against such investors whereas developed countries are accepting it.

According to a research report from a digital forensics firm that studies the bitcoin block chain, Chain analysis, 3.79 million bitcoins are already gone for good based on a high estimate - and 2.78 million based on a low one. These points clearly show that bitcoins are risky investment options that should be traded with caution.

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The Impact of Sustainability Rating on Financial Performance of Selected Indian Companies

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Abstract

Sustainability value is the ability to grow in the long run by synthesizing with the natural, social and human capital. Globally there is a growing trend towards business providing economic, environment and social information into the public domain through sustainability reports. It also increases business performance through communication of information with shareholders. Sustainability has potential to influence company performance. This study is an attempt to examine the impact of sustainability rating of company on the financial performance of selected 13 Indian companies. The study also analyzes the separate impact of four key component of sustainability like community, employees, environment and governance on financial performance of company. The result indicates that the four components of sustainability Rating have significant and varying impact on financial performance and no significant association between overall sustainability ratings and financial performance of selected Indian Companies.

Key Words: Sustainable performance, Sustainable Rating

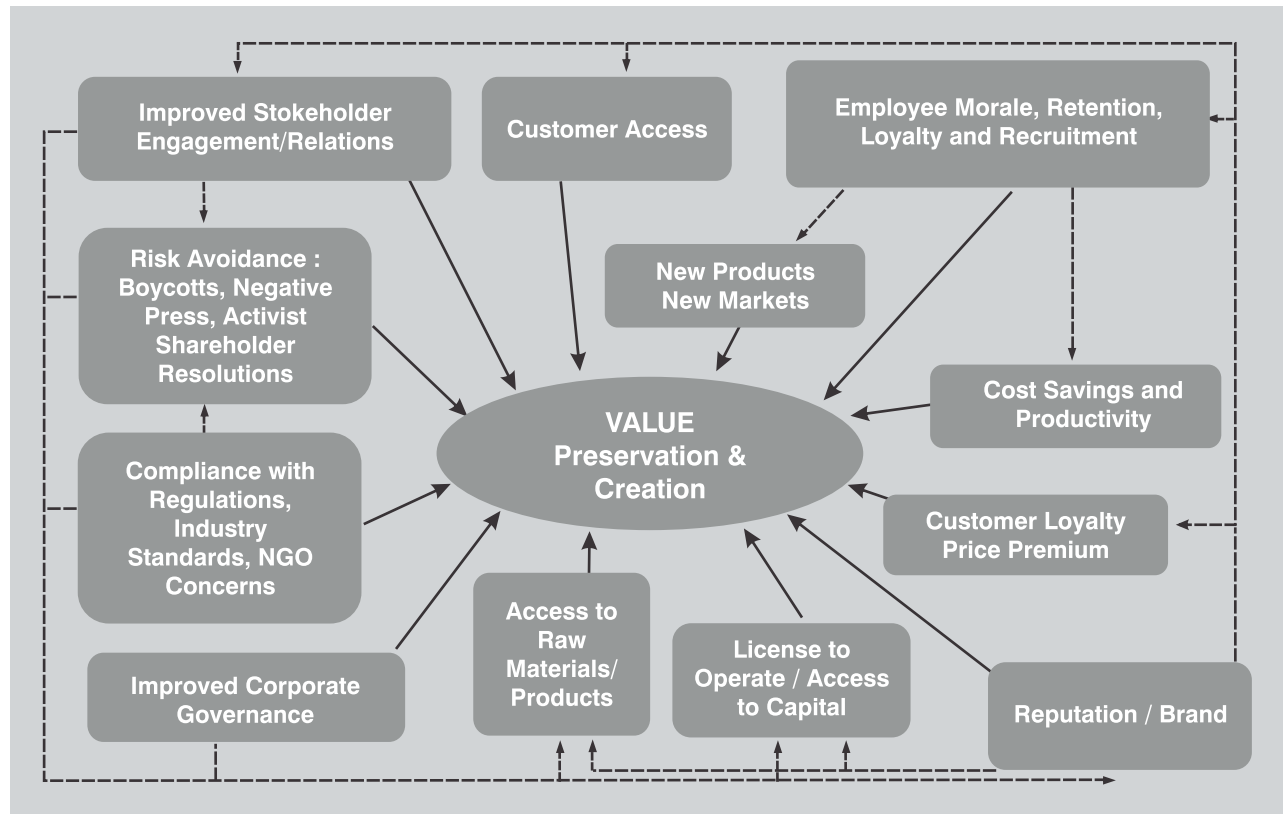
Introductions

Sustainable development has been defined under the Brundtland Report under the head Our Common Future. It stated "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs". The concept of corporate sustainability reporting is becoming popular in the today's business world. Companies are engaged in the corporate financial reporting practices in one or the other way so that the valuable information of the corporations whether it is quantitative or qualitative is disseminated to the various stakeholders. The corporate financial reporting is an old concept as compared to the corporate sustainability reporting. The emergence of information era in the last decade of the 20th century led business to operate in a challenging market place that is rapidly changing , evolving, complex, moving global, hypercompetitive and intensely stakeholder-focused.

Companies are drafting their strategies to encompass a larger picture to enhance competitiveness and also to ensure responsible and sustainable growth. But no company can gain sustainable competitive advantages by merely monitoring efficient allocation of tangible resources. Sustainability value is the ability to grow in long run by synthesizing with the natural, social and human capital which includes intangible assets like management skills, reputation, human and intellectual capital. Globally there is a growing trend towards business providing economics, environment and social information into the public domain through "Sustainability Reports". It also increases business performance through communication of information with shareholders. A key purpose of sustainability reporting is to assist organizations to identify the cross cutting dimension of triple bottom line performance and to understand the process of measuring, reporting and improving the business decisions which the organization can run into business.

Sustainability reporting helps organizations to measure the impacts they cause or experience, set goals and manage changes. It is the key platform for communicating sustainability performance and impacts whether positive or negative. A sustainability report is a report published by a company or organization about the economic, environmental and social impacts caused by its everyday activities. A sustainability report also demonstrates the link between its strategy and its commitment to a sustainable global economy. Global Reporting Initiative (GRI) is a leading organization in the sustainability field. GRI promotes the use of sustainability reporting as a way for organizations to become more sustainable and contribute to sustainable development. GRI Sustainability Reporting Guideline 2011 defined sustainability reporting as "the practice of publicizing a company's environmental and social risks, responsibilities, and opportunities". The GRI Sustainability Reporting Framework provides direction on how organisations can release their sustainability performance. Indian companies transitioned to the G3 Guidelines in 2007, all reports are based on the G3 Guidelines. It is widely believed and suggested by

researchers that in today's dynamic and complex business environment, the corporate sustainability is likely to influence corporate profitability and overall performance. These various benefits of corporate sustainability are shown below.



Source : Warren and Thomsen (2012)

Figure 1 : Benefits of corporate sustainability

Corporate Sustainability and its impact on financial performance have emerged as important areas for research in recent years. The purpose of this paper is to find whether sustainable companies are more profitable or not. Various studies were conducted for examining this relationship. The study analyzes the separate impact of four key component of sustainability like community, employees, environment and governance on financial performance of company.

Concept of Corporate Sustainability

As per the report by Mays (2003) 'Corporate Sustainability' means creating long-term shareholder value by embracing opportunities and managing risks arising from social, environmental and economic factors. The Mays Report also specified advantages of corporate sustainability. Sustainable behaviour adds value to commercial endeavour and makes for good business sense. It is specifically a helpful instrument to manage corporate image. It helps in assessing the capabilities and effectiveness of business administration and management. It leads to shift in the organizational focus from short-term to long-term goals. Transparency is an essential element of corporate sustainability. It can be assessed along various dimensions like: energy efficiency, community relations, eco design, materials efficiency, product recyclability, and employee relations. The four major components of corporate sustainability have been described in Table 1.

Table 1 : Components of corporate sustainability

Components	Description
1) COMMUNITY	The Community Component covers the company's commitment and effectiveness within local, national and global community in which it does business. It reflects company's citizenship, charitable giving and volunteerism. This component covers company's human rights record and treatment of its supply chain. It also covers the environmental and social impacts of company's products and services, and development of sustainable products, processes and technologies.
Human rights, supply chain, product quality & safety, product sustainability, community development, philanthropy.	
2) EMPLOYEES	The Employees Component includes disclosure of policies, programs, and performance in diversity, labor-relations and labor-rights, compensation, benefits, and employee training, health and safety. It focuses on compliance with national laws and regulations, fair treatment of all employees, disclosure of workforce diversity data, strong labor codes, comprehensive benefits, training and development opportunities, and employee health and safety policies.
Diversity, labor rights, treatment of unions, compensation, benefits, training, health, worker safety	
3) ENVIRONMENT	The Environment Component data covers company's interactions with the environment at large, including use of natural resources, and company's impact on Earth's ecosystems, compliance with environmental regulations, leadership in addressing climate change, energy-efficient operations, renewable energy, natural resource conservation, pollution prevention programs, strategy towards sustainable development and programs to engage stakeholders for environmental improvement.
Environmental policy, environmental reporting, waste management, resource management, energy use, climate change policies and performance.	
4) GOVERNANCE	The Governance Component covers disclosure of policies, procedures, board independence and diversity, executive compensation and evaluation of company's culture of ethical leadership and compliance. This component rates factors such as – alignment of corporate policies and practices with sustainability goals; transparency to stakeholders; integration of sustainability principles from top down into day-to-day operations of company. Governance focuses on how management is committed to sustainability and corporate responsibility at all levels.
Leadership ethics, board composition, executive compensation, transparency and reporting, and stakeholder treatment.	

Source: CSRHub (www.csrhub.com)

Related Theory

There are three major theories namely Legitimacy Theory, Stakeholder Theory and Agency Theory which suggest that companies should be sustainable and should incorporate corporate sustainability in their core strategic goals. The companies should disclose their sustainability performance in a proper sustainability report. These theories primarily suggest positive relationship between corporate sustainability and company performance. These theories are briefly shown in Figure 2.

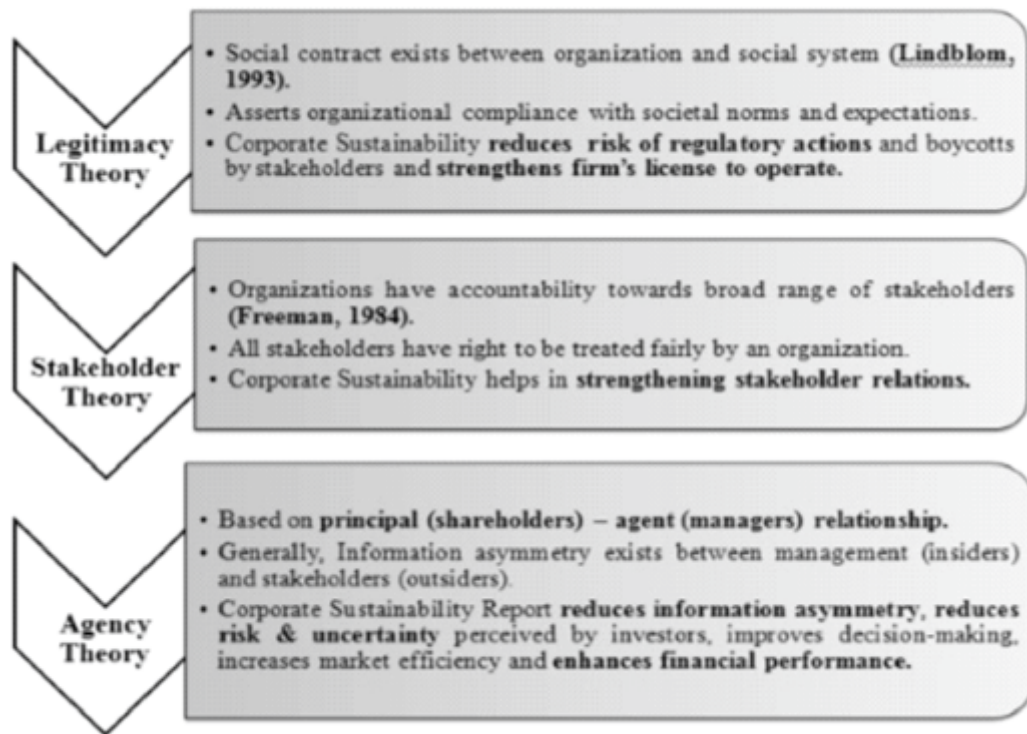


Figure 2 : Related theories

Literature Review

Ezejiolor (2016) analyzed the effect of sustainability accounting on the performance of corporate organizations in Nigerian and found that environmental cost does not impact positively on revenue of corporate organizations in Nigeria rather it impact positively on profit generation of corporate organizations. **Giridhari Sahoo (2015)** studied sustainability reporting practice in India and found that organizations were committed to sustainable development have to adopt a holistic approach and put in place systems to report environmental and other impact caused by their products and services. **Aarti Kadyan (2014)** investigated the impact of corporate environmental performance on its economic performance. The study found that environmental ratings have positive association with P/E ratio & ROA and negative relationship with EPS. However the relationship is not significant with any of the three variables.

Neeraj Goyal (2014) studied corporate Sustainability Reporting Practices among Indian Companies. The study concluded with that there is no specific framework for reporting as some items

have high disclosure and other items are ignored all together by companies while preparing reports and lot of variation in the disclosure score between various industries and some companies have high disclosure but other companies have very low disclosure index. **Ioannis Ioannou (2014)** examined the effect of mandatory sustainability reporting on corporate disclosure practices. The results highlight the role of local context and institutional differences in how firms in different countries respond to reporting regulations and the economic effect of the disclosure regulations appear to be positive and increased in disclosure because of the regulation reveals a positive correlation between instrumented disclosure and Tobin's Q. **Rashmi Ainapur (2014)** aims to investigating sustainability reporting practices followed by Indian founders. The study revealed that sustainability reporting is mandatory compliance for atop 100 listed Indian companies. **Priyanka Aggarwal (2013)** aims to explore whether sustainable companies are more profitable or not and also highlights that sustainability has potential to influence performance of company. The statistical result revealed that corporate sustainability as a whole had no significance influence

on financial performance and insignificant positive association between corporate sustainability and growth of firm. **Josheph Iwaro (2013)** examined the impact of sustainable building envelope design on building sustainability. The result shows that higher the average consumption of electricity is higher the sustainability performance of alternatives. **Sji Cyriao (2013)** examined the corporate sustainability reporting practice of top Indian and European companies. The study revealed that European companies have attended remarkable improvement in sustainability reporting practice whereas Indian companies need to improve their reporting. Raymond A. **Pradip Kumar Mitra (2009)** studied the development of Sustainability Reporting Practices in India with a significant amount of reporting activity. It concluded with a cost effective and high quality destination for developing some environment friendly and socially responsible practices. Indian corporate world can seize sustainability reporting as a business showcase and use it as great opportunity to demonstrate good governance and can carve out a special position in the Global Front.

Research Methodology

Research Objectives

Research objectives are as follows:

- To provide an overview of the concept of corporate sustainability and its various components.
- To present various related theories establishing relationship between corporate sustainability and financial performance.
- To provide literature review on the relationship between corporate sustainability and corporate financial performance.
- To empirically analyze the impact of overall sustainability rating of company on financial performance.
- To examine and analyze separately the impact of each of the four major components of sustainability i.e. Community, Employees, Environment and Governance on financial performance of company.

Study Period and Sample Size

The present study makes use of secondary data. The average data over a period of six years from FY 2009-2010 to FY 2015-16 has been used to enable cross sectional analysis. A series of statistical tools like multiple regression, correlation, t-test and F-test have been used to analyze the data and to investigate the impact of corporate sustainability on financial performance. Thus, the final sample comprises of 13 companies; listed on the NSE; which have continuously been included in NIFTY 50 Index

as on 31st March, 2015 with easily available financial and sustainability data, and which issue sustainability report as per GRI guidelines. The sample companies and the industry to which they belong are shown in Table 2.

Table 2: Sample description

No.	Sample Companies	Industry
1.	Reliance Industries Ltd.	Conglomerate
2.	Adani Enterprise Ltd.	Conglomerate
3.	Dabur India Ltd.	Conglomerate
4.	Bajaj Auto Ltd.	Automobile
5.	Mahindra & Mahindra Ltd.	Automobile
6.	Maruti Suzuki India Ltd.	Automobile
7.	Sun Pharmaceutical Industries Ltd.	Pharmaceutical
8.	Divi's Laboratories Ltd	Pharmaceutical
9.	Lupin Ltd.	Pharmaceutical
10.	Hindalco	Metal
11.	Jindal Steel & Power Ltd.	Metal
12.	TATA Steel	Metal
13.	TATA Chemical Ltd.	Chemical

Variable Description

Five Accounting-based measures namely Return on Assets (ROA), Return on Equity (ROE), Return on Capital Employed (ROCE), Profit before Tax (PBT), a growth variable- Growth in Total Assets (GTA) and Two market-based measures namely Tobin's Q (Q) and M/B Ratio have been used as proxies for financial performance. Accounting-based measures have been used because the audited accounting data is likely to be authentic and credible also not influenced by market perceptions or speculations. market-based measures have been used to identify effect of market fluctuations. Overall Sustainability Rating (OSR), Community Performance Rating (COM), Employees Performance Rating (ENV), Environmental Performance Rating (ENV) and Governance Performance Rating (GOV) have been used as proxies for sustainability performance of company.

Data Source

The financial data has been obtained from company's website,

audited financial statements and annual reports. Corporate sustainability, governance, community, employee and environment rating data have been obtained from "CSRHub database", which claims to be world's largest corporate sustainability rating database and principally adheres to GRI guidelines. Further, we controlled for size of firm because larger firms are likely to have higher profitability as they have greater resources for investing in profitable ventures. We use natural log of total assets as proxy for firm size.

Research Model

This research paper tests two different models using Multiple Regression Analysis as statistical tool in IBM SPSS Statistics software, in order to examine and analyze the relationship between corporate sustainability and financial performance. These models are described in the following section.

i) First Model

The first model intends to examine the impact of overall sustainability rating of company (independent variable - OSR) on the financial performance of firm (dependent variables – ROA, ROE, ROCE, PBT, GTA, Tobin's Q, M/B Ratio); while controlling for size of firm (SIZE). Five regression equations shall be tested in this model, which are as follows:

$$ROA = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (1)$$

$$ROE = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (2)$$

$$ROCE = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (3)$$

$$PBT = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (4)$$

$$GTA = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (5)$$

$$Q = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (6)$$

$$MB\ Ratio = \beta_0 + \beta_1.OSR + \beta_2.SIZE + \varepsilon \quad (7)$$

ii) Second Model

The second model aims at examining separately the impact of four major components of corporate sustainability (Community, Employees, Environment and Governance) on company's financial performance, while controlling for size of firm. The five regression equations to be tested in this model are as follows:

$$ROA = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (8)$$

$$ROE = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (9)$$

$$ROCE = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (10)$$

$$PBT = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (11)$$

$$GTA = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (12)$$

$$Q = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (13)$$

$$MB\ Ratio = c + b_1.COM + b_2.EMP + b_3.ENV + b_4.GOV + b_5.SIZE + \varepsilon \quad (14)$$

Data Analysis and Interpretation

The descriptive statistics for various variables used in this study have been shown in Table 3.

Table 3: Descriptive statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation	Coefficient of Variation
ROA	13	2.1893	24.0112	10.411926	7.8636905	75.5258009
ROE	13	2.1373	43.4585	17.414134	12.7095467	72.9840869
ROCE	13	0.0000	63.2440	22.073415	20.8433290	94.4272964
PBT	13	-908.53	153031.63	30893.40	40965.3531	132.602271
GTA	13	-1.1673	0.2045	-0.076432	0.3361786	-439.84012
OSR	13	43.0000	69.0000	55.846154	7.7335433	13.8479425
COM	13	38.0000	71.0000	52.692308	9.0864791	17.2444128
GOV	13	29.0000	59.0000	45.846154	9.7796230	21.3313924
EMP	13	55.0000	82.0000	63.230769	8.0224045	12.6875011
ENV	13	43.0000	78.0000	60.076923	11.8142678	19.6652345
LnTA	13	9.2210	14.0303	11.520662	1.3293167	11.5385444
Q	13	0.8859	44.5003	6.478990	11.6696197	180.114797
MBRatio	13	0.0009	5.1255	0.866791	1.3737448	158.486279

From Table 3 it is observed that mean value of OSR is 55.84% and the ratings for three components of sustainability are also more than 50% except GOV which is 45.84%. This implies that selected Indian companies should improved Governance Performance along with other along with other components to improve their sustainability performance rating. The coefficient of variation for EMP is 12.68% which is least among all the components followed by OSR. The coefficient of variation of Tobin's Q is highest which is 180.11 %, i.e. it is the least consistent variable and GTA is having least coefficient of variation which means it is having less fluctuation during the period under study. The results of first model regarding the impact of overall sustainability rating of financial performance of company have been summarized in Table 4 .

Table 4: Summarized Result of First Model

Particulars	R	R ²	Adjusted R ²	F	Significance of F	Regression Coefficient for OSR	p-value
ROA	0.369	0.136	-0.036	0.789	0.480	0.013	0.967
ROE	0.424	0.180	0.016	1.097	0.371	0.135	0.781
ROCE	0.426	0.182	0.018	1.110	0.367	0.209	0.781
PBT	0.766	0.587	0.504	7.100	0.012	1485.830	0.198
GTA	0.210	0.044	-0.147	0.186	0.799	0.008	0.561
Tobin's Q	0.334	0.112	-0.066	0.628	0.554	-0.303	0.516
M/B Ratio	0.710	0.504*	0.404	5.074	0.030	-0.495*	0.011

*indicates 5% level of significance.

From Table 4 it is observed that all p values are more than 0.05 except for MB Ratio. The dependent variable OSR has positive but insignificant impact on financial performance measure ROA, ROE, ROCE, PBT and GTA. The market based measure Tobin's Q has negative impact and MB Ratio is having negative but significant impact on OSR. PBT is the highest contributing variable. The results of second model regarding the impact of four components of sustainability on financial performance of company have been summarized in Table 5 .

Table 5: Summarized Result of Second Model

Particulars	ROA	ROE	ROCE	PBT	GTA	Tobin's Q	M/B Ratio
R	0.796	0.694	0.785	0.837	0.728	0.557	0.604
R ²	0.634	0.482	0.615	0.701	0.530	0.311	0.365
Adjusted R ²	0.372	0.112	0.341	0.487	0.194	-0.182	-0.088
F	2.422	1.303	2.241	3.279	1.579	0.631	0.806
Significance of F	0.140	0.361	0.161	0.077	0.281	0.684	0.580
Regression Coefficient for COM	0.483	0.505	0.138	-866.63	-0.010	1.505	0.214
Regression Coefficient for EMP	-0.661	-1.032	-2.246	-41.008	0.000	-0.796	-0.098
Regression Coefficient for ENV	-0.131	0.128	0.676	252.184	0.023	-0.275	-0.016
Regression Coefficient for GOV	0.265	0.353	0.895	2408.304	-0.013	-0.979	-0.140
p-value for COM	0.428	0.661	0.932	0.758	0.732	0.239	0.149
p-value for EMP	0.103	0.171	0.051	0.981	0.982	0.303	0.266
p-value for ENV	0.607	0.791	0.339	0.832	0.091	0.595	0.788
p-value for GOV	0.506	0.641	0.412	0.217	0.514	0.243	0.151

*indicates 5% level of significance.

Form Table 5 it is found that:

- Community related performance has positive insignificant relationship with companies financial performance measure except for PBT and GTA which have negative impact while market based measures have positive insignificant impact.
- Employee related performance has negative insignificant relationship with both financial and market based measures except for GTA which has no effect.
- Environment related performance has positive insignificant relationship with companies' financial performance except for ROA which has negative impact. Both market based measures have negative insignificant relationship with ENV.
- Governance related performance has insignificant positive relationship with companies' financial performance except for GTA which has negative impact. Both market based measures have negative insignificant relationship with GOV.

Conclusion

From the above analysis and interpretation of results, it is found that corporate sustainability has as a whole has no significant

influence on financial performance but market based measure, MB Ratio has significant negative effect on overall sustainability performance. Further corporate sustainability influences all the financial performance measures positively while market based measures negatively. Our result confirms to the findings of many existing researches which argue that corporate sustainability has no significant association with firm performance (Buys et al., 2011; Manescu, 2011). Further investigation of the impact of each component of sustainability separately on company's financial performance provides clearer results. We find that all components i.e., Community, Employees, Environment and Governance, have insignificant but varying association with financial performance. Further it is also found that community has positive influence on market based measures, Tobin's Q and MB Ratio while EMP, ENV and GOV dimension have negative influence on market based measures.

The present study also reveals insignificant positive association between corporate sustainability and growth of firm. This finding is in consonance with Kapoor and Sandhu (2010). This may be due to the reason that growth of a firm is dependent on other factors like product quality, price, marketing strategy, etc. apart

from sustainability activities performed by firm.

Limitations of Study

The present study is subject to certain limitations. Firstly, the sample size is small (i.e. 13 companies). Secondly, the study ignores control variables like age of firm, growth of firm, capital intensity, leverage, risk, R&D intensity, industry type etc. that may have significant influence on this relationship. The results of study should be interpreted in light of these limitations and the future researchers should attempt to overcome them while doing further research in this area.

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Determinant of Foreign Exchange Rate: An Empirical Study

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Abstract

The value of a currency depends on various that affect the economy such as imports and exports, inflation, employment, interest rates, growth rate, trade deficit, performance of equity markets, macroeconomic policies, commodity prices and geopolitical conditions. The study reviews the relevant factors and applied multiple regression analysis to determine the most significant variables those theoretically affect foreign exchange rates. Findings of the study indicated that government debt and unemployment rate are significant predictors of the INR/USD Exchange rate. Further, the correlation between the Gold and Crude with INR/USD Exchange rate was checked. As per the findings, there gold and the exchange rate were correlated.

Keywords: Rupee Volatility, Exchange Rate, Inflation, Economy, Government Debt

JEL Classification: E50, F31, F40

Introduction

Currency fluctuations are a natural outcome of the floating exchange rate system that is the norm for most major economies. Exchange rate of one currency versus the other is influenced by numerous fundamental and technical factors including relative supply and demand of the two currencies, economic performance, outlook for inflation, interest rate differentials, capital flows etc (Singh et al, 2016). In 1947, post-independence, one US \$ was equal to one Indian rupee and there were no foreign borrowings. After the introduction of Five year plan in 1951, Indian Government started foreign borrowings to finance welfare and development activities and the exchange rate was 1 US\$ = Rs. 4.8 (Narang, 2014).

Following, a series of economic reforms since the early nineties, exchange rate regime shifted from fixed to flexible exchange rate. The Forex rates are determined by market forces and are based on demand and supply of these currencies. If supply exceeds the demand, the value of the currency depreciates (Grewal, 2013).

The Indian rupee, which was at par with US dollar at the time of

independence in 1947, hit a record low of 66.10 against the dollar recently (20/4/18). This means the Indian currency has depreciated by almost 66 times against the greenback in the past 71 years. Moreover, the major depreciation of Indian rupee against US dollar happened in the year 2013 when rupee touched a record low of Rs. 68.7 amid fear that the US will scale back stimulus measures. Thus, Indian rupee has seen many ups and downs over a period of time. This study is an attempt to look at this volatility quantitatively. Section I of the study identifies the independent factors that influence the value of Indian rupee through regression analysis. Section II checks the correlation of Indian Rupees with Gold and Crude prices.

Literature Review

The subject of rupee volatility is as old as our independence. Therefore, the study analysing the macroeconomic factors affecting rupee volatility is not one of its kind. There are many scholars who have attempted to evaluate those factors in the past. Few of the relevant studies have been reviewed as under.

There are many conceptual studies addressing the causes of rupee fluctuations and its impact on Indian economy. In a conceptual study, Grewal (2013) analyzed various factors that resulted into Rupee – dollar fluctuations and its impact on India economy. As per findings, a lot depends on the Global economic outlook and future of Eurozone which will determine future of rupee. As per the researcher, various steps adopted by Central bank can reverse the situation but it will last for short term only. Similar to this study, Soni and Parashe (2012) concluded that India should focus on enhancing capacity in manufacturing, promote entrepreneurship and provide incentive for innovations. Innovation driven economy can create unique value of India at global level. Kulkarni and Joshi (2016) also attempted to analyse the analysed causes for rupee fluctuation and opined that government should take steps to improve capital inflow in the form of Foreign Direct investment and foreign institutional investors. Overall development of economy will result into appreciation of rupee. Kanojia¹ and Dhamija (2017) studied

trends in Indian Rupee-US Dollar Rate and concluded that Foreign exchange reserves in India and RBI net purchases of dollars can be useful tools of exchange rate management and Market demand and supply forces in commodity and financial markets together, largely influence rupee-dollar spot rate.

Apart from the conceptual studies, there are few studies applying economic theories and building models to identify the factors influencing the value of rupee. One such study was conducted by Bansal et al (2013). By applying the regression model, the authors found that unemployment rate ratio, interest rate ratio, inflation rate ratio, budget balance ratio, government debt /GDP ratio and government bond yield ratio are the most significant variables in determining the INR-USD exchanges. The present study has used these variables to predict the value of Indian Rupee. In one more specific study, Hidayathulla and Rafee (2014) analysed the relationship between Crude oil price and rupee- dollar Exchange rates. They suggested that oil supply augmentation and control over oil demand seems to be viable policy option to overcome exchange rate depreciation and its consequences. Paul (n.d.) applied multiple regression and found that interest rates, Sensex, trade balance and the current account balance significantly influence the exchange rate while capital account balance and inflation rate were not so significant in affecting the exchange rate.

In the context of the above mentioned studies, it may be seen that the present study extends the extant literature for determinants affecting the exchange rate. It takes in to consideration the relevant macroeconomic factors with a different time frame to arrive at the predictors of exchange rate.

Research Objectives

Following objectives were set for the research.

1. To understand the relationship of various macro-economic factors with the Rupee-Dollar exchange rate.
2. To statistically evaluate the macro economic factors with the Rupee-Dollar exchange rate.
3. To test the relationship of Rupee-Dollar exchange rates with absolute Gold and Crude Prices measured in domestic currency.

Research Methodology

The study based on the secondary data is divided into parts, the methodology of the same is discussed below.

Table 1: Research Methodology Outline

Parameters	Determinant of Exchange Rate	Correlation of Gold and Crude with Exchange Rate
Research Design	Descriptive	
Sub-Type of Research Design	Single Cross Sectional	
Nature of Study	Quantitative	
Sampling Procedure	Non-Probability	
Sampling Technique	Judgmental	
Sample Size (Cells)	162	54
Sampling Duration	2000 to 2017 (18 Years Data)	
Type of Scale	Non-Comparative	
Scale Measurements	Ratio	
Sources of Data Collection	Secondary Data	
Sources of Secondary Data	Websites	
Tools for Secondary Data Collection	Internet	
Data Processing and Management	SPSS and Excel	
Test Statistics	Durbin Watson Test, VIF Factor & Multiple Regression	Spearman's Rho

(Source: Authors' Compilation)

With respect to the macro factors nine factors were chosen after conceptually understanding the efficacy of the same. As the currency exchange rate (INR/USD) (i.e Indian Rupee/ US Dollar) is a ratio, all the nine variables that were included in the study were also converted into ratios for attaining the appropriate regression model and also to ensure the standardization of the data in one particular unit. The nine factors include the INR/USD, DowJones/Sensex, US Unemployment Rate/IND Unemployment Rate, US Balance of Trade/IND Balance of Trade, US CPI/INDCPI, US GDP/IND GDP, US Interest Rate/IND Interest Rate, US Budget Balance/ IND Budget Balance and US Government Debt/IND (i.e India) Government Debt. The INR/USD is treated as a dependent variable and rest of the eight factors are treated as independent variables. The absolute values of gold and crude measured in Indian Rupees were taken to test the correlation with the Exchange rate of USD/INR.

The Durbin Watson statistic should be between 1.5 and 2.5 which suggests that the data is not auto-correlated. Auto-correlation of the data provides improper regression results. Thus, when the auto-correlation is not found, it is safe to proceed with the regression model. The other method to check-out the multicollinearity is using Variance Inflation Factor (VIF). Tolerance is a measure of collinearity. A small tolerance value indicates that the variable under consideration is almost a perfect linear combination of the independent variables already in the equation and that it should not be added to the regression equation. The Variance Inflation Factor (VIF) is 1/Tolerance, it is always greater than or equal to 1. Values of VIF that exceed 10 are often regarded as indicating multicollinearity, but in weaker models values above 2.5 may be a cause for concern (Research Consultation, n.d.). R-square is simply the percentage of variance in the dependent variable explained by the collection of independent variables. It provides an indication of the explanatory power of the regression model.

Macroeconomic Factors and Rupee Volatility

The factors affecting the foreign exchange rate are discussed below:

Table 2: Relationship and Effect of Macroeconomic factors with/on Indian Rupee

Factors	Explanation	Relationship	Effect
Inflation Rate	Inflation refers to the prices. A country which has lower inflation, exhibits a rising currency value, while a country with a higher inflation, witnesses depreciation in its currency.	Inflation ↑ ↔Currency Depreciates Inflation ↓ ↔ Currency Appreciates	Indirect
Interest Rate	Higher interest rates provide higher return to investors, so more amount of foreign capital could be easily attracted. If the interest rate is high the currency appreciates and vice-versa.	Interest Rate ↑ ↔Currency Appreciates Interest Rate ↓ ↔ Currency Depreciates	Direct
Current Account Deficit/ Balance of Payments (BOP)	When the imports are more than the exports, it leads to deficiency in the Balance of the Payments, leading to depreciation of currency and vice-versa.	BOP ↑ ↔Currency Depreciates BOP ↓ ↔ Currency Appreciates	Indirect
Government Debt	A country which has government debt is less likely to acquire foreign capital, leading to inflation. So, there will be decrease in the value of the exchange rate.	Debt ↑ ↔Currency Depreciates Debt ↓ ↔ Currency Appreciates	Indirect
Terms of Trade	It is the ratio of export prices to import prices. If export prices are higher than the import prices, the demand for country's currency rises and the currency appreciates and vice-versa.	Export Prices ↑ ↔Currency Appreciates Export Prices ↓ ↔ Currency Depreciates	Direct
Capital Market	If the capital market is performing well, it attracts Foreign Institutional Investors (FIIs). Increase in foreign capital, in turn, leads to an appreciation in the value of its domestic currency. In a reverse situation, FIIs withdraw their funds from the Indian capital market and the value of the domestic currency depreciates.	Capital Market ↑ ↔Currency Appreciates Capital Market ↓ ↔ Currency Depreciates	Direct

Unemployment Rate	High rate of unemployment indicates economy is not doing well and to protect against bad times investors invest in gold and the value of home currency depreciates.	Unemployment ↑ ↔ Currency Depreciates Unemployment ↓ ↔ Currency Appreciates	Indirect
GDP	Higher GDP would cause central bank to raise interest rate for stabilization. The high interest rate then attracts inflow of foreign currency which seeks for higher return in the international market. This would cause the home currency to appreciate.	GDP ↑ ↔ Currency Appreciates GDP ↓ ↔ Currency Depreciates	Indirect
Commodity (Gold, Crude Oil, Precious Metals)	Usually the transaction of commodities like gold, oil, precious metals etc, is done in US Dollars. As the local currency is sold in the international markets to gain dollars, there is an excess of local currency in circulation. Thus due to an excess of supply and lowered demand, the local currency is devalued.	Demand of Commodity ↑ ↔ Currency Depreciates Demand of Commodity ↓ ↔ Currency Appreciates	Indirect

(Source: Compiled by the Authors)

Section I: Exchange Rate Vs. Macro Factors

A regression analysis was run on the factors, to develop the regression model. Initially Enter Method was deployed to come out with the regression model. The enter method showcased the R-Square value of 79%, with Durbin Watson value of 2.023 and unfortunately VIF value was greater than 10 in many cases. So, the Enter method was discarded and Step-Wise method of Regression was adopted. The results of Regression are depicted in Table 3.

Table 3: Variables Summary Post Regression Run

Model 1		Model 2	
Dependent Variable	INR/USD Exchange Rate	Dependent Variable	INR/USD Exchange Rate
Variables Entered	Variables Removed	Variables Entered	Variables Removed
US Government Debt / IND Government Debt	Dow Jones/Sensex, US Unemployment Rate / IND Unemployment Rate, US Balance of Trade/IND Balance of Trade, US CPI/INDCPI, US GDP/IND GDP, US Interest Rate / IND Interest Rate, US Budget Balance / IND Budget Balance	US Government Debt/IND Government Debt and US Unemployment Rate / IND Unemployment Rate	Dow Jones / Sensex, US Balance of Trade/IND Balance of Trade, US CPI / INDCPI, US GDP / IND GDP, US Interest Rate/IND Interest Rate, US Budget Balance / IND Budget Balance

(Source: SPSS Output)

H_{0i} : None of the independent variables are significant predictors of the dependent.

H_{1i} : At least one of the independent variable is a significant predictor of the dependent.

Table 4: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson	Multicollinearity Statistics	
						Tolerance	VIF
1	0.530	0.281	0.236	0.003	0.000	1.000	1.000
2	0.811	0.657	0.612	0.002	1.286	0.657	1.521

(Source: SPSS Output)

For Model 1

The Durbin Watson statistics is not available (0.000). The VIF value was in the range of 1 to 10, so it could be concluded that there is no

multicollinearity symptoms. The explanatory power of the equation was just 28%, so the second model as per the Step-wise regression was evaluated.

For Model 2

The Durbin Watson statistics noticed was 1.286, which is between 1.5 and 2.5 and it also suggests that the data is not auto-correlated. The VIF value was noted as 1.521, which is in the range of 1 to 10, so it could be concluded that there is no multicollinearity symptoms. Moreover, the explanatory power of the equation was noted at 65%.

Table 5: ANOVA

Particulars	Sum of Squares	df	Mean Square	F	Sig.
Regression	0	2	0	14.389	0.000
Residual	0	15	0		
Total	0	17			

(Source: SPSS Output)

From Table 5, it may be seen that the Sig. P-value is less than 0.00, so the Null Hypothesis is rejected. In other words, at least one of the independent variable is a significant predictor of the dependent.

Table 6: Coefficients

Particulars	Unstand- ardized Coefficients	Std. Error	Standard- ized Coefficients	t	Sig.
	B		Beta		
(Constant)	0.021	0.002		10.103	0.000
Government Debt USA/India Government Debt	-0.011	0.002	-0.973	-5.22	0.000
US Unemployment Rate/IND Unemployment Rate	0.005	0.001	0.756	4.057	0.001

(Source: SPSS Output)

H₀₂: USD Government Debt/IND Government Debt and US Unemployment Rate/IND Unemployment Rate is not a significant predictors of the INR/USD Exchange rate.

H₁₂: USD Government Debt/IND Government Debt and US Unemployment Rate/IND Unemployment Rate is a significant predictors of the INR/USD Exchange rate.

From Table 6, it may be seen that the P-value for USD Government

Debt/IND Government Debt is $0.000 < 0.05$ and the P-value of US Unemployment Rate / IND Unemployment Rate $0.001 < 0.005$. Thus, it could be understood that US Government Debt / IND Government Debt and US Unemployment Rate / IND Unemployment Rate are significant predictors of the INR/USD Exchange rate.

Thus, the Regression Equation formed is as follows:

$$\text{INR/USD Exchange Rate} = 0.21 - (0.011 \times \text{Government Debt USA/India Government India}) + (0.005 \times \text{US Unemployment Rate/IND Unemployment Rate}).$$

Section-II Exchange Rate Vs. Gold, Crude

The correlation was tested between the gold, crude and exchange rate with the following null hypothesis.

H₀₃: Gold is not correlated with the Exchange rate. H₁₃: Gold is correlated with the Exchange rate. H₀₄: Crude is not correlated with the Exchange rate. H₁₄: Crude is correlated with the Exchange rate.

Table 7: Test Statistics for Spearman's Rho

Particulars	Gold	Crude
Spearman's Rho	0.616	0.340
Sig. (2-tailed)	0.006	0.168
N	18	18

(Source: SPSS Output)

It may be inferred that the Sig. P-value for gold is $0.00 < 0.01$, so H₀₃ is rejected i.e. there is a correlation between gold and exchange rate. In other words when the exchange rate increases the prices of gold also rise, because gold being an import commodity in India, needs to be settled in US Dollars. So, more rupees are to be spent to buy dollars to pay the import bill of gold. It may be inferred that the Sig. P-value for Crude is $0.16 > 0.01$, so H₀₄ is not rejected i.e. there is no correlation between crude and exchange rate.

Conclusion

The study in general explains the impact of macroeconomic factors such as balance of payment, inflation rate, interest rate, unemployment, commodity prices, capital market etc; and their relationship and impact on Indian Currency. As per the output of Regression model, there are two factors that can predict the exchange rate i.e. USA Government Debt / Indian Government Debt and USA Unemployment Rate/India Unemployment Rate. The findings of the earlier studies may vary in relation to present study due to different time frames taken for the analysis.

The study would be useful to the investors who are either involved in trading or hedging of INR/USD. They may take this study as a base to improve their predictions. However, it is to be noted by the investors that this model is based upon the data set of macroeconomic factors for previous 17 years and the future can be uncertain and vary from the past results.

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Measuring the Role of Self Help Groups in Promoting Financial Inclusion in Selected Cities of Saurashtra Region



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Abstract

Financial Inclusion is one of the key agenda of the Government during five year planning. Financial Inclusion was widely covered in eleventh five year plan (2007-2012), which focused on the goal of inclusive growth and inclusion of the financial sector to achieve it. Many policy initiatives were undertaken by the government to foster the inclusion of the excluded people from the financial ambit. Such initiatives included no frills accounts, issue of General Credit Cards and Kisan Credit Cards, etc. Out of them one of the key initiative of the government was creation of linkage of banking with the Self Help Groups through account opening and even providing micro credit. This paper aims to analyze the role of such Self Help Groups in fostering Financial Inclusion in the target area and to test it statistically with paired t test and chi-square.

Key Words

Financial Inclusion, Formal Credit, Self Help Groups (SHG)

Introduction

Financial inclusion can be defined as addition of the group of people who are excluded or are not included in the ambit of formal financial services like core banking activities of depositing money, availing credit, access to cheques/debit card, etc. Not only banking services, they are also not covered with insurance or any other financial service. In order to foster the inclusion, Government of India and RBI has taken several measures and initiatives to promote it and develop it up to an extent of 100% coverage of all households, whether rural or urban in the formal financial sector. Out of such initiatives, one of the widely accepted and implemented initiatives is linking formal banking services with Self Help Groups.

Introduction to Self Help Groups

As a part of promotion of Financial Inclusion, NABARD took the first initiative way back in 1992 to launch Self Help Groups Bank Linkage Programme which helped in the extension of financial services to poor as well as rural households, where there was

limited outreach of the formal financial sector.

A Self Help Group can be understood as a group or team majorly of 8 to 10 members forming a group who generally belong to the same social and economical background. The aim of the SHG is to develop a savings habit in the group members, who contribute an equal sum every month and deposit it into their bank account. The groups are majorly formed with an objective of carrying out any economic activity, which help the group members to earn a livelihood and also to save a fixed amount at the end of every period which will be disbursed to the members as and when needed, in the form of credit.

As on March 2011, NABARD had provided Rs. 25.45 billions to banks covering their lending to SHGs. Around 4.82 million SHGs received loans from banks with an outstanding amount of Rs 306.27 billion while 7.54 million SHGs had been linked to the banking system.

The Union Budget 2011-2012 had proposed to set up a "Women's SHG's Development Fund" with a corpus of Rs. 500 crore. The Government of India created this fund to empower women and promote their SHGs and it is operated by NABARD through its two major microfinance funds- Financial Inclusion Fund (FIF) and the Financial Inclusion Technology Fund (FITF).

Self Help Groups and Role of Mission Mangalam in Gujarat

On the occasion of the Golden Jubilee Year celebration of Gujarat State, Former Chief Minister Mr Narendra Modi launched a drive by the name MISSION MANGALAM with an objective to organize the poor into Self Help Groups/ other organizations of the poor, link them with banks build capacities in them and lead them towards sustainable livelihoods.

To implement this Mission a company was formed in April 2010 by the name Gujarat Livelihood Promotion Company Limited (GLPC) and a budgetary provision of Rs. 95 Crores was made for 2010-11 for Mission Mangalam. The manpower for the GLPC was approved on 4th September, 2010. Simultaneously, in 2010 the Ministry of Rural Development, Govt. of India launched the National Rural Livelihoods Mission (NRLM) replacing the existing

Swarnajayanti Gram Swarozgar Yojana (SGSY) implemented since 1998.

NRLM was formed with an objective to organize the poor households into SHGs, develop them by providing requisite training and capacities and then link them with bank and micro credit and thus foster their livelihoods. Under NRLM, every State is required to form its own State Livelihood Mission and a dedicated structure to implement the mission at the state level. Mission Mangalam is the State Livelihood Mission for Gujarat and GLPC is its implementing agency.

Objectives of the Study

Primary Objective:

1. To identify the role of Self Help Groups in fostering Financial Inclusion among rural households in selected cities.

Secondary Objectives:

2. To analyze the frequency of Savings, Bank visits and access to formal credit, (core financial inclusion parameters) pre and post joining of a household in SHG.
3. To analyze the association of SHG membership on Financial Inclusion by calculating Financial Score

Review of Literature

Chavan P, Birajdar B (2009), studied Importance of micro finance as a important mean of financial inclusion in India. Micro finance is providing the rural and poor households with micro credit, which help them to cope up with certain situations like children education/marriage, health concerns, etc.

S. Porkodi, Dr. Aravazhi D. (2013) studied the achievement and challenges of Micro finance institutions and Self Help Groups in providing credit to the households. The major challenges were lack of financial literacy and knowledge of financial products and services.

Kharuri H. Z., Manjunatha T. (2016) concluded that SHGs and linking their savings account to bank through financial inclusion has made drastic changes in the life of rural people and even on their standard of living.

Dr.M.Lakshmana Kumar (2017) studied remarkable improvement in households after joining Self-Help Groups in four out of seven variables governing self-worth: Savings Bank Account, Income Level, Recognition in the Family, Bank Loan Availed.

Rathore R, Garg M (2013) analyzed that SHGs contribute to solving the problems of inadequate housing and urban services as an integral part of poverty alleviation programmes.

K.Somasekhar (2015) studied SHGs play a significant role by developing thrift habit and providing credit as and when required. He also examined the performance of SHGs, Bank Linkage for financial inclusion and rural livelihoods

Research Methodology

This study is descriptive in nature and primary data is collected with the help of structured questionnaire. The sampling technique used is convenience sampling and the sample size is women respondents who are currently the members of Self Help Groups. The respondents belonged to Junagadh, Rajkot, Jamnagar and Amreli. From each of the cities a sample of 100 respondents was analyzed. Data collected was analyzed with the help of SPSS and the data is analyzed with the help of statistical tools like t test, Chi-square and Frequency Analysis.

Data Analysis

Table 1: Frequency Analysis of Demographic Variables of Respondents

Age					
Age	Junagadh	Rajkot	Jamnagar	Amreli	Total
18-25	2	11	3	1	17
26-35	26	45	39	40	150
36-45	43	44	32	48	167
>45	29	9	31	14	83
Total	100	109	105	103	417
Education					
Education	Junagadh	Rajkot	Jamnagar	Amreli	Total
Illiterate	5	3	8	14	30
Literate	40	18	3	45	106
Up-to Primary	41	54	70	44	209
Up-to secondary	7	31	8	0	46
Graduate	7	3	16	0	26
Total	100	109	105	103	417

(Source: Primary data)

Table 2: Calculation of Financial Inclusion Score, To Measure the Degree of Financial Inclusion

Parameter	Source	Yes	No
Nature & Access of Formal Financial Services	Did you had a Bank Account Before joining a Self Help Group	20	0
Extent of Financial Services	What is the frequency of your visit to a Bank Branch?	20	0
Savings	Do you save? (Before Joining a Self Help Group)	20	0
Formal credit	Have you availed a Bank Loan / Formal Credit before joining a Self Help Group?	20	0
Usage of Financial Services	Did you had an Insurance before joining a Self Help Group?	10	0
Usage of Financial Services	Did you had an ATM/Debit card before joining a Self Help Group?	10	0
Total		100	

(Source: Primary data)

The index varies between “0 and 100”.

- Value “100” implies full Financial Inclusion of the households and
- Value “0” implies complete Financial Exclusion of the household.
- Value of “1-29” implies low financial inclusion,
- value of “30-60” implies medium financial inclusion and
- “61-99” implies high level financial inclusion

(Reference: Self Help Groups & Financial Inclusion – A Case Study in Baksa District of Assam – Rahul Sarania & Dr. Shrabanti Maity, Published in International Journal of Humanities & Social Science Studies)

Table 3: FI Score & Chi-Square Analysis

Junagadh_FI Score						
Category Of Respondents	0 (Excluded)	Less Than 30 (Low Level Of FI)	31 To 60 (Medium Level Of FI)	More Than 60 (High Level Of FI)	100 (Completely Included)	Total
Pre	67	8	25	0	0	100
Post	0	0	15	81	4	100
Total	67	8	40	81	4	200
Rajkot_FI Score						
Category Of Respondents	0 (Excluded)	Less Than 30 (Low Level Of FI)	31 To 60 (Medium Level Of FI)	More Than 60 (High Level Of FI)	100 (Completely Included)	Total
Pre	93	10	7	0	0	110
Post	0	0	46	60	4	110
Total	93	10	53	60	4	220
Amreli_FI Score						
Category Of Respondents	0 (Excluded)	Less Than 30 (Low Level Of FI)	31 To 60 (Medium Level Of FI)	More Than 60 (High Level Of FI)	100 (Completely Included)	Total
Pre	79	14	10	0	0	103

Post	0	0	15	83	5	103
Total	79	14	25	83	5	206
Jamnagar_ FI Score						
Category Of Respondents	0 (Excluded)	Less Than 30 (Low Level Of FI)	31 To 60 (Medium Level Of FI)	More Than 60 (High Level Of FI)	100 (Completely Included)	Total
Pre	66	4	19	16	0	105
Post	0	0	39	61	5	105
Total	66	4	58	77	7	212

(Source: Primary data)

H₀: There is no association between Degree of Financial Inclusion & Membership in a Self Help Group

H₁: There is an association between Degree of Financial Inclusion & Membership in a Self Help Group.

At 0.05 level of significance,

Table 4: Chi-Square results (Based on Manual Calculations)

District	Theoretical / calculated value		Critical value	Decision
Junagadh	222.15	>	9.488	H ₀ not accepted
Rajkot	195.7	>	9.488	H ₀ not accepted
Jamnagar	104.57	>	9.488	H ₀ not accepted
Amreli	182	>	9.488	H ₀ not accepted

(Source: Primary data)

Table 4: Chi-Square results (Based on significant p values, at 0.05 level of significance)

District	Corresponding p values		Level of significance	Decision
Junagadh	0.00001	>	0.05	H ₀ not accepted
Rajkot	0.00001	>	0.05	H ₀ not accepted
Jamnagar	0.00001	>	0.05	H ₀ not accepted
Amreli	0.00001	>	0.05	H ₀ not accepted

(Source: Primary data)

This means that we reject the null hypothesis & accept the alternate hypothesis that there is a significant association between Degree of Financial Inclusion & Membership in a Self Help Group

Paired Sample t test

Here, analysis of mean difference with respect to the respondents before and after joining Self Help Groups is done.

H₀: There is no significant difference between the mean values of the two variables,

- Frequency of Bank visits
- Savings behavior
- credit/loan availed by the respondents of Junagadh, Rajkot, Jamnagar & Amreli

Before joining SHG and after joining SHG

H₁: There is a significant difference between the mean values of the two variables,

- Frequency of Bank visits
- Savings behavior
- credit/loan availed by the respondents of Junagadh, Rajkot, Jamnagar & Amreli

Table 5: Results of Paired Sample t test

JUNAGADH_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	BANK VISIT - BANK VISIT	1.686	1.476	.144	1.400	1.971	11.701	104	.000
Pair 2	PRE_SAVINGS - POST SAVINGS	.648	.480	.047	.555	.741	13.825	104	.000
Pair 3	PRE_LOAN -POST_LOAN	.467	.538	.053	.362	.571	8.884	104	.000

RAJKOT_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	BANK VISIT - BANK VISIT	2.468	.908	.087	2.295	2.640	28.361	108	.000
Pair 2	PRE_SAVINGS - POST SAVINGS	.945	.229	.022	.901	.988	43.058	108	.000
Pair 3	PRE_LOAN -POST_LOAN	.569	.498	.048	.474	.663	11.936	108	.000
JAMNAGAR_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	BANK VISIT - BANK VISIT	1.686	1.476	.144	1.400	1.971	11.701	104	.000
Pair 2	PRE_SAVINGS - POST SAVINGS	.648	.480	.047	.555	.741	13.825	104	.000
Pair 3	PRE_LOAN -POST_LOAN	.467	.538	.053	.362	.571	8.884	104	.000
AMRELI_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	BANK VISIT - BANK VISIT	2.728	.629	.062	2.605	2.851	44.001	102	.000
Pair 2	PRE_SAVINGS - POST SAVINGS	.903	.298	.029	.845	.961	30.799	102	.000
Pair 3	PRE_LOAN -POST_LOAN	.709	.457	.045	.620	.798	15.754	102	.000

(Source: Primary data)

Results of the above analysis indicate that, the null hypothesis is rejected at 5% level of significance, and hence we can conclude that there is statistically significant difference between the mean values of the 2 variables, before and after joining SHG, is accepted for all above four regions.

Conclusion

From the above results, we can conclude that, Self Help Groups proves to be one of the most successful initiatives by the government which contributed towards the successful implementation of financial inclusion drive in Gujarat. Due to SHGs, women who are highly excluded from the formal financial services got an opportunity to get the inclusion in financial products and services. Additionally the beneficiaries got the chance to develop themselves economically and get social recognition. Hence Self Help Groups are the key contributors in making financial inclusion successful.

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Priority Sector Lending: An Impact Analysis

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Abstract

The priority sector constitutes a major chunk of the bank credit say 40%. The present study focuses on banking sector in terms of Priority Sector Lending. The nationalization of the 14 major commercial banks in July 1969 led to a considerable reorientation of bank lending, especially to the priority sectors of the economy which had not previously received sufficient attention from the commercial banks. It was observed that the bulk of bank advances was directed to large and medium-scale industries, and big and established business houses, while Agriculture, Small Scale Industries and exports – the vital sectors of the economy – did not receive adequate attention. As a measure of social control over banks, the Reserve Bank of India prescribed a modified format for reporting priority sector advances and issued certain guidelines in February 1972, indicating the scope of the items to be included under the various categories of priority sector.

This study examines the Nature and Degree of Relationship between each priority sector lending ratio and each financial ratio. It also exhibits impact (positive / adverse) of lending to each selected priority sector upon each selected financial parameter of public sector banks during the study period. The statistical significance of each relationship is also tested. For the purpose of this analysis, various priority sector lending ratios are worked out as a percentage of Total Advances. The study covers seven years period has been selected from 2007-08 to 2013-14 and 6 Public Sector Banks viz. State Bank of India and its Associate Banks operating in India have been selected as sample. Karl Pearson's Coefficient of Correlation and test of significance is used for the analysis.

Key Words : Priority Sectors Lending (PSL), Micro & Small Enterprises (MSEs), Weaker Section (WS), HF (Housing Finance), EL (Education Loan), PSBs (Public Sector Banks).

Introduction

As per RBI guidelines a certain fixed percentage of total finance (reviewed from time to time) must flow to Priority Sectors where

there always exists a risk of non-repayment of interest and installments, as a result of that the overall financial performance of a bank is affected in terms of high level of Non Performing Assets (NPAs), more blocking of funds in form of reserves and provision against NPAs, interest income leakages, less return on funds deployed, affects net worth and overall profitability of banks.

In this backdrop it becomes very important to understand the relationship of lending to various Priority Sectors by banks and Financial Performance of banks i.e. Whether there exists any positive or adverse impact of change in the level of priority sector lending upon financial performance of banks.

In this analysis, an attempt has been made to study relationship between each selected Priority Sector Lending Ratio with each of the Financial Ratio of selected Public Sector Banks during the study period. For the purpose of the analysis, Karl Pearson's Coefficient of Correlation test is used with the help of SPSS Software. Further, whether the relationship is statistically significant at 5% level or at 1% level, is also tested with the help of Test for Significance of correlation coefficient.

This study examines the Nature and Degree of Relationship between each priority sector lending ratio and each financial ratio. It also exhibits impact (positive / adverse) of lending to each selected priority sector upon each selected financial parameter of public sector banks during the study period. The statistical significance of each relationship is also tested.

Literature Review

P. Vimala (2002), "A Study on Priority Sector Lending by Commercial Banks in Kerala", (<http://www.mgutheses.in/page/?q=T%201543&search=&page=&rad=#>) described about genesis and concept of priority sector lending, socio banking profile of Kerala state. The study was based on both secondary as well primary data. The growth of deposits, advances and priority sector advances of all scheduled commercial banks in Kerala have been studied since nationalization of banks in 1969. The study

analysed District Credit Plans sector wise viz. Agriculture, SSI and Tertiary Sector from 1991-92 to 2000-01 i.e. for ten years. On the basis of the primary data collected, it analysed the socio banking profile of borrowers, reasons for availing bank loans, services offered by the banks and hardships in obtaining loans. The study also included comparative analysis of Priority Sector Advances among State Bank Group, Nationalised Banks and Other Scheduled Commercial Banks.

Vora Ashish P. (2008), on "Impact Of Selected Banking System On Small Scale Industries With Special Reference To Gujarat", the researcher studied Bank-wise, District wise and Region wise allocation of credit plan for Small Scale Industries(SSIs) as well as Bank-wise, District wise and Region wise achievement of credit of selected nationalized banks for SSIs in Gujarat state. Data of nationalised banks for ten years i.e. from 1997 to 2006 were analysed for study purpose. It mainly studied two sectors viz. Agriculture and SSIs. It also discussed about inter banking issues on evaluation and grant of credit to SSIs.

M. Prasada Rao (2010), a study on "Impact Of Self Help Group –Bank Linkage Programme And Its Role On The Upliftment Of The Poor" (Special Reference To Raigad District, Maharashtra State). The study based on secondary data as well as primary data collected from field survey mainly from a) Self Help Groups(SHG) of Visakhapatnam, Raigad, & Thane, b) Individuals and c) Banks and Chairman of SHGs. The study concluded that microfinance can contribute to solving the problem of inadequate housing and urban services as an integral part of poverty alleviation programmes. It suggested to provide multi-purpose loans or composite credit for income generation, housing improvement and consumption support. Microfinance institutions should contribute more to this by building financial discipline and educating borrowers about repayment requirements.

R. Maasdam and Robert Lensink (2013), in their thesis on "Microfinance, Indian subprime and new regulation", the study was mainly about the regulatory response to the 2010 microfinance crisis in Andhra Pradesh, India. In response to the crisis, the Reserve Bank of India (RBI) installed the Malegam committee. The results of the Malegam report triggered new regulation for NBFC-Micro Finance Institutions (MFIs). This paper set out to investigate whether the regulatory response to the 2010 microfinance crisis in Andhra Pradesh was adequate and whether it will help the sector to develop in a sustainable matter. The study concluded that the regulatory response was fairly adequate in the sense that it addressed the six likely causes

of the microfinance crisis: credit boom to MFIs, lack of regulation, differing state agenda, usury interest rates, pre-existing SHG framework and coercive recovery methods. Moreover, it also recommended the introduction of more extensive regulation for the microfinance sector and also the centralized supervision over the sector.

R. K. Uppal (2009), in their study on "Priority sector advances: Trends, issues and strategies", was based on the parameters like lending to priority sector by public, private sector and foreign bank groups, targets achieved by public, private sector and foreign bank group, Non-performing assets (NPAs), while lending to priority sector. All the parameters have been analyzed for the period, 2006 - 2007. The study concluded that public sector banks have not achieved the target of 40% while private sector banks have achieved the overall target. Any private sector bank could not achieve the 10% target by lending to weaker section. On the other hand, foreign banks have achieved the small scale industries' export credit and overall target. NPAs of public sector banks have increased because of high priority sector advances. The paper discussed the problems or issues which arise due to priority sector advances and also suggested some strategies to sought out these issues. It suggested that the concerns for achieving quantitative targets within stipulated time frame irrespective of assessed demand or potential have caused an erosion of the qualitative aspects of lending which have an effect on the viability of the lending institutions. Bank should fix quantitative as well as qualitative targets so that viability of the banks can increase.

P. Raman & Dr. N. Thangavel (2011), in the study "Social Banking In India: Priority Sector Lending And Its Developments -A Study, was conducted for India to know about the preference of Indian commercial banks viz. Public Sector Banks (as a whole) and Private Sector Banks (as a whole) in the area of Social Banking in particular reference to Priority Sector Credit. The study period covered over the period of 5 years and in some cases 10 years starting from 2001 to 2010. The data analysis based on secondary data collected from different published journals, reports and magazines. The study analysed the effects of the credit system by commercial banks in the priority segments viz, Agriculture, Small Business, Rural and Weaker sector development. This paper analyzed the various constructs of social banking in India. It also analyzed some of the financial facts of social banking. It concluded that Priority sector lending is a notable initiative of the government of India to strengthen the social banking concept. Branch banking into unbanked areas and

priority sector lending to target sectors have succeeded in the reduction of poverty in India. The extension of banks to rural areas is due to increase in agricultural and non agricultural output. A study on "Effects of Reserve Bank of India (RBI) Regulations on Priority Sector Lending for Micro Finance Institutions (MFIs)" is a collaboration of six MRAP professors and two CMF researchers. The study involves researchers interviewing 32 MFIs representatives across 7 states to understand their perspectives on the effect of some of the Malegam Committee recommendations and Reserve Bank of India (RBI) guidelines for MFIs to qualify for priority sector advances. Altogether, the researchers interviewed 15 NBFC-MFIs and 17 NGO-MFIs, a total of 32 MFIs in 7 states viz. a) Andhra Pradesh b) Delhi c) Karnataka d) Maharashtra e) Orissa f) Tamil Nadu and g) West Bengal. In this paper the researchers presented how microfinance institutions are responding to the new RBI regulations. The paper also reviewed responses from the MFIs and present the findings highlighting practitioners' outlook towards the strengths and weaknesses of some of the RBI guidelines mentioned above. It highlighted the current funding situation among the interviewed MFIs and how these MFIs have changed their business strategies to fit into the regulations.

Objectives of the Study

1. To investigate the impact of advances to selected priority sectors viz. agricultural advances, Micro & Small Enterprises (MSEs) Advances, Housing Financing, Education Loans, Advances to Weaker Section, on selected financial parameters of selected banks.
2. To analyse and interpret impact of Priority Sector Lending on financial performance of selected Public Sector Banks operating in India.

Period of the Study

The period of the study ranges from 2007-08 to 2013-14 i.e. 7 years. RBI guidelines for Priority Sector Lending in the year 2007-08 and onwards up to 2014 are more or less similar. No major changes are observed during this period. In July 2008 guidelines Priority Sector classification has been made more specific and broad. Therefore, considering availability of comparable data, the researcher has selected the study period from 2007-08 to 2013-14 i.e. 7 years.

Data Collection

The main source of data for the study is secondary data, collected from the published Annual Reports of selected Public Sector Banks and Reserve Bank of India website.

Sample Size

For this study, State Bank of India and its Associate Banks i.e. total 6 Public Sector Banks operating in India as on 31st March 2014 are selected as sample based on the availability of required data. Public Sector Banks (PSBs) are the leading players in banking sector in India since nationalization. Therefore, PSBs are more expected to ensure full adherence to the priority sector lending norms by covering huge mass of the people/ borrowers according to their eligibility criteria. Further, it is also observed that the systems and procedure for lending to priority sectors are more specifically defined and being followed by PSBs. Considering the significance of PSBs in priority sector lending and State Bank Group holds major chunk of total advances, the researcher has selected Public Sector Banks for the purpose of this study. So total Six banks have been covered for the purpose of the study as listed below:

- 1 State Bank of India (SBI)
- 2 State Bank of Bikaner & Jaipur (SBBJ)
- 3 State Bank of Hyderabad (SBH)
- 4 State Bank of Mysore (SBM)
- 5 State Bank of Patiala (SBP)
- 6 State Bank of Travancore (SBT)

Scope of the Study

For this research study, few parameters in relation to the priority sector lending and few major financial parameters of public sector banks have been considered by the researcher. Priority Sector Segments: Reserve Bank of India (RBI) issues Master Circulars on Priority Sector Lending every year. RBI has issued number of guidelines on Priority Sector Lending from time to time with some modifications. Considering various guidelines, the researcher has selected six broad segments of priority sector for the purpose of the study. These segments are the areas where major portion of Priority Sector Advances by banks is concentrated.

The Priority Sector Parameters selected are

- Total Priority Sector Lending
- Agriculture Advances (direct & indirect)
- Micro & Small Enterprise (MSEs) Advances
- Housing Loans
- Education Loans
- Weaker Section Advances

Financial parameters selected are

- Net Profit
- Return on Advances (ROA)
- Return on Equity (ROE)
- Non Performing Assets (NPA)

Tools for Analysis

For the analysis and evaluation purpose, Karl Pearson's coefficient of Correlation ('r') and Test of Significant of ('r') is used.

Table 1: Karl Pearson's Coefficient Of Correlation ('R') *

Degree	Values of 'r'	Interpretation
Perfect	if the value is + -1	the value of Y exactly increases / decreases as the value of X increases
High Degree	between (+-0.75) & (+-1)	the value of Y strongly increases / decreases as the value of X increases
Moderate Degree	between (+ -0.25) & (+ -0.75)	the value of Y moderately increases / decreases as the value of X increases
Low Degree	between 0 and (+ -0.25)	the value of Y slightly increases / decreases as the value of X increases
No Correlation	zero	There is no connection between two variables.

(*Research Methodology, Dr. Priti R Majhi & Dr. Prafull K Khatua, Himalaya Publishing House, Mumbai, 2013).

Table 2

'r' value	- 'r' value marked with (*) - Correlation is significant at 0.05 level
Degree of freedom(d.f.)	5 (n - 2) (n = 7)
Level of Significance	(α = 0.05)
Type of Test	Two-tailed test
Priority Sector Lending Ratios	-as a proportion to Total Advances

The following ratios are worked out for the analysis :

Priority Sector Lending Ratios - as a percentage of total advances

PSL Ratio = Total Priority Sector Lending (PSL) / Total Advances

Agri Ratio = Total Agriculture Advances (Agri) / Total Advances

MSE Ratio = Micro & Small Enterprises Advances(MSE) / Total Advances

WS Ratio = Weaker Section (WS) Advances / Total Advances

HF Ratio = Housing Finance (HF) / Total Advances

EL Ratio = Education Loans (EL) / Total Advances

Financial Ratios considered for the study are as under:

Net Profit Ratio (NP) = Net Profit / Total Assets

Return on Advances Ratio (ROA) = Interest Earned on Advances / Total Advances

Return on Equity Ratio (ROE) = Net Profit / (Capital + Reserve + Surplus)

Non Performing Assets Ratio (NPA) = NPA / Net Advances

Hypotheses

H_1 : There is no significant relationship between Selected PSL Ratios and NP Ratio of SBI & Associate Banks during the study period.

H_2 : There is no significant relationship between Selected PSL Ratios and ROA Ratio of SBI & Associate Banks during the study period.

H_3 : There is no significant relationship between Selected PSL Ratios and ROE Ratio of SBI & Associate Banks during the study period.

H_4 : There is no significant relationship between Selected PSL Ratios and NPA Ratio of SBI & Associate Banks during the study period.

Limitations of the Study

- The study is limited to only selected Public Sector Banks in India i.e. 6 banks only.
- All other banks working in India are not covered in this study. So, it may be difficult to generalize the conclusions, drawn from this study, to the whole banking sector.
- The study is limited for the period of 7 years only i.e. 2007-08 to 2013-14.
- Priority Sectors are considered broadly for the purpose of this study. Sub categories under different sectors are not considered.
- The present study is mainly based on secondary data and secondary data have their own limitation and therefore its findings depend entirely on the accuracy of such data.
- The study is largely based on accounting and statistical techniques that have their own limitations and it will affect the study.

Table 3: Selected PSL Ratios and Financial Ratios of SBI & Associate Banks

Ratios	PSL Ratios						Financial Ratios			
Banks	Total PSL	AGRI	MSE	WS	HF	EL	NP	ROA	ROE	NPA
SBI	27.15	12.87	7.30	7.81	7.48	1.23	0.83	9.26	14.63	1.91
SBBJ	37.27	17.17	11.97	13.24	6.19	0.90	0.84	10.53	18.70	1.46
SBH	34.02	15.75	10.74	8.75	7.44	1.54	0.92	10.62	20.13	1.14
SBM	31.19	14.29	9.00	10.74	7.28	1.44	0.76	10.54	14.77	1.61
SBP	34.20	14.13	14.06	8.74	5.05	0.56	0.69	10.76	15.10	1.37
SBT	38.14	13.08	8.55	10.59	12.05	3.77	0.82	10.24	19.94	1.31

(Source: Calculated by author based on secondary data from company websites/RBI)

Analysis

Table 3 indicates average of seven years' selected Priority Sector Lending (PSL) ratios and selected financial ratios of SBI and Associate Banks. It exhibits that during the study period, total PSL ratio (27.15%), Agri ratio (12.87%), MSE ratio (7.30%) and WS ratio (7.81%) are the lowest in SBI. Total PSL ratio (38.14%), HF ratio (12.05%) and EL ratio (3.77%) are the highest in SBT. Agri ratio (17.17%) & WS ratio (13.24%) are the highest in SBBJ. MSE ratio (14.06%) is the highest whereas HF ratio (5.05%) and EL ratio (0.56%) are the lowest in SBP. In SBI, ROA ratio (9.26%) & ROE ratio (14.63%) are the lowest and NPA ratio (1.91%) is the highest.

H_1 : Relationship between Selected PSL Ratios and NP Ratio of SBI & Associate Banks

Table 4 : Correlation between PSL Ratios and NP Ratio

Coefficient of Correlation	Selected Priority Sector Lending Ratios					
	Total PSL	Agri	MSE	WS	HF	EL
r	0.077	0.352	-0.377	0.047	0.327	0.270
t-cal	0.173	0.841	0.910	0.105	0.774	0.627
t-tab	2.776 (at $\alpha = 0.05$)					
d.f.	4 (n-2 i.e. 6-2)					

Table 5 : Impact of Selected PSL Ratios on NP Ratio

PSL Ratios	Nature of Relationship with NP Ratio	Impact on NP	Interpretation
Total PSL, WS	Low Positive	Positive	NP increases slightly with increase in these advances
Agri, HF, EL	Moderate Positive	Positive	NP increases moderately with increase in these advances
MSE	Moderate Negative	Adverse	NP decreases moderately with increase in MSE advances

H_2 : Relationship between Selected PSL Ratios and ROA Ratio of SBI & Associate Banks

Table 6: Correlation between PSL Ratios and ROA Ratio

Coefficient of Correlation	Selected Priority Sector Lending Ratios					
	Total PSL	Agri	MSE	WS	HF	EL
r	0.639	0.569	0.759	0.406	-0.270	-0.141
t-cal	1.858	1.547	2.607	0.993	0.627	0.318
t-tab	2.776 (at $\alpha = 0.05$)					
d.f.	4 (n-2 i.e. 6-2)					

Table 7: Impact of Selected PSL Ratios on ROA Ratio

PSL Ratios	Nature of Relationship with ROA Ratio	Impact on ROA	Interpretation
Total PSL, Agri, WS	Moderate Positive	Positive	ROA increases moderately with increase in these advances.
MSE	High Positive	Positive	ROA increases strongly with increase in MSE advances.
EL	Low Negative	Adverse	ROA decreases slightly with increase in EL.
HF	Moderate Negative	Adverse	ROA decreases moderately with increase in housing finance.

H₃: Relationship between Selected PSL Ratios and ROE Ratio of SBI & Associate Banks

Table 8: Correlation between PSL Ratios and ROE Ratio

Coefficient of Correlation	Selected Priority Sector Lending Ratios					
	Total PSL	Agri	MSE	WS	HF	EL
r	0.750	0.423	0.060	0.356	0.507	0.547
t-cal	2.535	1.044	0.134	0.852	1.315	1.461
t-tab	2.776 (at $\alpha = 0.05$)					
d.f.	4 (n-2 i.e. 6-2)					

Table 9: Impact of Selected PSL Ratios on ROE Ratio

PSL Ratios	Nature of Relationship with ROE Ratio	Impact on ROE	Interpretation
MSE	Low Positive	Positive	ROE increases slightly with increase in MSE advances
Total PSL, Agri, WS, HF, EL	Moderate Positive	Positive	ROE increases moderately with increase in these advances

H₄ : Relationship between Selected PSL Ratios and NPA Ratio of SBI & Associate Banks

Table 10: Correlation between PSL Ratios and NPA Ratio

Coefficient of Correlation	Selected Priority Sector Lending Ratios					
	Total PSL	Agri	MSE	WS	HF	EL
r	-0.764	-0.418	-0.530	-0.171	-0.153	-0.265
t-cal	2.648	1.029	1.398	0.388	0.346	0.615
t-tab	2.776 (at $\alpha = 0.05$)					
d.f.	4 (n-2 i.e. 6-2)					

Table 11: Impact of Selected PSL Ratios on NPA Ratio

PSL Ratios	Nature of Relationship with NPA Ratio	Impact on NPA	Interpretation
WS, HF	Low Positive	Positive	NPA decreases slightly with increase in these advances
Agri, MSE, EL	Moderate Negative	Positive	NPA decreases moderately with increase in these advances
Total PSL	High Negative	Positive	NPA decreases strongly with increase in total PSL

Findings

- The coefficient of correlation between selected PSL ratios and Net Profit ratio of SBI & Associate Banks: The nature of relationship and impact of selected PSL Ratios on NP Ratio is shown in Table 5. The **Test of Significance**: here, $t_{cal} < t_{tab}$ in all ratios. Therefore, hypothesis H_1 is accepted and it can be concluded that there is no significant relationship between all selected PSL Ratios and NP ratio of SBI & Associate Banks during the study period.
- Table 6 exhibits the coefficient of correlation between selected PSL ratios and ROA ratio of SBI and Associate Banks. The nature of relationship and impact of selected PSL Ratios on ROA Ratio is indicated in Table 7. **Test of Significance**: Here, in all ratios, $t_{cal} < t_{tab}$ and hypothesis H_2 is accepted i.e. no significant relationship between all selected PSL Ratios and ROA ratio of SBI & Associate Banks during the study period.
- Table 8 exhibits the coefficient of correlation between selected PSL ratios and ROE ratio of SBI & Associate Banks. The nature of relationship and impact of selected PSL Ratios on ROE Ratio is indicated in Table 9. **Test of Significance**: Here, $t_{cal} < t_{tab}$ in all selected ratios. Therefore, hypothesis H_3 is accepted and it can be concluded that there is no significant relationship between all selected PSL Ratios and ROE ratio of SBI & Associate Banks during the study period.
- Table 10 exhibits the coefficient of correlation between selected PSL ratios and NPA ratio of SBI & Associate Banks. The nature of relationship and impact of selected PSL Ratios on NPA Ratio is indicated in the Table 11. **Test of Significance**: $t_{cal} < t_{tab}$ in case of all selected PSL ratios. Hence, hypothesis H_4 is accepted that there is no significant relationship between all selected PSL Ratios and NPA Ratio of SBI & Associate Banks during the study period.

Overall Findings

- Relationship between MSE Ratio & NP ratio is moderate negative ($r = -0.377$). It reveals that MSE advances have adverse impact on Net Profit of SBI & Associate Banks during the study period i.e. with increase in MSE advances, Net Profit of banks decreases.
- HF Ratio ($r = -0.270$) and EL Ratio ($r = -0.141$) have negative relationship with ROA ratio. Hence, it can be concluded that with the increase in Housing Finance and Education Loans, ROA decreases i.e. they affect Return on Advances adversely

- MSE advances ($r = 0.060$) has low positive relationship with ROE i.e. MSE advances do not contribute much to Return on Equity of SBI & Associates during the study period.
- All selected priority sector lending ratio has negative correlation with NPA ratio. Values of 'r' for total PSL, Agri, MSE, WS, HF & EL ratios are respectively, (-0.764) , (-0.418) , (-0.530) , (-0.171) , (-0.153) & (-0.265) . It reveals that with increase in lending to selected priority sectors, there is decrease in NPAs. Thus, all selected ratios have positive impact on NPAs of SBI & Associate Banks during the study period.
- All other selected priority sector lending ratios have positive relationship and hence positive impact on all selected financial ratios. It reveals that increase in these advances causes improvement in financial performance of SBI & Associates.
- Hypotheses are accepted at 5% level of significance in all cases. It shows that relationship between all selected priority sector lending ratios and all selected financial ratios of SBI & Associate Banks is not significant during the study period.

Conclusion

The overall analysis reveals that in SBI & Associate Banks – bank group as a whole, MSE advances affect Net Profit adversely. Housing Finance and Education loans affect Return on Advances adversely. Lending to all other selected priority sectors has positive impact on selected financial parameters of banks during the study period. The relationship between all selected priority sector ratios and all selected financial ratios is not significant at 5% level and hypotheses are rejected.

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Consequential Influence of Shopper's Service Perception on Impulse Buying

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Abstract

Customer service is known for years to have significant relation with satisfaction; but impulse buying has not yet been studied in relation with service. When a customer receives a superior service she is expected to be emotionally laden favourably towards the store. However, does this favourable emotion translates into impulse buying is the central focus of this article. The research is setup in metro city in India and survey is conducted through structured questionnaire among students of a prominent university with large student base. Sample units are judged for their exposure to retail stores among the population. Analysis is done through suitable statistical techniques. Customer Service offered at retail store is found to have no significant relation with consumer's impulse buying tendency and frequency of shopping visits. However, customer service is found to have significant relation with patronage intentions.

Key words : Impulse buying, Customer service, Retailing, Patronage intention, Shopping frequency.

Introduction

Retail sector in India is growing day by day at a fast pace. The reason for this growth is the dramatic increase in the personal incomes. The other reason for this growth in retail sector is the easy availability of credit now a days. But study shows that most of the revenue collected by retail sector is due to impulse buying. Impulsive purchase behaviour is driven by pleasure seeking goals causes a consumer to experience desires for different types of products. But the question of utmost importance is "what is impulse buying"? Impulse buying is sudden and spontaneous purchasing action without any pre-shopping intention to buy a specific product. But this is not the single definition of impulse buying as there are many more definitions because the researchers have been working on impulse buying for a long period of time. The present era is a "Retail Era". Most of the Indian cities now a days have different type of retail markets and these retail stores are the first choice for consumers for their shopping preferences. In easy words it could be said that these stores are

crowd pullers. The main aim of this paper is to map shopper's service perception with reference to impulse buying. The retail industry heavily depends on the service provided to the consumers. The more the level of service provided by the retailers the more will be the profit earned by the retailers.

Research Objectives

- 1.To understand the relationship of consumer service with impulse buying.
- 2.To understand the relationship of consumer service with store patronage intentions.
- 3.To evaluate the effect of consumer service on frequency of shopping.

Literature Review

Service and Quality in retail industry has been in the centre of attraction in numerous studies. The most desired approach to conceptualizing and measuring service quality perhaps traces back to the SERVQUAL scale (Parasuraman, et. al., 1993). This scale is applicable to retailers in several studies.

Dabholkar et al. (1996) developed Retail Service Quality Scale (RSQS) consisting of five major dimensions, namely physical aspects, reliability, personal interaction, problem solving and policy. Physical aspects, which is an extension of tangibles factor in the SERVQUAL, includes physical facilities such as store appearance, store ambience, store amenities and convenience offered by store layout. Reliability is as much similar to the SERVQUAL, and it consists of keeping promises and doing it right. Personal interaction denotes service employees' courtesy and helpfulness, and how they encourage customers' confidence and motivate them. Problem solving refers to management of customer problems such as complaints, returns and exchanges. Policy addresses store policy on matching their customers' needs, such as convenient opening hours, parking and payment. These five factors help service providers diagnose and improve service areas which are in need of attention.

Berman and Evans (2005) states that overall retail image is

influenced by store location, merchandise attributes, pricing, firm's positioning, customer service, target market, attributes of physical facilities, shopping experience, promotion tools (such as advertising, public relations, personal selling, sales promotion) and community service. Further, Berman and Evans (2005) note that a retailer's image depends heavily on its 'atmosphere' or the psycho-logical feeling a customer gets when inside that retail outlet.

Maline (1995) found that American drug store shoppers consider the following factors (apart from convenient accessible location) as the most crucial when they decide to patronise a particular store: knowledgeable staff, competitive pricing, fast check out times, store layout that enhances shopping convenience and speed and one-stop shopping.

Gale (1992), quantitatively assesses the relationship between level of service quality and willingness to purchase. Customers who rated the company's overall quality as excellent, over 90% expressed willingness to purchase from the same company again. For customers rating the service as good, fair, or poor, the percentages decreased to 60%, 17%, and 0%, respectively.

Parasuraman et. al. (1993) found that there are two levels of customer expectations. The first level is desired service, which is the level of service the customer hopes to receive, consisting of a blend of what the customer believes can and should be delivered. The second, lower level of expectations is adequate service, which is the level of service the customer will accept. Adequate service is the minimum service a company can provide and still hope to meet customers' basic needs.

Babin, et. al. (1994), categorized the product into two types with different applications. The very first category corresponds to hedonic products which are mainly used for their hedonic advantages and the second category corresponds to functional products which are mainly used for practical values. Impulse purchasing generally falls under the category of hedonic products which are not mostly supposed to accomplish practical needs because Impulse purchase happens while a customer is motivated by sudden and influential incentives to buy a product.

Spiggle and Sewall (1987) "Patronage refers to a consumer's purchase pattern over a series of purchase tasks. Retail patronage patterns may result from loyalty based on their commitment and strong preference or from low consumer involvement whereby habit or variety seeking dictate patronage patterns. Retail patronage is not a binary outcome; a consumer may spend 75% of expenditures at store X and the other 25%

elsewhere.

Yavas and Babakus (2009) stated that an understanding of the behaviour of patronage is very important for retailers to identify shopper typology, targeting of those most likely to purchase and anticipate the frequency of customer visits to the shopping.

Stern (1962) wrote that impulse buying is synonymous with "unplanned buying" and defines it as "any purchase which a shopper makes but has not planned in advance." And this definition can be found in the research of Cobb and Hoyer (1986) and Kollat and Willet (1967).

Impulse buying refers to a distinctive type of an unplanned purchase and the fact that impulse purchase is unplanned is consistent with all definitions of impulse buying. Therefore, all impulse purchases can be categorized as unplanned purchases, but not all unplanned purchases can be labelled as impulse purchases.

Beatty, F. (1998) suggested a few things. According to him in-store browsing appears to be positively affected by one's available time and one's impulse buying tendency, and in turn, has a positive impact on one's positive feelings and impulse buying urges. He also found that situational variables (time availability and money availability) play a vital role in impulse purchasing. The more the time a shopper browses in the store the greater the chances of impulse purchasing if the shopper has a reasonable amount of money. Another finding of the study is the association of affect with impulse purchasing. A shopper with a positive mood act more on his buying urges on the other hand with a negative mood has very less chances to act on the buying urges.

Dholakia (2000) has identified three most important factors of impulsive purchase behavior, such as marketing stimuli, impulsivity trait and situational factors. He criticized previous works on impulsive consumer purchase behavior, stating that the research was more focused on hedonic aspects of impulsive purchasing ignoring cognitive and volitional processes as well as very little attention has been focused to trying to understand mechanisms of impulsive resistance. Marketers may increase the probability to buy impulsively, manipulating store atmospherics. Existence of one or more factors determine a consumer's urge to buy impulsively. When a consumer feels urge to buy impulsively, certain mental responses are automatically triggered to identify any factor constraining impulsive purchase. It is determined that a consumer estimates three factors that may constrain impulsive buying: current impediments, consideration

of long-term consequences and anticipatory emotions.

Sharma et. al. (2012) stated that Impulsive buying is an unplanned, hedonic purchase that follows a sudden urge, or in other words impulsive buying behaviour is a sudden, compelling, hedonically complex purchasing behaviour in which the rapidity of the impulse purchase excludes thoughtful, deliberate consideration of all information and choice alternative.

Chaturvedi (2013) found that Trialability facility positively influences a shopper's attitude to buy impulsively but in practice found that Trialability gives the shopper time to rationalize his/her thinking and sometimes a shopper declines a product that he/she has tried or evaluated. He also found that in-store factors that are significantly responsible for impulse purchase are discount and festive offers, visual merchandising, staff attitude, store design, in-store promotion and Retailscape.

Research Hypothesis

H₀1: Consumer service is not correlated with impulse buying behaviour of consumer.

H₀2: Consumer service is not correlated with patronage intentions.

H₀3: Consumer service is not correlated with the frequency of consumer visits.

Research Methodology

The research methodology used in this paper was Exploratory cum Descriptive. A structured questionnaire sheet has been prepared to conduct survey. Purposive sampling technique has been used in absence of sampling frame. The population for this research is the students studying in different courses pursuing graduation, post-graduation and Ph.D in the university (BBAU, Lucknow). The total sample size is 100. The respondents are the students who have been to organized retail stores in the last one week. Correlation analysis and two tailed t-tests is applied for hypothesis testing. There will be use of graphs and tables for the purpose of descriptive analysis.

Data Analysis and Findings

1. Relationship between consumer service and impulse buying behaviour.

H₀1: Consumer service is not correlated with impulse buying behaviour of consumer.

Table 1: Descriptive Statistics

	Mean	Std. Deviation	N
Avg_cust_ser	3.6778	.80460	100
Avg_imp_buy	3.2111	.90754	100

Table 2: Correlations between Customer service and Impulse buying

		Avg_cust_ser	Avg_imp_buy
Avg_cust_ser	Pearson Correlation	1	.023
	Sig. (2-tailed)		.904
	N	100	100
Avg_imp_buy	Pearson Correlation	.023	1
	Sig. (2-tailed)	.904	
	N	100	100

Analysis

As it can be seen from the Table 2 coefficient of correlation is 0.023 which is close to 0, also significance value for 2 tailed t test is 0.904 greater than 0.05; Null hypothesis cannot be rejected.

Findings

So there is no relation between the impulse buying behaviour of consumer with the customer service offered at retail store.

2. Relationship between customer service and patronage intentions.

H₀2: Consumer service is not correlated with patronage intentions.

Table 3: Descriptive Statistics

	Mean	Std. Deviation	N
Avg_patron	3.1667	.64772	100
Avg_cust_ser	3.6778	.80460	100

Table 4: Correlations between customer service and Store patronage intentions

		Avg_patron	Avg_cust_ser
Avg_patron	Pearson Correlation	1	.482**
	Sig. (2-tailed)		.007
	N	100	100
Avg_cust_ser	Pearson Correlation	.482**	1
	Sig. (2-tailed)	.007	
	N	100	100

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

Analysis

As it can be seen from Table 4, coefficient of correlation is 0.482. which is close to 1, also significance value for 2 tailed t test is significant at 0.01 level; Null hypothesis is rejected.

Findings

So there is a relation between the store patronage intentions of consumer with the customer service offered at retail store.

1.Relationship between customer service and frequency of consumer visit.

H₀3:Consumer service is not correlated with the frequency of consumer visits.

Table 5: Descriptive Statistics

	Mean	Std. Deviation	N
Avg_cust_ser	3.6778	.80460	100
Avg_freq	3.1333	.77113	100

Table 6: Correlations between frequency of visits and customer service

		Avg_cust_ser	Avg_freq
Avg_cust_ser	Pearson Correlation	1	-.009
	Sig. (2-tailed)		.964
	N	100	100
Avg_freq	Pearson Correlation	-.009	1
	Sig. (2-tailed)	.964	
	N	100	100

Analysis

As it can be seen from the Table 6, coefficient of correlation is - 0.009 which is close to 0, also significance value for 2 tailed t test is 0.964 greater than 0.05; Null hypothesis cannot be rejected.

Findings

So there is no relation between frequencies of consumer visits with the customer service offered at retail store.

Conclusion

The study reveals that there is a direct relationship between customer service and store patronage intentions. As the patronage intention is intent to continue to prefer the store to others, intent to consider the store as the first choice for future purchases, intent to say positive things about the store to other people. The more the customer service the more will be the store patronage intentions. But when it comes to impulse buying the customer service at retail store is nowhere in the scenario. As impulse buying is an unplanned and unthoughtful purchasing act but when a salesperson interacts with shoppers, part of customer service, and attends them for providing assistance then buyer may get time to rationalise their buying decision which will

not be considered as impulse purchase. Another aspect of the study is dependence of frequent consumer visits on customer service. Based on the findings it is concluded that there is no relation between customer service offered at the store and frequent consumer visits.

Limitations of the study

A small sample size is matter for concern for generalization of the study. Further sample is selected from one university and there may an element of homogeneity in the population that may again effect the generalization of findings.

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A Study of Faculty perception towards HR policies, Autonomy, and Monetary benefits and their Impact on Performance of Higher Education Institutions

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Abstract

This study aims to analyze the relationship between the teacher's perceptions of human resource practices and the institutional performance in selected higher education institutions in Indore city. A total of 250 teachers from selected higher education institutions in Indore responded to the survey. The survey questionnaire had 23 items covering selected HRM practices and institutional performance. Factor analysis was applied which reduced these 23 items into three factors namely HR Policies, Autonomy and Monetary Benefits. The study has found the perception of teachers' of selected higher education institutions HR policies, Autonomy and Monetary Benefits has significant effect on the Institutional performance.

Keywords: HR Policies, Autonomy and Monetary Benefits and Institutional performance.

Introduction

Higher education institutions need transformation and reformation to give fruitful outcome to the society. For the purpose institutions are supposed to develop, motivate and retain an effective workforce. Human resource management practices one of the major criterions to maintain and increase the productivity of the faculty members. The practices such as recruitment, selection, staffing, training and development, welfare, promotion, motivation, compensation and rewards, performance review, career planning etc, lie at the care of efficiency of faculty of the institutions. The study mainly focuses on faculty perception towards HR policy, autonomy, and monetary benefits of higher education institutions. HR policy is basically a statement provides guidelines for a wide variety of employment relationships in the institutions. It decides institutional intentions in recruitment, selection, promotion, development, compensation, motivation and leading and directing people in the institution. It is an integral part of the whole policy structure of an enterprise. Reward and recognition is also one of the most important factors to motivate employees. Over many decades the monetary incentives has also been adopted by

numerous institutions to motivate their faculty to retain for long term.

Job autonomy is a condition, variety, job significance and job importance that is believed to have an impact on employees' responses to work. It is basically a freedom allowed to employees in area of job schedule, work freedom, methods to complete task and area to perform the task and fulfilling the responsibilities. It is a feeling in one can perceive himself or herself flexible to go about one's work, and also can take control of the sequencing or fixing time of his or her tasks. Employees perceive job autonomy as a favourable workplace condition that expects faculty to practice their skills in fulfilling their job related risks. When the organization fails to provide autonomy at work, employees are more likely to withdraw themselves from their roles (Sake, 2006).

Review of literature

There is important and fast growing literature concerning the links relating to teachers' perception towards HR policy, autonomy and monetary benefits in higher education institutions. The review pertaining to HR policy, autonomy, and monetary benefits can be found in following studies discussed here. Organizational context can give rise to a variation of perceptions regarding HR policies depending on the cognitive processes, pre-employment history and organizational roles of distinct actors. HRM policies according to Bowen and Ostroff (2004) are distinctiveness. They mentioned that when practices in organizations are not made salient, visible, and understandable, ambiguity is definitely high, and employees will be more likely to refer to one another in an attempt to define the situation in their own way" (Bowen & Ostroff, 2004). Rajathi and Divya (2016) revealed in their study the relations between the educational qualification and HR policies. La Belle (2005) asserted that every individual has different perceptions of rewards and believes that such factors are the main driving force of satisfaction and that they help boost the employee to work harder and better.

Employees' perceptions towards their job autonomy tend to impact their psychological states of experienced meaningfulness

of work, felt responsibility, and knowledge of results (Nwoku, Chiamaka, & Tochukwu, 2013). The allowance of autonomy at work serves as a drive to employees who may extend a sense of return by showing higher levels of engagement in their jobs. The concept is therefore simple that when employees perceive themselves as having flexible power in achieving their organizational objectives, they are more likely to stay in their existing organizations because of improved ownership in work (Parker & Wall, 1998) and the increased motivation to master new tasks (Morgeson & Campion, 2003).

Hackman and Oldman (2005) viewed that in addition to salary and incentives, satisfaction with the job requires satisfaction with different aspects of the work, as well as variety in the abilities and activities required to completing the everyday jobs, and autonomy in performing work. Most organizations try to boost employee willingness to work harder by incorporating various rewards in their compensation systems. Employees must be able to see a clear connection between their job performance and the monetary benefits. Further, if employees perceive a lack of equity in benefits, they may lower their level of job performance or leave the organization. Employees select good monetary incentives are top motivational factors to boost their performance. At a deeper level, monetary rewards communicate what the company value and affect employees' emotional and familial well being. Catanzaro (2001) concluded that compensation has a profound effect over employee motivation. Psychologically employees are associated with this extrinsic factor and perform accordingly. The basic objective of providing monetary benefits to teachers in higher education institutions to attract, motivate and retain good people for the attainment of organizational goals. Therefore it should be acknowledge as a major factor to affect employee performance and retain them for long time period. Patton (1999) stated that it is funny if a person is not motivated to excel by money.

Objectives of the Study

- 1.To study the impact of HR Policies on the Institutional performance
- 2.To study the impact of Autonomy on the Institutional performance.
- 3.To study the impact of monetary benefits on the Institutional performance.

Research Methodology

The methodology used for the present study is as follows:

Research type: Descriptive Research.

Research area: This research was carried out in Indore City.

Universe: In this study the population refers to the faculty from various disciplines of higher education institutions.

Sampling method: Convenience sampling has been used for the purpose of this research. This method involves selection of sample elements that are most readily available to participate in the research according to the convenience.

Sample size: For the purpose of this study sample size selected comprises of 250 teachers working in higher education institutions of Indore City.

Tools for data collection: For the study only primary data has been used. A self-designed questionnaire, which has been made after studying the literature review and consulting with experts of educational field, is used as a tool for the primary data collection. The responses from the respondents were collected using both mode (online and offline). For the online collection, the Google Docs form had been created and through Emails, the respondents were communicated and personally time was taken and through hard copy the questionnaires were got filled for the offline mode.

Statistical tools: Correlation & Regression were applied on SPSS 20.0 to conclude the concrete results for the data analysis.

Table 1: Variables

Sr. No.	Factors	Variables
1	HR Policy	Accessibility to higher officials / Healthy working environment for growth & development / Well equipped library. / The academic staff appropriately represents in the Governing Body / Adequate and relevant information is provided at the time of recruitment / Focus on the contents & performance standards in subjects /Students' discipline and their behavioral problems / Policies and procedures are explained adequately Professional competencies Promote teamwork Confidence in the leadership Management follows policies and practices
2	Autonomy	Encouraged to participate in various seminars/conferences/workshops Trust in the management Promote the acquisition of professional competencies
3	Monetary Benefits	Rewards are strictly linked to performance Monetary assistance for attending the conferences/seminars/FDPs

(Source: Author, based on Literature review)

Results and Discussion

For the present study following hypothesis have been formulated:

H_{01} : There is no significant impact of HR policies on the Institutional performance.

H_{02} : There is no significant impact of autonomy on Institutional performance.

H_{03} : There is no significant impact of monetary benefits on the Institutional performance.

Table 2: Model Summary (n=250)

Factor	R	R ²	F	T-Value	Significance	Status
HR Policies	.800	.640	441.285	21.00	.000	Null hypothesis rejected
Autonomy	.393	.155	45.393	6.737	.000	Null hypothesis rejected
Monetary benefits	.430	.185	56.116	7.491	.000	Null hypothesis rejected

(Source: SPSS Output) Level of Significance is 5%

Table 2 shows the correlations and from this table it is evident that Pearson's correlation coefficient between Institutional performance and HR Policies is 0.800 which is significant since the significant value (p- value) .000 is less than 0.05. The relationship between Institutional performance and Autonomy is .393 at .000 and the relationship between Institutional performance and Monetary benefits is .430 at .000.

Therefore it is concluded that the linear relationship of HR Policies, Autonomy and Monetary benefits is significant with the Institutional performance. The coefficient of determination R² of HR Policies is 0.640 therefore, 64% of the variation in Institutional performance is explained by HR Policies. The coefficient of determination R² of Autonomy is .155 therefore, 15.5% of the variation in Institutional performance is explained by Autonomy. The coefficient of determination R² of the last factor Monetary benefits is .185 therefore, only 18.5% variation in Institutional performance is explained by Monetary benefits. The result concluded that the null hypothesis based on HR Policies, Autonomy and Monetary benefits was not accepted. Hence, these three factors have a significant effect on the Institutional performance.

Conclusions

The success of any organisation depends upon its human resources. Faculty being the core employee of institution of higher education plays important role in institution's success and in creating and promoting its good will and reputation. Therefore for proper management and performance of any institution of higher education faculty members' motivation and perception is unavoidable.

This study is an attempt to understand the perception of faculty members' in relation to their experience of the parameters such as; HR Policies, Autonomy and monetary Benefits and how these parameters helps in enhancing the Institutional performance to produce significant effect. It is concluded that Institutional performance has correlation with HR Policies, autonomy and monetary Benefits according to perception of faculty members' of selected higher education institutions in Indore. Thus, there is a significant effect of HR Policies, autonomy and monetary benefits on the institutional performance.

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H-index and its Variants to Measure the Researcher's Productivity: An Empirical Validation

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Abstract

The main objective of this article is to examine the usefulness of h-index and some of its important variants for measurement of researcher's productivity presented in the literature. In this paper, authors empirically tested that whether the variants developed are really useful to measure the contribution of researchers. The data for this study has been downloaded from SCOPUS database. Factor Analysis was used to identify the factors from h-index and its variants. The factor analysis using a dataset of researchers in RFID & SCM resulted in two factors namely quantity dimension of a researcher's output signifies the number of papers and quality dimension of a researcher's output describes the impact of the papers. As the last step in the factor analysis, authors also examine the fitness of the factor analysis for the data set. The authors test the convergent validity and discriminant validity and proved from the results that measurement scales used in this research is valid and correct. In the end, limitations and future research scope of this study discussed in the paper.

Keywords: h-index, g-index, h (2) index, a-index, r-index, factor analysis

Introduction

In today's scenario every research judgment decision for promotion, accepting research projects, and getting the financial support and so on, based upon the productivity of the researchers' contribution and thus measurement of research output of researchers become an important work in itself. For this, measurements there are different indicators which have been widely used and accepted in the literature. The majority of those indicators were either based on a total number of publications or/and the impact of their publications to measure the productivity of researchers in a particular field. Some authors have used the combination of these indicators to measure the productivity of researchers to get different perspectives of scientific output (Van Leeuwen et al., 2003) and found that how this combination of indicators can help to get a global perspective of the researchers' productivity (Leeuwen et al., 2003; Martin,

1996). One such indicator is h-index developed by Hirsch in 2005. The h-index is used to measure the productivity of an individual author by combining the quantity and quality of publications. Hirsch provided the method to get the value of h-index for an individual author as: "A scientist has index h if h of his or her N_p papers have at least h citations each and the other ($N_p - h$) papers have $<h$ citations each", where N_p = number of papers. For example, a scientist with an index of 50 has published 50 papers with at least 50 citations each. The numbers of publications giving a value of h-index are known as the h-core papers. There are many studies available in the past which depict that the researchers have huge interest towards h-index and it is proved through the number of publications on the topic (Ball, 2005, Glanzel, 2006). The benefit of using the h-index is that it is very easy for calculation and is based on both the quantity and the quality dimensions of the research output of a researcher. The notion of the single number representing the ranking of an individual researcher has its own importance for researchers because of its usefulness in comparison to peer judgments (Bornmann & Daniel, 2007). Apart from the easiness, there are certain other characteristics of the h-index identified by the researchers as h-index is objective in nature for the measurement of productivity of an individual researcher (Costas and Bordons; 2007) and its robust in nature (Vanclay; 2007). The h-index is helpful in determining the past and future productivity of a scientist (Ball, 2005, Hirsch, 2007).

Although the above points are very positive towards h-index and its wide acceptance and popularity in productivity measurement still it is not free from drawbacks explained by various researchers. Some of the major pitfalls are given by various researchers as the h index does not consider the citation counts of those papers which are having fewer than h citations (Franceschini & Maisano, 2010), true assessment of a researcher is not possible by h-index because of its inability to capture the complicated citation records (Adler et al., 2009) and influenced by self-citations (Hirsch, 2005; Vinkler, 2007).

From the above paragraph & discussion it is clear that there are so

many drawbacks of h-index and thus various researchers have presented the modified form of the h-index known as h-index variants to overcome those drawbacks such as the g index given by Egghe (2006), h (2) index given by Kosmulski (2006), a index given by Jin (2006) and the r index given by Jin et al. (2007) etc. The brief information of all of these variants is provided in Table 1.

The objective of the analysis in this study is to examine empirically that whether the development of these variants of the h index really measures the researchers' productivity and in how many categories in the field of RFID and SCM. From the literature, it was found that h-index and its variants can be categorized in two categories/factors (Bornmann et al., 2008). Bornmann et al. (2008), define these categories as one which is based on a number of papers while the other one is based on the impact of those papers of individual authors. Furthermore, they explained that h-index and g-index belong to the first category, while A-index and R-index belong to the second. Thus, our objective in this paper is to conduct a thorough validation of these results to know the generalization of the Bornmann et al. (2008) results through using the different data set as well as the different field of a research study.

Table 1: h-Index and its variants

Index	Definition
h-index	"A scientist has index h if h of his or her N_p papers have at least h citations each and the other ($N_p - h$) papers have fewer than h citations each" (Hirsch, 2005, p. 16569)
g-index	"The highest number g of papers that together received g^2 or more citations" (Egghe, 2006b)
h(2) index	"A scientist's h(2) index is defined as the highest natural number such that his h(2) most-cited papers received each at least $[h(2)]^2$ citations" (Kosmulski, 2006, p. 4)
a-index	It is defined as the average number of citations of papers in the Hirsch core. The proposal to use this average number of citations as a variant of the h index was made by Jin, the main editor of Science Focus (Jin, 2006). Rousseau (2006) referred to this index later as the a-index.
r-index	It is defined as the square root of the sum of citations in the Hirsch core. Jin et al. (2007) refer to this new index as the r index, as it is calculated using a square root. According to Burrell (2007) "the h-index seeks to identify the most productive core of an author's output in terms of most received citations" (p. 170). For this core, consisting of the first h papers, Rousseau (2006) introduced the term Hirsch core.
Hirsch core	

(Source: compiled by authors from the literature)

In the current article, we validate the previous analysis of Bornmann et al. (2008), by employing Factor Analysis using a bigger data set from different field and consisting of only five variants of h-index together with a number of publications and number of citations. This analysis clarifies the characteristics and behavior of the h-index variants and resulted in valid factors through exploratory factor analysis.

Research Methodology

The articles were collected from the Scopus database since 1999 to 2015 in the month of May 2016. The main reason for limiting the search to Scopus is that it is the largest abstract and citation database and includes over 20,000 peer-reviewed journals in the fields of technology, science, medicine, social sciences, and arts and humanities (Fahimnia, 2015). In this study, the query keywords "supply chain management" AND "RFID", "supply chain management" AND "Radio frequency identifications" were used to download the articles. All kind of duplicity and conference papers, Articles in press, book series and trade publications have been discarded to maintain the quality of research work. The document type is being selected articles only to maintain the quality publications. The final dataset included 631 articles contributed by 1399 researchers for this study.

We used the direct count method for counting the number of articles as well as the citations for an individual author. We used Google Scholar for recording citations because Google Scholar presents a complete picture of an academic's impact. According to Smith (2008), who compared citation counts from Google Scholar to the research output from universities under New Zealand's PBRF (Performance Based Research Funding) research assessment exercise and found a very high (0.94) correlation between the PBRF output and the total number of citations returned by Google Scholar. All of the five variants along with a number of publications and number of citations that were included in the present study were calculated for the all 1399 researchers as per definitions are given in

Table 1.

Table 2 shows the descriptive statistics for all the 1399 authors. From the table 2, it is clear that the h index values for the authors lie between 0 and 8. The mean and the standard deviation of the h index values are 1.03 and .796, and the median has a value of 1. According to Liu and Rousseau (2007), the mean (m) of h index should be larger than the mean of h (2) index and smaller than the mean of g index. Thus, these values are accordingly and satisfied the criteria. Although a high number of authors published only a single article, some of the articles were highly cited, so that the mean a- index and r- index values depart very strongly from the mean h index value, as shown in table 2.

Table 2: Descriptive Statistics

Index	N	Minimum	Maximum	Mean	Std. Deviation	Mdn
h index	1399	0.00	8.00	1.0322	.79679	1
g index	1399	0.00	11.00	1.1244	1.04216	1
h(2) index	1399	0.00	5.00	.9750	.63185	1
a index	1399	0.00	469.00	31.6183	58.43608	12
r index	1399	0.00	23.35	4.5920	4.37596	3.61

Analysis & Discussion

Using an exploratory factor analysis, we tried to find the dimensions or factors that indicate how the seven variables of research productivity categorize in few factors. Principal component factor analysis was done to identify the factors and helps in determining research productivity in the field of RFID and Supply Chain Management. We used a rotated VARIMAX-transformation to make the matrix more easily interpretable. Data were analyzed using SPSS 20 software. The test of the validity of data was examined with the help of a Kaiser- Meyer-Ohlin (KMO) measure of sample adequacy and Barlett's test of sphericity. These two tests satisfied the validity of data for factor analysis and shown in Table 3.

Table 3: Kaiser-Meyer-Ohlin(KMO) Measure and Bartlett's Test

KMO Measure for Adequacy of sampling	.732	
Bartlett's Test of Sphericity	Approx. Chi square	33433.386
	Df	21
	Sig.	.000

For reliability test, Cronbach Alpha has been computed. Cronbach's alpha determines the internal consistency or average correlation of items of this study to gauge its reliability. The value of Cronbach's alpha resulted in .818 which is good considering that .70 is the cut-off value for being acceptable (Cronbach, 1951). Furthermore, Cronbach's alpha value for individual items also determined as depicted in Table4 and all are having above .70 and it is in the range of acceptable threshold value. To determine the number of factors, only the Eigen values greater than or equal to 1 were considered (Guttman 1954; Kaiser 1974). The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is an index used to examine the appropriateness of factor analysis. High values (between 0.5 and 1.0) indicate factor analysis is appropriate (Leech et al., 2005, Hair et al., 2005). EFA gave a value of 0.732 for the Kaiser –Meyer-Olkin (KMO) measure of sample adequacy (Kaiser, 1974), indicating the suitability for the factor analysis. The factor analysis resulted in two factors— quantity dimension of the productivity and quality dimension of the productivity which together accounts for 95.58 Percent of the total variance i.e. information contained in the seven elements. These two factors are having Eigen values greater than 1 and, thus these are considered significant. The factor loading of the variables determining productivity in each factor is shown in Table4. These results provide statistical evidence to support identified factors of researcher's productivity.

Factor 1 (Quantity Dimension of the productivity): The most important factor determining research productivity in the field of RFID and SCM was found to be quantity dimension of the productivity since the eigen value and percent of variation explained by this factor

are 4.52 and 52.75. This factor consists of four variables. i.e. No of articles, h-index, g-index, h(2). The percent variation explained by this factor is 52.75 percent. This is also supported by the previous studies (Bornmann et al., 2008; Schreiber et al., 2012).

Table 4: Factor Loading of Variables

Factor	Variables	Factor Loading	Eigen value	Cronbach Alpha	Variance (%)
Quantity Dimension of the productivity	No of articles	.943	4.52	.821	52.75
	h-index	.958		.821	
	g-index	.959		.817	
	h(2) index	.924		.823	
Quality Dimension of the productivity	No of citations	.973	2.17	.720	42.84
	a-index	.998		.742	
	r-index	.973		.729	

Factor 2 (Quality Dimension of the productivity): The second important factor identified is a quality dimension of the productivity. The respective eigen value is 2.17. This factor consists of three variables as no of citations, a-index, and r-index. The percent variation explained by this factor is 42.84. Our results are in conformance with the previous studies (Bornmann et al., 2008, Schreiber et al., 2012)

The last step in the factor analysis is to determine the fitness of the factor analysis. For a suitable factor analysis, the difference between the reproduced and observed correlation should be small i.e. less than 0.05. This has been achieved by generating reproduced matrix and residuals are computed between observed and reproduced correlations. There are 2 (9.0%) non-redundant residuals with absolute values greater than 0.05 which indicates the suitability of the factor analysis.

Testing the composite reliability and Average variance extracted for both the factors

Now in this section, we tried to find out that whether factor analysis is interpreted in a correct way or not. This is necessary to examine because if a factor analysis is wrongly interpreted and failed to establish the discriminant validity than any kind of conclusions made regarding relationships between factors under investigation may be considered wrong. Thus, it is necessary to establish the discriminant validity. Discriminant validity means that a latent variable is able to account for more variance in the observed variables associated with it. If this is not the case, then the validity of the individual indicators and of the construct is not considered valid (Fornell and Larcker, 1981).

Discriminant validity is examined by the use of AVE as suggested by Fornell and Larcker (1981). Discriminant validity indicates that how well a given construct is different from other constructs

(Hulland, 1999). For adequate discriminant validity, the AVE shared on itself should be higher than variance shared with other constructs (Chin, 1998). Shared variance is the amount of variance that a factor is able to explain in another factor. It is obtained by the square of the correlation between any two factors. The AVE of constructs shows the average of variances of the observed variables to which it is theoretically related. When this variance is averaged across all observed variables that relate theoretically to a latent construct, we generate the AVE (Farrell, 2009).

Fornell and Larcker (1981) presented how to determine the discriminant validity of two or more factors. Here, a researcher compares the AVE of each factor with the shared variance between factors. If the AVE for each factor is greater than its shared variance with another factor, discriminant validity is established.

Table 5: Average loading, Variance extracted and correlation of factors

Factors	Average Loading	Variance extracted	Correlation
Quantity Dimension of the productive core	.946	.895	.336
Quality Dimension of the productive core	.981	.962	

In our study Average Loading for 1st factor is .946 Average Loading for the second Factor is .981 Variance extracted is square of loading which is the first factor is .895 and for second factor it is .962 Thus the average variance extracted for two factors is equal to $(.895 + .962)/2 = .928$ correlation between two factors is .336, the square of this is .113 Since Variance extracted is > correlation square and thus discriminant validity

established. Since loading is above .7 thus convergent validity also established.

Table 6: Quality Dimension of the productivity

AUTHORS PRODUCTIVITY			AVE	Composite Reliability
Λ	λ^2	$1-\lambda^2$		
0.943	0.889249	0.110751		
0.958	0.917764	0.082236	0.895	0.971
0.959	0.919681	0.080319		
0.924	0.853776	0.146224		

From the table 6, the composite reliability for above factor is calculated as .97 while average variance extracted for this is .895. Composite reliabilities of .7 or higher are considered good. Average variance varies from 0 to 1. An AVE greater than .5 indicates satisfactory convergent validity. Thus for the quantity dimension, both the values are satisfactory.

Table 7: Quality Dimension of the productivity

Λ	λ^2	$1-\lambda^2$	AVE	Composite Reliability
0.973	0.946729	0.053271		
0.998	0.996004	0.003996	0.963	0.987
0.973	0.946729	0.053271		

From Table 7, composite reliability is calculated as .98 while average variance extracted for this is 0.96. Composite reliabilities of .7 or higher are considered good. Average variance varies from 0 to 1. An AVE greater than 0.5 indicates satisfactory convergent validity. Thus, for the quality dimension, both the values are satisfactory.

Conclusion

This paper presented the applicability of the h-index and its variants to measure the researcher's productivity using exploratory factor analysis. Authors have taken a large sample size from the field of RFID & SCM with five of the variants of h-index along with a number of publications and number of citations. The authors examined empirically that whether there is a possibility of dividing the variants into two factors of research productivity namely the quality and quantity dimension of research output. From the factor analysis, it has been found that all the seven variables (variants) grouped in two factors. These findings are in conformance with the past study conducted by Bornmann et al. (2008). From the result, there are variants having

a stronger tendency to describe the quantity dimension of the productivity. Among these are h-index, g-index, h (2) index and a number of articles. In the same manner, for other variants, there is a stronger tendency to describe the impact of the productivity, including No of citations, a-index, and r-index. These results also supported by the previous study made by Bornmann et al. (2008). Nevertheless, the present investigation validates the results derived by Bornmann et al. (2008), by generalizing the findings obtained.

In this study, authors started the analysis with the h-index and four of its variants and got a clear distinction in factor analysis results. Factor analysis gives two factors only. These two factors are named as Quantity dimension of the productivity and Quality dimension of the productivity. The variants in the first factor are more related with the number of publications, while the second-factor variants are more correlated with the impact and impact is being measured by the number of citations. Furthermore, authors have determined the fitness of the factor analysis by generating reproduced matrix and residuals between observed and reproduced correlations and found that there are 2 (9.0%) non-redundant residuals with absolute values greater than 0.05 which indicates the suitability of the factor analysis. In the end, authors tested the discriminant validity and convergent validity to see whether factor analysis is interpreted rightly or not. From the analysis, it has been established. Thus, the results of this study are valid and can be generalized for the other fields of the study for researchers' productivity measurement.

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An Empirical Study on Strategic Assessment of Lean and Six Sigma Implementation In Indian Health Care Industry: Searching For The Sandcone



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Abstract

Ever since Motorola gave birth to Six Sigma (6σ) in the late 1980s, the concept has been implemented worldwide in firms striving for quality improvement in their business processes. Six Sigma is defined as a program designed to reduce “the number of defects [in a process] to as low as 3.4 parts per million opportunities” (Henderson and Evans, 2000). To put it simply, Six Sigma uses statistical methods to achieve an almost defect-free process. If the distance between the mean of a process and the closest specification limit (a boundary set by the customer) is six standard deviation units, then the process is considered a “six sigma process.” Six Sigma could be applied to these departments without making drastic internal adjustments because of their data-rich, process-oriented environments. It examines why this phenomenon occurs. It does so by interviews and surveys of senior health care professionals who oversee multiple Strategic Business Units (SBUs). The interview and survey results are consistent with one another and point to the importance of the “mentality” of hospitals' management and workforce: how they think about the health factory and its operations. The nature of that mentality is explored.

Keywords: Six Sigma, Variable Performance of Strategic Business Units (SBUs), Critical Success Factors (CSFs), Operations Management, and Health Care Industry.

Introduction

Six Sigma takes away the “gut feeling” approach that is too often used in managerial decision-making and replaces it with business decisions based on cold, hard data. In other words, Six Sigma is a process used to improve a process. Although there is

not a set formula for Six Sigma deployment (it varies across companies and industries), the traditional system used by Six Sigma professionals to carry out Six Sigma assignments is called DMAIC (**D**efine, **M**easure, **A**nalyze, **I**mprove, **C**ontrol). These represent the five stages of a typical Six Sigma project: (1) *Define* the problem, (2) *Measure* the process by gathering data, (3) *Analyze* the data and look for any cause-effect relationships by paying close attention to key variables (Six Sigma thinking revolves around the equation $Y = f(x)$), (4) *Improve* the process by using the results of the data analysis as a guideline, (5) *Control* the process through regular monitoring; a control plan should be developed in case the problem reoccurs (Creveling et al., 2006, 9-10). A “roadmap” of the DMAIC process is provided in the following flow chart and provides further details on each stage. The chart below is a visual representation of how DMAIC is applied to a Six Sigma project. The process itself is very strict, as the project status has to pass a “tollgate” at the end of each stage. For example, after the “Define” stage of the project is complete, the project manager presents the results to the process director who in turn gives a “go” or “no go” signal to either continue with the “Measure” phase or backtrack (Galloway, 2007).

The DMAIC approach is very similar to the modern Stage-Gate process, where projects are strategically selected and must pass a “test” at each gate in order to be eligible to jump to the next project stage (Cooper et al., 2002). As mentioned previously, managers strive to achieve the ideal sigma level of 6, however this is rarely accomplished. Figure 2 provided by New Page Corporation explains this concept visually using specific industry examples.

Figure 1: DMAIC approach

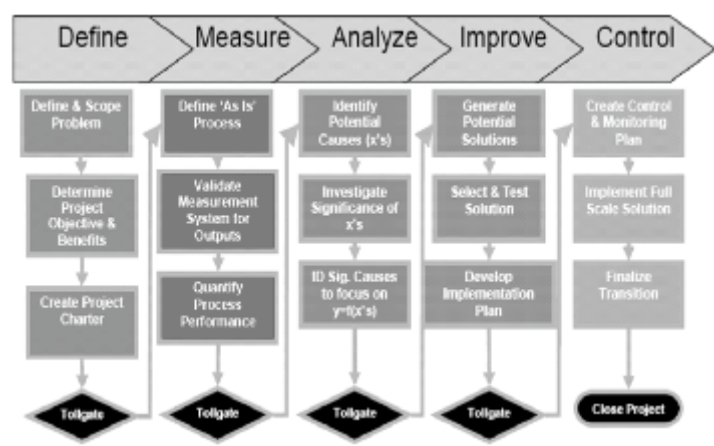
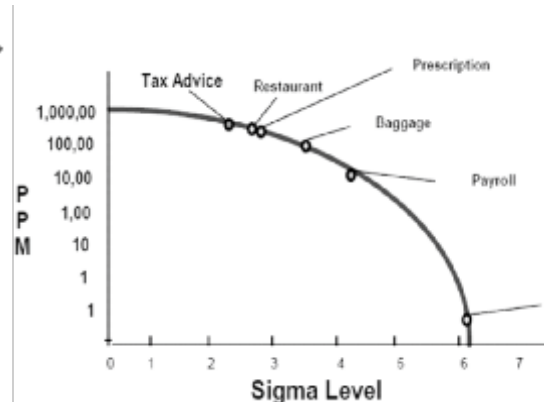


Figure 2



The figure shows that there are large discrepancies in sigma levels according to the industry. The x-axis represents the sigma level and the y-axis represents the defective parts per million opportunities (PPM). The airline industry, for example, requires a six sigma level process; otherwise flying would no longer be a reliable option for transportation. Unfortunately, other business processes such as the shipping of luggage from one airport to the next (luggage is often lost or sent to the wrong destination) and medicine prescriptions (doctors often have sloppy handwriting which is interpreted incorrectly by the pharmacist) hover around the 3 sigma level. To put it simply, at a 3 sigma level, about 60,000 out of every 1 million suitcases are delivered late, to the wrong destination, or lost.

Figure 3 (Exhibit A): VOC matrix

[illegible]

(Source: www.qimacros.com)

The quality and efficiency of manufacturing and services have been greatly improved through continuous improvement methodologies such as Lean and Six Sigma over the last 25 years or so (Antony et al., 2012; McAdam et al., 2011; Lindsay and Kumar, 2012). However the applications of such methodologies in the healthcare industry are in their infancy stages in many countries including the developing countries like India (Lindsay and Kumar, 2012). Moreover there is substantial evidence in the application of both Lean and Six Sigma from manufacturing sector; however, there is limited empirical evidence in the current literature demonstrating the applications of these methodologies within Government and Private Corporate Hospitals (GPCHs), India. A recent study carried out by the American Society for Quality (ASQ) has shown that the correlation between deployment of Lean and Six Sigma within 77 hospitals and improved clinical outcomes and financial performance appeared equivocal (ASQ, Lean Six Sigma Hospital Study Advisory Committee, 2009). The study has also revealed that a high percentage of hospitals, especially without Lean or Six Sigma deployments, do not track common operational metrics (length of stay and patient complaints, for example) and financial metrics (cost per patient for example).

Figure 4 (Exhibit B): FMEA matrix

Potential Failure Modes and Effects Analysis															
System _____										FMEA Revision _____					
Subsystem _____										FMEA Prepared By _____					
Part Number _____										FMEA Date _____					
Designer _____										FMEA Revision Date _____					
Item/ Function	Potential Failure Modes	Failure Mode Effects	S E V	Potential Failure Causes	P F	Current Controls	D E T	R P N	Actions Req'd	Owner/ Target Date	Actions Taken	S E V 2	P F 2	D E T 2	R P N 2

(Source: www.siliconfareast.com)

Although the authors have identified over 200 papers relevant to Lean and Six Sigma in Healthcare, it was found that the current focus on evidence-based management to improve quality in healthcare cautions that current trends in evidence-based management are largely based on conceptual arguments and there are very few empirical studies carried out to understand the benefits of Lean and Six Sigma methodologies to improve clinical outcomes, patient safety, efficiency and financial performance. The purpose of this research was to examine the role that Lean and Six Sigma have within Indian Health Care Sector to improve the efficiency and performance of the organization and the care provided to its patients. The study involved collecting data from a survey questionnaire distributed to various hospitals in India followed by a number of semi-structured interviews with people who were involved in the use of Lean and Six Sigma methodologies in the Indian Health Care Sector. The remainder of the paper is structured as follows: First, a literature review on Lean and Six Sigma with a greater focus on empirical studies carried out by other authors in the context of healthcare, followed by the research methodology used for the research, a report on key findings and finally my conclusion and agenda for future research.

Survey of Related Literature

Both Lean and Six Sigma are two powerful methodologies for improving the efficiency and effectiveness of healthcare processes. Lean is based on long-held practices advanced by the Toyota Motor Corp. with an emphasis on removing waste from organizations while focusing on and delivering more value to customers. Six Sigma, coined by Motorola Corporation, focuses on the application of powerful statistical methods to understand, quantify and reduce process variation (Kumar et al., 2011). The purpose of Lean Thinking

in healthcare is to create an environment for improving flow and eliminating waste. Six Sigma on the other hand, helps to identify and quantify problems that are related to variation in processes. Both are powerful strategies to focus efforts in the areas that offer the most potential improvement. Despite their disparate roots, it is quite clear that Lean and Six Sigma encompass many common features such as an emphasis on customer satisfaction, a culture of continuous improvement, comprehensive employee involvement and search for root causes. Lean always asks the question, "Why does this process exist at all? What is the value and the value stream?". Six Sigma starts with "How can we improve this process?" It does not ask "Why does it exist at all?" (Antony and Banuelas, 2001). The following are some of the commonalities and fundamental differences between Lean and Sigma methodologies (Kumar et al., 2006; Dahlgaard and Dahlgaard-Park, 2006; Snee, 2010).

Commonalities include

- Both are continuous business process improvement methodologies.
- Both focus on business needs defined by the customer.
- Both are practical methods, proven to work in many organizations.
- Both involve a comprehensive toolkit for tackling process related problems.

Fundamental and critical differences include

- Lean is primarily good for quick and initial round of improvements whereas Six Sigma is suitable for long-term and complex problems where the solutions are either unknown or vaguely known.
- Lean requires low investment due to the nature of the training and the skills to be developed as a result of this training whereas Six Sigma demands high investment and is not suitable for fixing common sense problems in the business.
- Lean has less emphasis on statistical tools and techniques whereas Six Sigma requires the use of applied statistical methods for understanding and reducing variation in processes.
- No formal organizational infrastructure for Lean implementation and deployment whereas Six Sigma has a well defined organizational infrastructure (yellow belts, green belts, black belts, master black belts, deployment champions and sponsors in some cases).
- Lean looks into mapping of end to end process and uses value

stream exercises to understand the interactions between processes whereas system interaction between processes is not considered in a typical Six Sigma problem solving scenario and this would possibly sub-optimize the overall process performance.

According to George (2002), Six Sigma does not directly address process speed and so the lack of improvement in lead time in companies applying Six Sigma methods alone is understandable. These companies also generally achieve modest improvement in Work in Process (WIP) and finished goods inventory turns. In a similar manner, those companies engaged in Lean methodology alone show limited improvements across the organization due to the absence of Six Sigma organizational infrastructure. In essence, an integrated approach utilizing the best of Six Sigma and Lean Strategies will maximize shareholder value by accomplishing dramatic improvements in customer satisfaction, cost, quality, speed and invested capital. The companies practicing the integrated approach will gain four major benefits (George, 2002): Become faster and more responsive to customers; strive for Six Sigma capability level; operate at lowest costs of poor quality; and achieve greater flexibility throughout the business. In the case of a patient visiting a medical facility, it is important that the patient receives due attention at the earliest possibility in a predetermined flow. If one were implementing Lean Thinking alone, the solution could lead to very fast process in a flow, but a dissatisfied patient due to lack of attention from a physician. If one were implementing Six Sigma alone, the patient will have a great visit, but the medical facility may not be able to keep up with a required number of patients in order to be a financially viable organization. According to Bisgaard and De Mast (Bisgaard and De Mast, 2006), an integrated framework for Lean Six Sigma consists of the following elements:

- A structured approach – the deployment infrastructure is based on a task force consisting of champions, Black belts and Green Belts.
- Project-based deployment – projects are classified as either "quick wins" (Lean) or "advanced" (Six Sigma). Lean projects are applied to problems associated with inventory, lead time reduction, and processing time. Typical Six Sigma projects involve problems associated with quality, defect reduction, variability reduction, yield improvement, etc.
- Organizational anchoring of solutions – to secure the implementation of solutions and guard against backsliding, tasks and responsibilities are clearly defined, procedures are standardized, etc.

- Linking project selection with business strategy – It is important to ensure that projects are aligned with the overall strategic objectives of the business

Delli Fraine and Langabeer (2010) assessed the evidence of Six Sigma and Lean in the Healthcare Industry. They have conducted a structured systematic review of articles on the use of Lean and Six Sigma in healthcare settings that were published between 1999 and 2009. Of the 177 studies published during the 10 year period, it was interesting to note that 70% were related to Six Sigma, 23% were related to Lean and 7% were related to both Lean and Six Sigma. The authors found that the level of evidence supporting a positive relationship between the use of Lean/ Six Sigma and performance improvement was weak. They also found that most studies focused on Lean / Six Sigma to improve processes of care, while few studies focused on Six Sigma/Lean to improve clinical outcomes. The authors also found limited literature on the failures of Lean/Six Sigma. The study carried out by the ASQ Lean Six Sigma Hospital Study Advisory Committee (ASQ, 2009) showed the level of adoption of Lean or Six Sigma practices at US Hospitals. The inability to sustain improvement was cited as one of the greatest challenges to successful deployment of both Lean and Six Sigma deployments.

Other challenges include: competition from other initiatives, leadership commitment, availability of resources, motivating employees, expertise and skills, etc. The study also demonstrated that a majority of hospitals participated at the study have applied the following specific tools and techniques of Lean and Six Sigma: Value-stream mapping, 5S, Pareto analysis, Failure Mode and Effect Analysis, Statistical Process Control, Five whys, Seven or Eight Forms of waste, and Visual management. Feng and Manuel (2008) present the results from a national survey of Six Sigma program in US Healthcare organizations. A total of 56 hospitals responded to this survey of which 15 hospitals are practicing Six Sigma while 41 are non-Six Sigma organizations. Most of the Six Sigma organizations have implemented the program for less than four years, which suggests that Six Sigma program is still in its infancy stage in healthcare organizations. The authors also found that the lack of commitment from leadership is the major resistance or barrier for the successful implementation of Six Sigma. The types of projects performed within the healthcare organizations were focused on three categories: Cycle time reduction, process flow improvement; and medical-error reduction Grove et al. (2010) presented the fundamental challenges identified during a lean implementation in a health visiting service within a large primary

care trust in NHS, UK. The authors have utilized a triangulated approach for data collection which included semi-structured interviews, document analysis and participant observation. The challenges to lean transformation from this study were: *lack of understanding of what Lean is all about; poor communication; poor leadership; high process variability; determining who the customer is and what do they value?; high process variability, and so on.* The authors also argued that if hospitals wish to deliver world-class healthcare in the face of constrained resources and greater demand, they need to develop a long-term vision and world-class leadership to sustain the initiative and get Lean embedded into the DNA of the healthcare organizations. De Souza and Pidd (2011) in their study explored the barriers to Lean healthcare based on experience of applying Lean thinking in the UK's NHS. The authors concluded that many of the barriers are people-based or organizational apart from inappropriate jargon and a worry that people will be treated like widgets. Perception that Lean is primarily meant for manufacturing can also be a major barrier to Lean implementation. The authors also observed that functional and professional silos are seen as a major barrier to Lean implementation.

Research Methodology

The fundamental purpose of this study was to “examine the extent to which Lean and Six Sigma methodologies are being implemented within Indian Health Care Sector”. In order to do this effectively, the general objectives were further divided into a number of specific research questions as follows.

- *What is the current status for the use of Lean and Six Sigma in Indian Health Care Sector?*
- *To what extent are the Indian Health Care Sector familiar with the tools and techniques of Lean and Six Sigma?*
- *What benefits have been brought to the Indian Health Care Sector through Lean and Six Sigma strategies?*
- *What are the Critical Success Factors (CSFs) for implementation of Lean and Six Sigma with Indian Health Care Sector?*
- *What are the common barriers in the implementation of Lean and Six Sigma methodologies in Indian Health Care Sector?*

In order to achieve the research objectives, a survey questionnaire was initially constructed drawing upon prior literature. Given majority of the research questions are 'What' type questions, an exploratory survey research strategy was adopted for data collection (Saunders et al., 2010; Yin, 2009). Survey is perhaps the dominant form of data collection in the social

sciences, providing for efficient collection of data over broad populations, amenable to administration in person, by telephone, or over the Internet (Easterby-Smith et al. 2008, Saunders et al. 2010, Fowler 2002). Survey questionnaire will allow for the largest amount of data and the most thorough amount of data that can be collected within the boundaries of this study (Fowler, 2002). Survey questionnaire was first pilot tested with ten participants from GPCHs and Academics. Based on their comments, five questions were dropped and other eight questions were reworded. A Likert scale of 1-5 was used for critical success factors and tools & techniques section of the questionnaire. The final questionnaire was mailed out to 800 people in various regions of the Government and Private Corporate Hospitals (GPCHs) in India. Of the 800 questionnaires mailed, 90 completed questionnaires across 18 Strategic Business Units (SBUs) were returned. This represented a response rate of over 11%, which was rather regarded as satisfactory (Saunders et al., 2010). A total of 12 responses were not useable due to incomplete data. This resulted to only 78 completed questionnaires used in the final analysis of this paper. Table 1 presents the breakdown of respondents who have completed the questionnaire.

Table 1 :Breakdown of respondents to the survey questionnaire

RESPONDENTS (TYPE)	FREQUENCY
Medical Directors	12
Nurses	14
Medical Doctors	6
Clinical Governance Managers	15
Chief Executives	5
Quality Improvement Managers	11
Patient Safety Officers	4
Lean Champions	4
Accountants	4
Others	3
TOTAL	78

Findings From the Survey

a. Current Status of Lean and Six Sigma

The first part of the investigation was to understand the current quality and process improvement related initiatives utilized by the

Indian Health Care Sector. It was found that a number of hospitals are using Kaizen related activities as part of process improvement. Moreover the researcher also found that although Lean has been embraced by a number of GPCHs in India. However there was a clear lack of evidence in the use of Lean thinking to change the culture of a particular GPCHs. For many hospitals, we felt that Six Sigma is still new as they are currently tackling several quick-win projects across many hospitals. As expected, ISO 9001 is the main quality improvement initiative being implemented by the Health Service Executives in many hospitals. Lean has been used for tackling following types of projects in various hospitals, e.g. waiting time reduction in A & E; length of stay in A & E; throughput of operating theatres; turnaround times at the operation theatres; improved patient flow across the hospital (i.e., streamline cycle from referral to admission); improved discharge management; and improved patient safety and patient satisfaction. The issue of the key indicators that comes into play when prioritizing Lean/Six Sigma projects within the hospitals resulted in many more responses. In terms of the key indicators patient requirements was reported to be important or very important by many of the respondents. At the same time, poorly performing areas in the organization and multi-disciplinary projects were also indicated as being important indicators for Lean efforts. It was also noted that many participating hospitals (approximately 70%) using Lean have had an experience of between 2 and 5. About 20% of hospitals have been using Lean between 5 and 7 years and 10% hospitals have been practicing Lean for over 8 years. Moreover it was interesting to observe that less than 5% of participating hospitals are using Six Sigma methodology for tackling process variability problems in the hospitals.

b. Tools and Techniques of Lean and Six Sigma

One of the success factors of both Lean and Six Sigma are their ability to use the toolbox in a systematic and disciplined manner. Table 2 illustrates the most commonly used tools and techniques of Lean and Six Sigma within the GPCHs, India. Respondents were asked to rate the application of Lean and Six Sigma tools and techniques (i.e., usage) on a Likert Scale of 1 to 5, where '1' indicates 'never been used' and '5' indicates 'used continuously'. Similarly, the degree of perceived usefulness was also rated on a scale of 1 to 5, where '1' implies 'not useful' and five implies 'extremely useful'. As can be seen from the Table 2, the least commonly used tools and techniques of Lean/Six Sigma toolbox include: Quality Function Deployment (QFD), Mistake Proofing, SMED, Design FMEA, Process FMEA, Total Productive

Maintenance (TPM), Non-Parametric tests, etc. The top five popular tools and techniques of Lean/Six Sigma toolbox include Benchmarking, Brainstorming, Patient Feedback, Process Mapping and Root Cause Analysis.

Table 2: Most commonly and least commonly used tools & techniques of Lean and Six Sigma

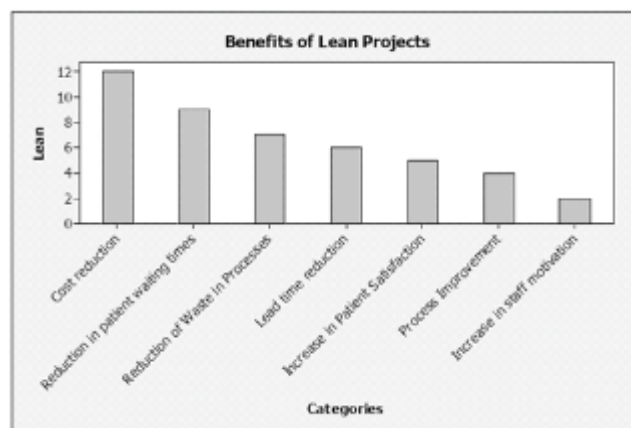
Tools/Techniques	Usage (Mean)	Usefulness (Mean)
Brain storming	4	3.51
Benchmarking	3.93	3.44
Process Mapping	3.77	3.70
Patient Feedback	3.51	3.14
Cause and Effect	3.42	2.56
Scatter Diagram	2.93	1.79
Hypothesis Testing	2.26	1.93
Tally Charts	1.95	1.72
Regression Analysis	1.93	1.77
Pareto Diagram	0.77	0.67
Histogram	0.65	0.42
Quality Costing	0.49	0
Control Chart/Run Chart	0.32	0.45
5s practice	0.16	0.28
SIPOC	0.14	0.16
Value Stream Mapping	0.09	0.21
Error Proofing	0.02	0.09
Quality Function Deployment (QFD)	0	0
Setup Time Reduction (SMED)	0	0.04
Failure Mode & Effect Analysis (FMEA)	0	0
Non-Parametric Tests (Man-WhitneyTest)	0	0
Total Productive Maintenance (TPM)	0	0

c. Key Benefits of Lean and Six Sigma

As the success of Lean and Six Sigma initiatives are focused on the project execution, it was important to understand the areas where the projects are carried out across the participating hospitals. Figure 1 shows the typical benefits of Lean projects carried out across 18 SBUs. The areas that have experienced the greatest benefits are reduction in operational costs, reduction in patient waiting times, waste reduction in processes and so on. From the 18 GPCHs, we found that over 40 projects were Lean related and about 8 were Six Sigma related. The Six Sigma related projects were focused on reducing the number of medication

errors, reducing MRI examination time, pathology laboratory turnaround time, X-ray film defects, etc.

Figure 5: Typical benefits of Lean projects from the participating hospitals



d. Critical Success Factors (CSFs) for the successful implementation of Lean and Six Sigma Strategies in Indian Health Care Sector

The idea of identifying the CSFs as a basis for determining the information needs of managers was popularized by Rockart (Rockart, 1979). In the context of Lean and Six Sigma methodologies, CSFs represent the essential ingredients without which the initiative stands little chance of success. The leaders of health care industry should consider the application of Lean and Six Sigma from the perspective of improving the flow, quality and capability of current processes as well as the ability of processes to deliver patient care and safety tomorrow. The following CSFs were perceived to be essential for the successful development and deployment of both Lean and Six Sigma initiatives in Indian Health Care Sector. The respondents were asked to rank the CSFs identified from the existing literature on a scale of 1 to 5 (1 = least important, 2 = less important, 3 = important, 4 = very important and 5 = crucial). The CSFs used in this study were derived from existing literature of TQM and Six Sigma (Adams et al., 2003; Antony and Banuelas, 2002; Antony et al., 2008; Antony et al., 2007; Hilton et al., 2008; Timans et al., 2011; Yusof and Aspinwall, 1999; Badri et al., 1995; Black and Porter, 1996). Table 3 illustrates the CSFs which are essential for the successful introduction of Lean and Six Sigma initiatives in Indian Health Care Sector.

Table 3: CSFs for Successful introduction of Lean and Six Sigma

Critical Success Factors (CSFs)	Importance	Practice
Focusing on the needs of patients	5.00	3.93
Senior management commitment and involvement	4.91	4.56
Strong leadership to continuous improvement processes demonstrated by managers at all levels	4.86	3.42
Establishing measurement and feedback systems	4.58	3.91
Appointing a Project Champion/Facilitator	4.53	3.65
Establishing a culture for continuous improvement	4.51	4.02
Integrating continuous improvement activities interdisciplinary teams and at all levels	4.49	3.19
Focusing on critical processes	4.33	4.21
Focusing on employees	4.33	4.21
Communication with employees	3.95	3.58
Project Management (good project planning, project tracking, reviews, etc.)	3.91	3.40
Learning from continuous improvement results automatic capturing and sharing of learning	3.72	3.28
Including best practice/gold standard achievements documented quality management system	3.65	2.84
Organization infrastructure (ex: project champions)	3.60	2.91
Understanding methods, tools and techniques, etc	3.47	3.00
Willingness to take risks	3.44	3.12
Linking Lean/Six sigma to business strategy, government targets and financial indicators.	3.14	1.77
Training in Lean/Six Sigma	3.23	2.83

Table 3 illustrates the list of Critical Success Factors (CSFs) in terms of importance (this means expected importance of a factor according to people who had participated in the survey) and practice (experienced or perceived importance for a factor). The top five important factors (from a list of 18 factors identified from the literature) perceived by the hospitals based on the study were:

- Senior management commitment and involvement
- Focusing on critical processes for improvement
- Establishing a culture for continuous improvement
- Focusing on the needs of patients
- Establishing measurement and feedback systems

The least important factors perceived by the participating hospitals were:

- Linking Lean / Six Sigma to business strategy, Government targets, etc.
- Training in Lean / Six Sigma
- Including best practice / gold standard achievements in a documented quality management system
- Organizational infrastructure for Lean/Six Sigma program (e.g.:

project champions)

- Understanding methods, tools, techniques, etc. within Lean/Six Sigma (when, where, why, what, how?)

It was very interesting to observe that projects were not selected by critically looking into its alignment with strategic objectives of hospitals or government targets. Moreover, there was very little attention paid to training program related to methodology, tools and techniques of Lean and Six Sigma for solving process and quality problems. It was also found that many hospitals did not have a Lean or Continuous Improvement champion to identify, monitor and review the progress of continuous improvement projects. The authors noticed that the participating hospitals did not have a model or roadmap for sustaining the Lean initiative which is absolutely essential in our opinion for embedding Lean/Six Sigma practices into the culture of Indian Health Care Sector.

e. Common Barriers in the successful implementation of Lean and Six Sigma Strategies in Indian Health Care Sector

There are several barriers and challenges lurking below the surface for health care industry for consideration before the

implementation and deployment of Six Sigma business strategy. The respondents were asked to mark the five barriers that they thought were the most important in terms of implementing Lean and Six Sigma. The top five barriers identified for both Lean initiative and Six Sigma initiative are shown in Figure 2 and 3. For Lean initiative, culture and resistance to change was considered as the most important barrier whereas availability of resources and time was deemed to be the most important barrier to the Six Sigma initiative.

The cultural issues of GPCHs are somewhat very difficult to change overnight. However the author believes the starting point for initiatives such as Lean Six Sigma is to execute a one day Workshop covering management aspects of Six Sigma and some of the key challenges in the context of Healthcare while implementing such an initiative. Availability of resources and time are always an excuse for many public sector organizations. In order to minimize the budget and resources, it is best to train about 5 to 10 top talented people in the organization in the first wave of training. The focus must be on the execution of projects and selection of projects which are aligned with strategic business objectives or government targets. In GPCHs, it appears that there is clear lack of leadership and strategic vision with regard to continuous business improvement methodologies. The respondents have ranked high on poor training or coaching as one of the common barriers in the execution of Lean and Six Sigma strategy in GPCHs.

Figure 6: Barriers to implementation of Lean

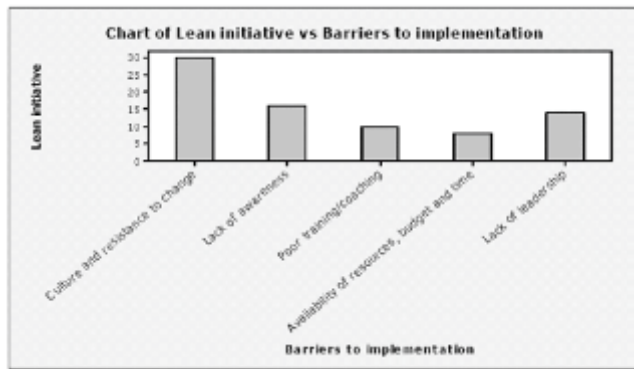
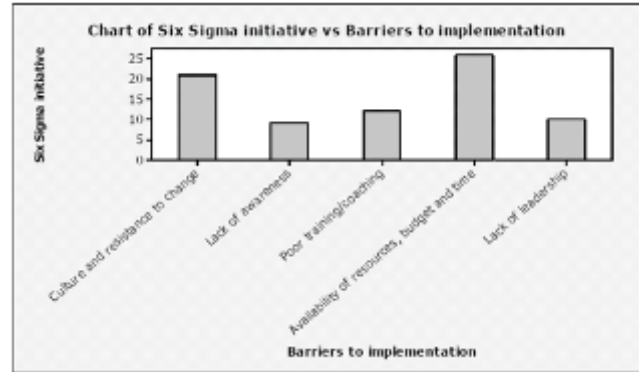


Figure 7: Barriers to implementation of Six Sigma



In order to gain greater understanding of the status of Lean Six Sigma methodology within Indian Health Care Sector, a number of semi-structured interviews were performed. The participants so far included 2 nurses, 2 Clinical Governance Managers, 1 Clinical Governance Head, 3 Medical Directors and 2 Consultants. Most of the interviews lasted between 30 and 45 minutes. What was interesting, however, from the interviews is that the responses about the use of Lean or Six Sigma within Indian Health Care Sector can be grouped into two categories: either the principles are known but not used fully and effectively or when attempts are made to use these principles, the work goes unnoticed by others in the organization. What is interesting from the results of the interviews is that majority of the interviewees actually reported knowledge of quality management tools and techniques. However the findings of the survey seem to suggest that the majority of tools and techniques being used are not seen as being useful by staff.

Conclusion and Agenda for Future Research

This paper presents the results of a pilot study on the status of both Lean and Six Sigma initiatives within Indian Health Care Sector. It appears that there is a lack of management commitment within the GPCHs to institute a culture of using Lean and Six Sigma methodologies and encouraging employees to maintain those efforts. The research on the topic is quite clear that implementing such changes in an organization requires motivation and communication with employees and others who will be directly affected and responsible for taking care of the changes. The results of this study suggest that upper management within the organization is not getting directly involved in the actual implementation of anything that would come close to encouraging widespread use of Lean and Six Sigma across GPCHs India. The findings of this study serve an important purpose not only for those within Indian Health Care Sector, but really within NHS UK. The ability to successfully

implement Lean and Six Sigma cannot be something that is left with only a few people. Instead, it must be something that the entire organization takes seriously. This requires that senior management must provide the resources and training necessary to make it happen. At the same time, there must be encouragement, which can range from financial incentives to simply providing constructive feedback to employees. In the end, it appears that GPCHs India has quite a long way to go before they can embed Lean or Six Sigma into the fabric of the organization or even to make Lean or Six Sigma as the way to work. In fact, from the data obtained from this study and the attitudes of staff members, it would seem that major changes in the culture of the organization will be required for any implementation to occur successfully within the next 5 to 10 years. As part of the future research, the authors will be increasing the sample size of the survey and make it as a longitudinal study to assess the status of GPCHs, India. Moreover we also intend to pursue a number of semi-structured interviews in the forthcoming months to obtain a greater insight into the implementation of these initiatives. The authors would also be keen to develop a bespoke roadmap for the development of Lean and Six Sigma for GPCHs along with a toolkit which supports the roadmap.

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Introduction of Freight Performance of Indian Railways

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Abstract

This article analyses the freight performance of the Indian Railways. Railways in India are primarily used for the transportation of people and commodities from one place to another place. However, this article concentrates on the role of Indian Railways in transportation of various goods from one place to another. In the beginning the article traces the important writings in various books and journals about the performance of the Indian Railway particularly about the performance of freight loading and various factors affecting its past performance, current scenario and future perspective in the fast changing situation in India. As such for the Indian Railways, the freight transportation is the main bread earner as in passenger services it incurs a huge loss. It is cross subsidized from the earning out of freight transportation, as almost eighty percent of its earning comes from the freight transportation. Traditionally, the Indian Railways have been carrying big share of freight transportation of the nation. It was almost up to eighty percent in 1950-51. However, over the period of time its contribution has been dropping relatively in a substantial manner, even though its absolute number in terms of million tonnes has kept increasing. Also, the composition of freight basket keeps changing every year. Even though prime commodities remain same, its percentage and volume keep fluctuating depending upon the market situation on the term of demand side and supply side. This article analyses what were the major commodities, how it has performed in a last few years and how it is going to perform in the coming near future. This foresight may help to understand how the dynamics of freight profile may change in coming future. Accordingly, the Indian Railways need to reorient itself with the changing profile of its customer. It needs continuous up-gradation and realignment to its assets and its capacity to meet the changing demand. Finally the article deals with the emerging challenges and opportunities which would be visible in next few years to the Indian Railways. To stay in business the Indian Railways may need to attune its assets and policy to come up with strong competitive environment of the other players of the

transportation.

Objectives of the Study

The purpose of this paper is to understand the initial stages of performance of the Indian Railways in terms of freight transportation and how it is performing presently. For this, a detailed profile of each important commodity is explained. Here an evaluation would be made, whether the present profile and trend would remain same or going to be changed in view of imminent changing environment. In fact the Indian Railways cannot expect a very stable and static market due to tough competitive environment being created by other modes of transportation, particularly roadways and waterways. Even at the policy level, the Indian Railways may need to have flexibility of different rules and regulations to meet the changing needs of the customers' along with its assets and capacity. In fact the Indian Railways may turn to become total logistic solution provider to meet the customers' expectation from the mine's head or port's head to the factory place and from the door of the factory to the customer or warehouse or market directly. Hence, here an attempt would be made to know challenges and opportunity to meet the customers' expectation. This would also try to evaluate and understand what could be the possible scenario in coming near future and what would the Indian Railways need to do to stay relevant in freight transportation business. This may require both capacity addition for the services to be available on demand and tweaking various traditional rules including higher rates to make it customer friendly and competitive in terms of price vis-à-vis other modes of transportation.

Genesis

Searching new cost effective model for freight transportation could be an effective tool for survival tactics. World over the share of freight transportation by Railways have been decreasing consistently. Although Railway is considered much better for cost effective transportation and more environmental friendly method, the downslide is prevailing in several countries. The Indian Railways (IR) has travelled a long journey since independence in

1947 to joining "More than Thousand Million tonnes Club", a distinction achieved only by a few selected countries. In 1950-51 it has merely loaded 73.2 million tonnes. This has reached to 1,101.51 million tonne in 2015-16. During this period Net Tonnes Km has also reached from 37,565 million to 654,481 million. Average load has also reached from 513 km to 594 km, respectively. Freight train kilometres and wagon kilometres increased from 112 and 4,370 million to 393 and 18,708 million by 2015-16.

Literature Review

To carry out this kind of study the most authentic document is the 'Indian Railways Year Book 2015-16. This gives the details of all freight loading statistics for the past few years along with various other details like major commodities being loaded, its share in tonnage, earning, net tonne km etc. However, this book does not highlight what are major challenges and how to meet the emerging situation. A report of National Council of Applied Economic Research on "Factors Impacting Railways, Freight Traffic in India" is another important study which gives threadbare analysis of present status of freight loading of the Indian Railways in 2016. The main objective of this study was to identify the reasons for the flattening of freight traffic and to suggest possible strategies for coming years. It suggests the need to review its excessive high freight and restrict various surcharges to make it more attractive. One journal "Indian Infrastructure" in its yearly Sector Focus has highlighted that in recent time railway sector has been the focus area of the government which is aiming to transform Indian Railways through four key strategies – expanding capacity and modernising infrastructure, improving the customer experience, focusing on safety and achieving financial self sustainability. In the present condition, the Indian Railways would need huge investment to upgrade and expand the network, induct new technology, improve safety standards, acquire and manufacture rolling stock and electrify the rail network. These may sound quite ambitious and it has to pass the taste of time to ensure that these are actually realised as per the plan of the Indian Railways. In its August 2017 issue the Indian Infrastructure noted that Ministry of Railways is also planning to develop National Rail Plan (NRP) 2030 to provide a long term perspective to plan, in consultation with all stakeholders, including state governments, public representatives and other relevant ministries with an aim to harmonise and integrate the rail network with other modes of transport and create synergy for achieving a seamless multimodal transportation network across the country. To facilitate these things to happen the Indian

Railways have also decided to adopt for international technical cooperation in the areas of traction rolling stock, electric multiple units and train sets, traction propulsion equipment, freight and passenger cars, tilting trains, railway electrification equipment, train scheduling and operation improvements station modernization, multi modal transport and modernization. In September 2017, the project of bullet train between Mumbai-Ahmadabad started. Continuing this trend in the Budget of 2018-19 largest ever capital expenditure allocation of Rs.1, 48,528 crore was made against the target of Rs.1, 31,000 crore during 2017-18. However, during 2017-2018 the Indian Railways Rs.37500 crore could not be utilized due to stunted capacity of the Indian Railways.

In April 2017, Niti Aayog issued a three year action agenda stating India's development strategy in infrastructure sector for the period of 2017-18 to 2019-20. The Niti Aayog felt that the Indian Railways suffers from issues such as low capacity, poor utilization of existing capacity, low safety levels and inferior quality of service delivery in the passenger segment. Another professional journal – Infrastructural Today has identified that the Indian Railway is financed through three channels. First is Gross Budgetary Support (GBS) from the Central Government. Second is its own internal resources such as freight and passenger revenue, leasing of railway land etc and third one is extra budgetary resources such as market borrowings institutional financing, PPPs, joint ventures etc. July-August 2017 issue of Infrastructure Today highlights that the complete overhaul of the Railways has been necessitated by two factors – first is its loss to road transport and second is its loss to airlines since the turn of the millennium. Thus there is extensive coverage of railways in various media.

Present Scenario: Dominance of Bulk Commodities

Coal

Over the period of time, prime dominance of coal transportation in the freight basket is reflected. In 2015-16 out of total 1101.51 million tonnes coal was 551.83 constituting 50.1 percent. Coal is primarily transported for various power houses in different part of the country. Earlier various power houses have been set up in different parts of the country particularly near the major city centres like Delhi, Mumbai, Kolkata and other major and medium cities. With growing population and greater economic growth the demand of power has also kept increasing for the thermal power in the country. However, in recent times, there has been some policy shift as well. With growing problems of increasing temperature and climate shift there is consistent pressure for

greater adoption of clean energy like solar energy, wind energy, hydro-electricity even at a higher cost. Although the shift may not be as faster as it appears from outside due to cost and technological reasons, the shift is sure to come, over the years. Further the laying of Pan-Indian power grids line followed with setting up of Ultra Mega Power Plants (UMPP) near the ports and pit heads would be gradually reducing the need of transportation of coal by railways. If these trends continue, after few years the transportation of coal by Indian Railways may reduce substantially.

Iron Ore & Iron & Steel

It is second major bulk commodity being transported by the Indian Railways. It was 116.94 million tonnes with 10.62% in 2015-16. Since India is still a developing country where industrialization and urbanization has a long way to go, the demand is bound to be there for iron and steel which is being produced in Indian factories. At one point of time Indian was exporting iron ore to foreign countries. Subsequently, the Supreme Court put a ban in November 2010 by imposing huge taxes. Before the ban, the Indian Railway was transporting a huge quantity of iron ore, particularly from Karnataka and Odisha to various ports for export to China and some other countries. However, after this there was grinding halt of iron ore transportation to various ports. After that there was again a thrust for the demand of domestic Iron & Steel plants. However, this demand is always dependent on international iron and steel price. At one point of time some companies particularly from China was selling Iron and Steel on much competitive price, giving a tough competition to the Indian Companies. At that time Indian Government came to the rescue by imposing higher import tariff. Further, there is another factor of anomalies in this transportation as iron ore is primarily used as a raw material for the production of iron and steel. But after the production, this traffic is not primarily offered to Indian Railways for transportation. Rather only one third to less than half quantity came to Indian Railways for its transportation. Still in 2015-16 it maintained 6th top loading commodities of Indian Railways with a loading of 44.79 million tonne a percentage share of 4.07 percent. Thus, there is a total disconnect between the loadings of iron ore which is the raw material of iron and steel which is otherwise a finish product. Probably the Indian Railways needs a strategy to link the loading of finished iron and steel.

Cement

It was top third loading commodity of Indian Railways with a loading of 105.35 million tonne with a percentage of 9.56 in

2015-16. Cement has shown a continuous downward trend in the loading on Indian Railways. This is related with two things. In India construction industry is in a phase of saturation and over supply. The construction industry in India is in a peculiar situation of where lakhs of people are living without proper housing. At the same time lakhs of homes have been kept ready for sale in all major cities. But its prices are so much hiked up that it is not within the reach of people. Till recent time there have not been many mega infrastructure projects where a huge quantity of cement is required. It may be noted that if demand is on lower side, the cement companies prefer road transportation as it enables them to provide smaller quantities at regular interval as they do not need big inventory for that. One notices consistent decline of cement traffic in relative term over the years in the overall percentage of Indian Railway's freight share. Until and unless there is big boost in infrastructural projects in a big way for long period of time along with governmental support for low price housing the traffic of cement would not persist for long. The Indian Railways cannot treat even cement as a permanent customer for a long period in a consistent manner.

Fertilizer

It stands at fourth position with 52.23 million tonne at 4.74 percent in 2015-16. The fertilizer traffic in India is government sponsored traffic where the fertilizer companies get refund of their freight charges paid for the fertilizers transported to the identified destination for a given quantity. Due to this nature presently the fertilizer industry is a captive customer for the Indian Railways. However, with the implementation of Direct Benefit Transfer to farmers the government sponsorship may change. In that situation whether the fertilizer would remain with the Indian Railways may be a question mark.

Food grains

It holds fifth position as top loading commodities in 2015-16 with 45.73 million tonne with 4.15 percentage share. Majority of food grains transported by Indian Railways falls under the government sponsorship transportation through Food Corporation of India (FCI) to maintain a regional balance of storage of food grains in various part of the country to ensure food security and distribution of food grains through ration shop of Public Distribution System (PDS). This is highly subsidised scheme of the government of India and various State Governments. With the growing prosperity and prominence of private initiatives and enterprises, the role of government intervention for food security may reduce. However, it is not going to be eliminated altogether. Rather its level of involvement may decrease as with the growing

development the dependence of poor people on government sponsored programme may reduce. Accordingly, it may be anticipated that the transport of government sponsored food grains may decrease. At the same time it is quite possible that transportation of food grain under private enterprises may increase if other situations particularly freight with road sector remains competitive.

Petroleum, Oil and Lubricants (POL)

These stand at seventh place with loading of 43.24 million tonne which is 3.93 percent of total loading in 2015-16. Since India is petroleum deficient country, it has to import crude and finished POL every year. In recent time, India has established several petroleum refineries both near the port and hinterland. These plants are used for refining the POL. In such situations India has now become both importer and exporter of POL. It imports raw crude and exports refined POL, particularly from the coastal areas. However, for domestic consumption India is still dependent up to 60 to 70 percent on such imported POL which is either refined in Indian plants or somewhere else and these are transported to hinterland. Earlier maximum quantity was being transported by the Indian Railways. However, over the period of time oil industries felt that the Indian Railway is overcharging for the POL transportation as its charging class is highest amongst all commodities. Hence it has developed pipelines to some important destination like HBJ Pipeline between Hazira, Bijapur (MP) – Jagdishpur (UP) for 1750 km & Salaya – Koyali-Mathura pipeline for 1256 km, Jamnagar to Loni for gas transportation for 1269 km, Kandla to Bhatinda for 1331 km from the western part side. Even from eastern part side it has been developed from Haldia to Barouni. Due to this almost thirty percent POL is now dispatched through pipeline. However, it has its own limitations. Laying and maintaining pipeline is a costly affair, there is product restriction in dispatch of a particular type of POL as frequent change of type of POL is not so easy in pipeline. In any case, POL like coal is likely to get a tough competition from the clean energy like solar energy, wind energy etc. As per one estimate by 2028 the production and consumption of POL would become almost at half than what it is prevailing in 2007. Even famous car companies like Tesla are giving more emphasis on developing electrical driven cars. Despite these POL is going to be in the basket, if not for very long, at least a few more years of the Indian Railway.

Limestone and Dolomite

These stand at eighth position with loading of 23.53 million tonnes with 2.14 percent share of total traffic in 2015-16. It is

primarily used in cement industry and related activities including for making colouring agent and paints. Since it is bulky commodity which is normally found in different mines in various part of the country particularly Jharkhand, Odisha, Madhya Pradesh, Chhattisgarh, Andhra Pradesh, Telangana, Karnataka, Gujarat etc. These are collected from these states and transported mostly to the nearest cement plant for the manufacturing of cement, which is primarily used in various construction industries. As per the present level of technological development the cement is most favourable bonding unit in construction of building or even concrete structure. Since in India, availability of wood for construction of house is very limited and iron and steel is much costlier to fabricate and maintain, so the cement has got a definite stream of traffic for coming near future as well. Accordingly, there would be demand of transportation of limestone and dolomite as well.

Stones including Gypsum

These stand at ninth top loading commodity with 15.04 million loading with 1.37 percent share of total commodity loaded by the Indian Railways. Stone is directly or indirectly used in various construction sites including factories, work sites, road, buildings etc. Due to transitory nature of Indian economy from the present status of developing countries to desired status of developed state in coming future the construction activities are likely to be on higher side. So there would be definite stream of such traffic in coming future as well. However, the total quantity or its share is not very high and the size of stone varies so some time transporter may feel that road traffic may be more convenient as unlike railway there is less handling and door to door delivery. Hence, the Indian Railways needs to keep a tab on the situation to remain meaningful in this segment of the market. With the changing situation, the Indian Railways has to do necessary adjustment to adapt to the market.

Salt

It stood at tenth position of top loading commodity of the Indian Railways with loading of 5.02 million tonnes which constituted 0.46 percent of total loading of the Indian Railway. Salt is a commodity which is being used by the all individual of a country. Besides, a large number of industries are also using salt as a base material like glass paint, detergent industry. As salt is an item which is being used by the commonest of the common man and during British regime salt tax was imposed to extract tax from everybody including poor, so post independence all such taxes were removed and even salt was transported at a very low cost, even without recovering entire base cost of transporting it.

Hence, the Indian Railways does not find it to be very remunerative. In the present time when the sectional time to run goods train has become very restrictive, particularly in busy routes where there have been very limited paths having been spared for the goods train, it is not considered prudent to run salt rakes, which runs at lowest price when there is clear cut traffic which is being received at a higher transportation rate. However, in the changing time the Indian Railways needs to devise a technique to retain the traffic in whatever way possible and make it remunerative.

Sugar

It was the last listed independent major commodity which was loaded 3.39 million tonnes in 2015-16 which was 0.31 percent of total loading of the Indian Railways. Unlike salt, which is considered to be an essential item, sugar in India is treated as a luxury item as richer people consume more sugar than salt. Sugar has smaller lead as it is produced almost all part of countries.

Major Challenges Ahead & Way Out

Capacity Constraint

From the above analysis, it is quite obvious that the Indian Railways is in major crisis of capacity constraint. This problem is more serious on the route of golden quadrilaterals and diagonals where there is heavy pressure of passenger transportation as well. In such routes in last seventy years, no substantially meaningful capacity addition work has been done, barring a few throughout improvements here and there. Due to increase of population associated with higher GDP growth in last few years there is substantial increase in the number of passenger and mail express trains. Any increase in passenger and mail express trains leaves lesser path availability of goods train. In such a situation, the Indian Railways has reached to a stage where it faces great difficulty even in introducing any mail express trains. Such grim situation leaves very limited possibility of adding any extra freight trains. In such situation it needs to develop additional track capacity by quadrupling the congested sections particularly golden quadrilaterals and diagonals where dedicated freight corridors are not being developed

Limited Developmental Fund

Over the last seventy years, after independence, the Indian Railways has got small surplus to invest for its own development. For quite long the railways have been able to maintain operating ratio in the range of eighty to ninety percent. Hence, it has only a small amount to invest upon itself. Since railways is from the infrastructure sector where a huge fund is required to establish

any facility so no meaningful substantial capacity addition was made in those years. Initially, when railway was being established at that time the then British Government has made huge investment for establishing the network in different parts of the country. However, just after independence the general budgetary support started declining. Even in different Five Year Plan, the focus of the government gradually shifted from the railways to the roadways. Initially it was thought that India has sufficient network of railways, whereas road connectivity between different cities, towns and villages are very poor. Hence, different schemes of National Highways, State Highways, District Roads and Village Roads started. However, there was no such scheme for the railways. This process became more prominent after the change of millennium when several speedways and highways were constructed, particularly like East-West corridors, North-South corridor. Unfortunately nothing substantial was done during this time for capacity addition in the railways. It was only in recent time with the new government at the centre, that the Indian Railways has got a huge budgetary support for its expansion and modernization plans. Making such inflow of development fund either from the government exchequer or government supported financial institution is required so that these funds should not be available on higher interest rate, which would make entire project non-viable. Further, the government has to ensure consistent flow of money for quite some time as the Indian Railways has big backlog and it would take at least some time to provide minimum improvement required to sustain the prevailing demands.

Cross-Subsidy of Passenger Services

One of the major reasons of limited internal general resource generation is highly subsidized nature of passenger services. Although, the Indian Railways was running 13,313 number of Mail/Express and Passenger trains against 9,212 freight trains daily during 2015-16. Total 65.07 percent revenue was generated out of freight trains (Rs.1, 06,941 crore) against 26.95 percent revenue (Rs.1,44,283 crore) out of total earning of Rs.1,64,334 crore during this period. It means passenger services are highly subsidized out of the earning being made by the freight services. This lopsided earning generation leads to multiple problems. Firstly, there is no relationship in running of passenger services with generation of revenue out of those services. Due to this several passenger services are introduced without generating sufficient resources to run those services. Due to this, most of new passenger services may add additional burden in the revenue potential of the Indian Railways. This results into higher burden on the freight customers. This leads to gradual shifting of

freight customers to other modes of transport where cheaper services are easily available. This means, the potentiality of the Indian Railways to get new or additional freight customer is highly diminished. Hence, if the Indian Railways is really serious to improve its prospects in future it needs to recast its present trends of ratings and charging passenger and freight services.

Making Railway Facilities More Attractive

In the present time, the railways faces most difficult task to make itself more attractive against other modes of transport, particularly roadways. This issue can be understood at two levels. First level is to make railway facilities and installations more attractive and convenient to its customers so that they are easily attracted to the railways whenever the need of transportation arises. This would require that the entire facilities like goods sheds, warehouses, wagons etc are of world class. Presently, these facilities are moderately good. Second level would be rating issue. Presently, the rate for transportation of freight is much on higher side. Over and above this, the differential classes of commodities have different rates making transportation of several commodities much costlier. For instance, transportation of salt at a class rate of 120 is much cheaper than soda ash which is at a higher class of 160. Many time customers of higher class commodities find transportation of their commodities cheaper by road, particularly when they have to carry smaller quantities. Hence, the challenge for the Indian Railways would be to decide a mode of reduction of freight rate to make it profitable as well as sustainable at the same time. Most of the time the movement of freight rate is upside only and rarely downward revision of freight is made.

Providing Total Logistic Solution

With the change of time and evolution of management concept like Just in Time (JIT) the concept of transportation is also changing to Total Logistic Solution. Earlier making arrangement for transportation was considered to be sufficient. However, now many customer wants to shift to total logistic solution where they get not only the facility of transportation but also they prefer the other allied activities like picking the commodities from the gate of supplier or pit-head, loading it on wagons or trucks, taken to the factory or production unit and after the process is complete then the product is taken to the market. Here maintaining an optimal quantity is also very important as now-a-days no company wants a very huge inventory as it leads to blockage of huge capital without giving any additional profit. Now even customer expects similar services from the Indian Railways. However, the present rule frame does not permit any such endeavour on its

part. It was expected that various private players including Container Corporation of India would provide such facilities. However, due to complicated nature of associated works, these attempts have not been much successful. The present prevailing rules of the Indian Railways does not permit for providing such integrated services to the customers. Such services would not be possible without necessary institutional support.

Summing up

Thus, there is a need of total facelift of Indian railways for freight transportation. With the massive development anticipated in near future along with great technological development with robust growth of other mode of transportation the mode of doing business would be changing all through. Accordingly, the Indian Railways would require total revamping of its freight business. The present status of freight transportation of Indian Railways would be entirely changing due to extraneous factors. Hence, the present state of business would not sustain for long and railways needs thorough modernization in terms of facilities, amenities, rule of doing business etc. If the Indian Railways wants to survive as a major player then it has to change entire activities in new framework. Otherwise the market force would weed it out due to its inefficiency and incompatibilities. Hence, it has become quite necessary to modernize the entire framework to sustain in business.

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