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Aims and Objectives : The Indian Journal of Commerce, started in 1947, is the quarterly publication of the All India Commerce Association to disseminate knowledge and information in the area of trade, commerce, business and management practices. The Journal focusses on theoretical, applied and interdisciplinary research in commerce, business studies and management. It provides a forum for debate and deliberations of academics, industrialists and practitioners.

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Dynamics of Market Concentration of Factoring Service – A Cross Country Analysis

MANOJ KUMAR SINHA AND LOVLEEN GUPTA

Abstract: The paper aims to examine the market concentration of factoring service across the countries. The Semi-log equation for growth rate, Concentration Ratio, Herfindahl-Hirschman Index (HHI) of Concentration and Entropy Index have been applied for examining the market concentration of factoring in three different country-grouping such as world, developed countries and developing countries. The period of study is 1998-2019. The forty nine countries were included in the study of market concentration of factoring service. The paper concluded that factoring service as a whole is getting popularity and acceptance in all three different country grouping. The market concentration of factoring has slowly been declining in all directions across countries. However, market concentration of factoring service is still high in a very few countries in all the three different country grouping such as the world, developed countries and developing countries.

Key Words: Factoring, Market Concentration, Short-term fund, Account Receivable, Factor.

Introduction

With the growing industrialization and consequential growth in the volume of industrial production and sales, timely collection and efficient management of receivables has assumed importance. Commercial banks normally provide working capital finance to the trade and industry. This takes the form of cash credit facility against inventory and bills finance against receivables. As no business can survive without ensuring liquidity, therefore, for catering to this requirement an innovation in services called "factoring" has shown gaining importance across the countries.

Factoring is a mode of releasing of working capital immediately or short-term funds blocked in the form of account receivables. The financing of account

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receivable, through factoring, facilitates the smooth operation of the business. The account receivable is an important component of working capital. Funds are essential and required in every business for carrying on routine business operations. Working capital funds are regarded as the life blood of the firm. A satisfactory level of working capital is to be maintained for smooth running of the business operation (Sinha, 2016).

The history of the concept of factoring reaches back to ancient Rome. However, factoring service had rapidly grown during European colonial periods in 19th century. Table 1 indicates trends of factoring business across different continents. More than two-third factoring service has been concentrated in European Countries on an average basis. However, the European concentration of factoring has declined in the recent past. In recent past, Asian Countries have been evolving as the new destination for factoring particularly China, Hong Kong, UAE etc.

Table 1: General trends of factoring services across continents

Year	America	Europe	Africa	Asia	Australasia	Developed Countries	Developing Countries
2000	20.3	66.4	0.9	11.2	1.2	92.9	7.1
2005	13.3	70.4	0.6	13.3	2.3	88.6	11.4
2010	11.3	63.4	1.0	21.6	2.8	75.4	24.6
2015	7.8	64.8	0.8	24.8	1.7	72.0	28.0
2019	7.4	66.7	0.8	23.2	1.8	72.7	27.3

Source: fci.nl

The share of American factoring service has been continuously declining from 20 percent in 1998 to 7.4 percent in 2019. American Countries include North America and South America. African countries share is less than one percent.

In the year 1998, 89 percent factoring service was concentrated in developed countries and only 11 percent in developing countries. However, the concentration of factoring service in developed countries has been consistently declining. The volume of factoring increased in developing countries in the recent past and reached to 32.1 percent in 2013 and 27.3 percent in 2019. However, more than two-third volume of factoring service is concentrated in developed countries in 2019 (Table 1).

The general pattern of global factoring service is providing the rationale to take up and examine the dynamics of market concentration of factoring service in the three different country grouping such as the world, developed country and developing countries grouping.

Objective of the Study

To examine the dynamics of market concentration of factoring service in the three different country grouping such as the world, developed country and developing countries grouping.

Literature Review

The two-third of the world factoring service is concentrated in European Countries. The introduction of the Euro is providing a significant opportunity to develop market share of factoring because of attractive opportunity of cross border transactions facilitated thereby (Lee, 1999). The factoring offers more than simply finance: through matching finance with professional credit management services, and in some cases credit protection, factoring stands out as unique from the other competing sources of external finance (Vasilescu, 2010). The enterprise's size, type of product or service it offers, industry, sector, age, turnover, value of the firm's debt, type of customers, financial statement, the management team, operational suitability, collectability, and credit notes were an important determinant in firm's choice of factoring as a source of finance for working capital and an instrument to cash-flow improvement (Soufani, 2002). Factoring may also represent an instrument of choice to manage credit risk when the cost of monitoring them is high for the seller (Smith and Schnucker, 1994). The factoring industry is an important part of many financial systems and it is a major source of finance requirements for a growing number of companies. Firm size, economic efficiency, and ownership structure influence the factoring firm's efficiency (Franco, & Philip, 2004). Factoring is larger in countries having greater economic development and growth and developed credit information bureaus (Klapper, 2006). The determinants of the level of factoring activity in an economy depends on first, the availability of financial information about enterprises; and second, the overall level of economic activity (Alayemi, et al. 2015). Factoring is claimed to be a promising alternative financing method for SME sellers. There is a negative association between Factoring/GDP and the percentage of financially obstacle firms. This relationship is found to be stronger in countries with higher values of the Credit Information Index, representing to what extent information about obligors is available to providers of financing (Kaster, 2013). The analysis of the usefulness and cost-effectiveness of factoring shows that in the period 2010–2014 in which market instabilities were observed, factoring was a useful and frequently employed means of short-term funding (Pigua, & Paduszyñska, 2015). The conducive legal and regulatory environment is important for the growth of factoring business across the countries (Suzana et al. 2017; Tamara, & Ksenija, 2012).

The existing literature explained and elaborated the overall concept of factoring, its functioning mechanism and evaluation of factoring as alternative source of financing to the small and medium enterprise (SMEs) for releasing of blocked working capital funds which facilitates smooth production activities without incurring any extra external financial burden. There are a few existing literatures which explained the dynamics of market concentration of factoring service in three different country grouping. This literature gap is the main motivation for taking up this topic for the study.

Research Methodology

Market Concentration of Factoring Services

Market Concentration means the extent to which the total world factoring business is concentrated in a few countries. Concentration in factoring business can be measured by three methods namely, Concentration Ratio, Hirschman-Herfindahl Index and Entropy Index.

Concentration Ratio

Concentration ratio is defined as the cumulative share of the largest firms. In symbolic form, the P firm concentration ratio is written as:

$$CRp = \sum_{i=1}^{P} S_i$$

Where CRp is the P country's concentration ratio, P is the number of countries included, S_i is the share of i^{th} countries in descending order (S_i Ã S_j for I Ã j)[2].

Herfindahl-Hirschman Index of Concentration

Herfindahl-Hirschman Index (HHI) is a commonly accepted measure of market concentration. It is calculated by squaring the market share of each factoring turnover country in a market, and then summing the resulting number (Bhanu Murthy and Deb, 2008). The HHI is expressed as:

$$HHI = \sum_{i=1}^{N} S_i^2$$

Where 'Si' is the market share of factoring turnover country i in the market and 'N' is the number of counties. This index ranges from 1/N to one, where 'N' is the number of countries.

A HHI index below 0.01 indicates a highly competitive.

A HHI index below 0.1 indicates not concentrated.

A HHI index between 0.1 to 0.18 indicates low concentration.

A HHI index above 0.18 to 0.30 indicates moderate concentration.

A HHI index above 0.30 indicates high concentration.

In absolute terms, we have already seen that concentration of factoring turnover has been consistently declined over periods.

Entropy Index

The Entropy Index is measured by

$$E = - \sum_{i=1}^{n} Si \; X \; logSi$$

Where

E = Entropy co-efficients

Si = Market share of ith country

n = Number of countries

The minimum value of E is zero when there is a single country in the market. The maximum value is Log n in the case of countries with equal market share. Thus, the relationship between co-efficient of E and concentration is inverse. The higher the value of E, the lower is the level of concentration and vice-versa.

Results and Analysis

Concentration Ratio

World

Table 2 shows the value of index under CR_3, CR_5 and CR_{10} of the world factoring turnover. CR_3, CR_5 and CR_{10} are the ratio of factoring turnover of top three, five and ten countries with respect to total factoring turnover of the particular year respectively. The period of study is 1998 to 2019. CR_3 maximum value is 0.539 in 2000, CR_5 maximum value is 0.713 in 2001 and CR_{10} maximum value is 0.858 in 1998. The minimum value of concentration ratio of CR_3, CR_5 and CR_{10} is 0.327 in 2010, 0.494 in 2010 and 0.738 in 2016 respectively. The CR3 and CR5 have been following the same pattern. The concentration ratio, of both groups started declining in 2002 and continuously declined till 2010; afterward it again started to increase till 2015, then again started to decline in 2016. However, the concentration ratio of CR10 is continuously showing declining trend during 1998-2016 (Table 2 and Figure 1). An overall observation indicates that 3-country, 5-country and 10-country decrease, although some fluctuation is observed in case of 3-country and 5-country. The average value of concentration ratio of CR_3, CR_5 and CR_{10} is 42.6%, 59.7% and 78.3% respectively during the reference period. Adjusted R square says about to what extent general factors affect the concentration of factoring turnover during the reference period. Adjusted R square

of CR_3, CR_5 and CR_{10} is 49.3%, 43.2% and 83.5% respectively. Compound annual growth rate (CAGR) of concentration is negative and highly statistically significant in case of CR_3, CR_5 and CR_{10}. The value of CAGR of CR_3, CR_5 and CR_{10} is -1.6%, -1.2% and -0.8% respectively. This implies that the concentration of factoring turnover is declining in all the three cases. However, the rate of declining of concentration in CR_3 is high among all three cases i.e 1.6% per annum, while in case of CR_5 and CR_{10}, the declining rate is 1.2% per annum and 0.8% per annum respectively.

Table 2: World concentration ratio of factoring turnover

Year	CR3	CR5	CR10
1998	0.503	0.686	**0.858**
1999	0.502	0.697	0.850
2000	**0.539**	0.717	0.851
2001	0.530	**0.718**	0.853
2002	0.529	0.692	0.836
2003	0.492	0.669	0.826
2004	0.452	0.631	0.807
2005	0.437	0.601	0.791
2006	0.416	0.567	0.776
2007	0.411	0.556	0.765
2008	0.344	0.506	0.763
2009	0.352	0.510	0.755
2010	0.327	0.494	0.752
2011	0.359	0.525	0.763
2012	0.389	0.549	0.747
2013	0.407	0.567	0.752
2014	0.425	0.586	0.748
2015	0.418	0.588	0.755
2016	0.381	0.562	0.738
2017	0.398	0.577	0.750
2018	0.385	0.565	0.742
2019	0.376	0.563	0.748
Average	0.426	0.597	0.783
Adjusted R Square	0.493	0.432	0.835
Growth Rate	-0.016	-0.012	-0.008
p value	0.000	0.001	0.000

Developed Countries

Table 3 shows the value of index under CR_3, CR_5 and CR_{10} of developed countries factoring turnover. CR_3, CR_5 and CR_{10} are the ratio of factoring turnover of top three, five and ten countries with respect to total factoring turnover of the particular year respectively. The period of study is 1998 to 2019. CR_3 maximum value is 0.581 in 2000, CR_5 maximum value is 0.779 in 1999 and CR_{10} maximum value is 0.921 in 1998. The minimum value of concentration ratio of CR_3, CR_5 and CR_{10} is 0.414 in 2008, 0.610 in 2008 and 0.860 in 2018 respectively. The CR3 and CR5 have been following the same pattern. The concentration ratio, of both groups started decline in 2002 and continuously declines till 2008; afterward it again started to increase till 2015, then again slightly started to decline in 2016. However, the concentration ratio of CR10 is continuously showing declining trend during 1998-2016 (Table 3 and Figure 2). An overall observation indicates that the concentration of 3-country, 5-country and 10-country decline, although some fluctuation is observed in case of 3-country and 5-country. The average value of concentration ratio of CR_3, CR_5 and CR_{10} is 49%, 68.4% and 87.9% respectively during the reference period. Adjusted R square says about to what extent general factors affect the concentration of factoring turnover during the reference period. The value of adjusted R square of CR_3, CR_5 and CR_{10} is 45.1%, 37% and 79.7% respectively. Compound annual growth rate (CAGR) of concentration is negative and highly statistically significant in case of CR_3, CR_5 and CR_{10}. The value of CAGR of CR_3, CR_5 and CR_{10} is -1.1%, -0.8% and -0.3% respectively. This implies that the concentration of factoring turnover is declining in all the three cases. However, the rate of declining of concentration in CR_3 is high among all three cases i.e 1.1% per annum, while in case of CR_5 and CR_{10}, the declining rate is 0.8% per annum and 0.3% per annum respectively.

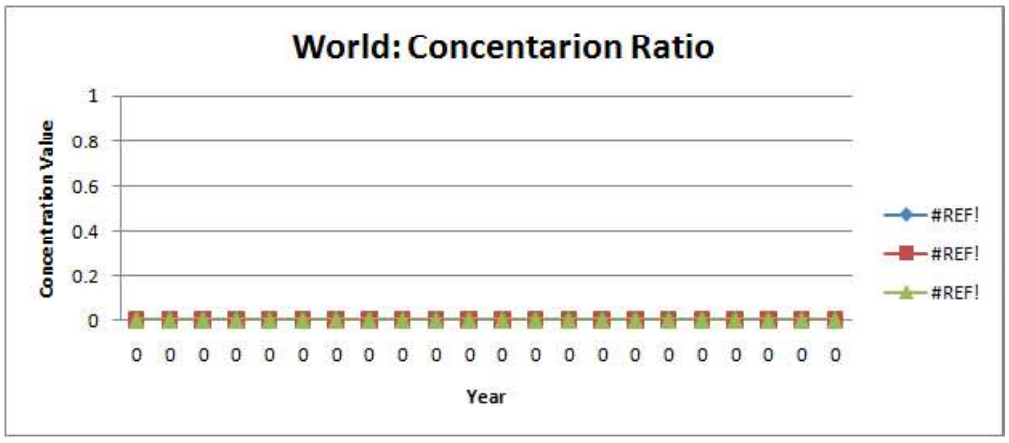

Figure 1: Concentration ratio of world factoring turnover

Developing Countries

Table 4 shows the value of index under CR_3, CR_5 and CR_{10} of developing countries factoring turnover. CR_3, CR_5 and CR_{10} are the ratio of factoring turnover of top three, five and ten countries with respect to total factoring turnover of the particular year respectively.

Table 3: Coefficients of developed countries in the factoring turnover

Year	CR3	CR5	CR10
1998	0.565	0.770	**0.921**
1999	0.561	**0.779**	0.916
2000	**0.581**	0.772	0.911
2001	0.567	0.770	0.910
2002	0.568	0.743	0.897
2003	0.535	0.726	0.892
2004	0.498	0.696	0.880
2005	0.493	0.678	0.879
2006	0.478	0.652	0.877
2007	0.480	0.648	0.873
2008	0.414	0.610	0.873
2009	0.424	0.613	0.864
2010	0.425	0.622	0.870
2011	0.429	0.624	0.872
2012	0.453	0.646	0.864
2013	0.465	0.659	0.863
2014	0.485	0.673	0.862
2015	0.495	0.677	0.866
2016	0.473	0.671	0.865
2017	0.470	0.677	0.865
2018	0.457	0.668	0.860
2019	0.456	0.671	0.863
Average	0.490	0.684	0.879
Adjusted R Square	0.451	0.370	0.797
Growth Rate	-0.011	-0.008	-0.003
P-value	0.000	0.002	0.000

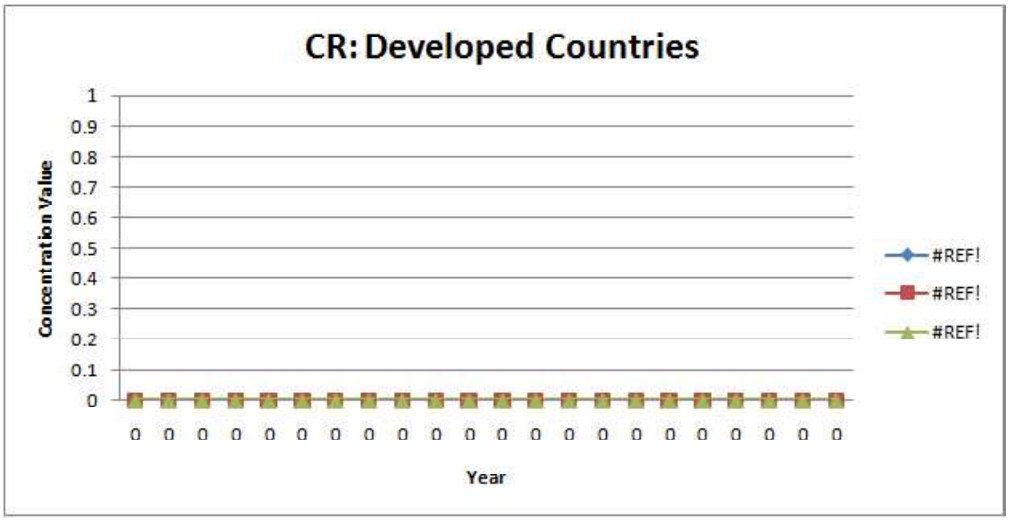

Figure 2: Concentration ratio of developed countries factoring turnover

The period of study is 1998 to 2016. CR_3 maximum value is 0.715 in 2011, CR_5 maximum value is 0.826 in 1998 and CR_{10} maximum value is 0.936 in 2001. The minimum value of concentration ratio of CR_3, CR_5 and CR_{10} is 0.505 in 2002, 0.686 in 2006 and 0.936 in 2001 respectively. The CR3 and CR5 have been following the same pattern. The concentration ratio, of both groups have been showing fluctuation trend and also showing mixed trends of rising and declining of the concentration ratio during the reference period 1998-2016. However, the concentration ratio of CR10 is showing more or less stable trend during 1998-2016 (Table 4 and Figure 3). The average value of concentration ratio of CR_3, CR_5 and CR_{10} is 61.6%, 75.7% and 95.2% respectively during the reference period. The value of adjusted R square of CR_3, CR_5 and CR_{10} is very low. Compound annual growth rate (CAGR) of concentration is positive and but not statistically significant except in case of CR_3.

Table 4: Coefficients of developing countries in the factoring turnover

Year	CR3	CR5	CR10
1998	0.697	0.826	0.963
1999	0.641	0.791	0.961
2000	0.540	0.736	0.965
2001	0.515	0.700	0.936
2002	0.505	0.707	0.949
2003	0.559	0.723	0.947
2004	0.582	0.731	0.948

Contd...

2005	0.588	0.737	0.944
2006	0.512	0.686	0.944
2007	0.524	0.709	0.953
2008	0.565	0.719	0.949
2009	0.609	0.771	0.947
2010	0.671	0.809	0.962
2011	0.715	0.808	0.968
2012	0.696	0.797	0.964
2013	0.702	0.794	0.960
2014	0.687	0.781	0.953
2015	0.676	0.786	0.951
2016	0.617	0.748	0.946
2017	0.662	0.781	0.954
2018	0.648	0.759	0.942
2019	0.633	0.750	0.936
Average	0.616	0.757	0.952
Adjusted R Square	0.217	0.029	-0.015
Growth Rate	0.009	0.002	0.000
p Value	0.017	0.216	0.413

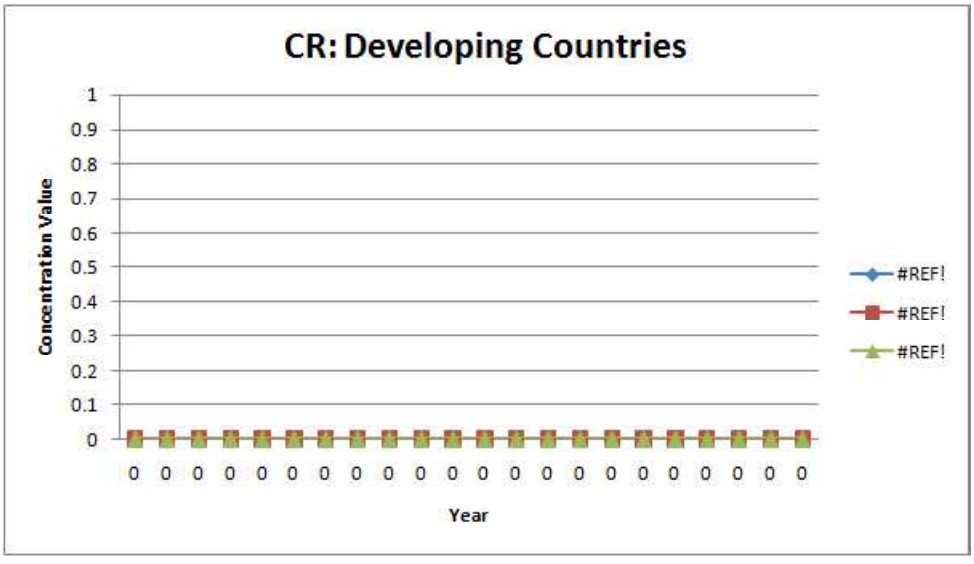

Figure 3: Concentration ratio of developing countries

The value of concentration ratio of CR_3, CR_5 and CR_{10} of developing countries is higher than of developed countries and world and value of developed countries is higher than world but less than developing countries. It means developing countries is highly concentrated in term of factoring turnover.

Herfindahl-Hirschman Index of Concentration

World

With globalization and liberalization, there should be low concentration of factoring turnover across countries. Herfindal's index (HHI) of concentration clearly indicates that there is a low concentration of factoring turnover across countries. The maximum value of concentration is 0.119 in 2000. This value, as per HHI, is low concentration. The minimum value of concentration is 0.069 in 2010. The average value is 0.090 during 1998-2019 (Table 5). Concentration of factoring turnover is slightly increased during 1998-2000; thereafter it starts to decline (Figure 4). Overall, the concentration of factoring turnover of the world is low. It means factoring turnover is not concentrated in a few countries in the world. The value of adjusted R square is 66.7 percent. It means general variable i.e. time variable explains to the extent of 66.7 percent change in factoring turnover during 1998-2019. We have used semi-log equation for getting regression statistics. The value of coefficient is negative and statistically significant at 1 percent level of significance. The growth rate (CAGR) is -0.2% p.a. (Table 6). This means the concentration of world factoring turnover is declining at the rate of 0.2% per annum during the reference period 1998-2019.

Table 5: World HHI of factoring turnover

Year	World
1998	0.109
1999	0.110
2000	0.119
2001	0.118
2002	0.117
2003	0.110
2004	0.101
2005	0.100
2006	0.092
2007	0.091
2008	0.072
2009	0.073

Contd...

2010	0.069
2011	0.073
2012	0.078
2013	0.082
2014	0.085
2015	0.083
2016	0.075
2017	0.080
2018	0.077
2019	0.076
Average	0.090

Table 6: Regression statistics of world HHI concentration

Regression Statistics					
Multiple R	0.826				
R Square	0.683				
Adjusted R Square	0.667				
Standard Error	0.010				
Observations	22				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.004	0.004	43.045	0.000
Residual	20	0.002	0.000		
Total	21	0.006			
	Coefficients	*Std Error*	*t Stat*	*P-value*	
Intercept	4.424	0.660	6.698	0.000	
Year	-0.002	0.000	-6.561	0.000	

Developed Countries

Table 7 depicts the concentration ratio of factoring turnover in developed countries. Herfindal's index (HHI) of concentration clearly indicates that there is a low concentration of factoring turnover across developed countries. The maximum value of concentration is 0.137 in 2000. This value, as per HHI, is low concentration. However this value is slightly higher than that of the world HHI. The minimum value of concentration is 0.098 in 2009. The average value is 0.115 during 1998-2019. Concentration of factoring turnover is slightly increased during 1998-2000; thereafter it starts to decline (Figure 4). However, the concentration of factoring turnover is slightly higher in case of developed countries than that of the concentration of world factoring (Table 6 and Table 7). In regression statistics, The value of adjusted R square is 63.7 percent. It means general variable i.e. time variable explains to the extent of 63.7 percent change in factoring turnover during 1998-2019. The coefficient (time) indicates compound annual growth rate (CAGR) of concentration during 1998-2019. The value of coefficient is negative and statistically significant at 1 percent level of significance. The growth rate (CAGR) is -0.2% p.a. (Table 8). This means the concentration of world factoring turnover is declining at the rate of 0.2% per annum during the reference period 1998-2016.

Table 7: Developed countries HHI of factoring turnover

Year	Developed
1998	0.134
1999	0.134
2000	0.137
2001	0.135
2002	0.135
2003	0.128
2004	0.121
2005	0.124
2006	0.119
2007	0.120
2008	0.099
2009	0.098
2010	0.099
2011	0.100

Contd...

2012	0.103
2013	0.107
2014	0.112
2015	0.114
2016	0.107
2017	0.107
2018	0.103
2019	0.103
Average	0.115

Table 8: Regression statistics of developed countries HHI concentration

Regression Statistics					
Multiple R	0.809				
R Square	0.654				
Adjusted R Square	0.637				
Standard Error	0.008				
Observations	22				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.003	0.003	37.863	0.000
Residual	20	0.001	0.000		
Total	21	0.004			
	Coefficients	*Std Error*	*t Stat*	*P-value*	
Intercept	3.570	0.561	6.359	0.000	
Year	-0.002	0.000	-6.153	0.000	

Developing Countries

Table 9 depicts the concentration ratio of factoring turnover in developing countries. Herfindal's index (HHI) of concentration clearly indicates that there is a high concentration of factoring turnover across developing countries. The maximum value of concentration is 0.326 in 2014. This value, as per HHI, is high

concentration. The minimum value of concentration is 0.124 in 2002. The average value is 0.213 during 1998-2019 (Table 9). Concentration of factoring turnover is suddenly increased very high after 2007. The value reached to more than 0.300. This is the case of very high concentration as per HHI. The year 2007 is known for global financial crisis. It means business of factoring turnover is high located and concentrated in a few developing countries such as China, Hongkong, UAE etc. In general, the concentration of factoring turnover of developing countries is higher than that of the world and developed countries during the respective period (Table 5, Table 7 and Table 9 & Figure 4).

Table 9: Developing countries HHI of factoring turnover

Year	Developing
1998	0.212
1999	0.178
2000	0.141
2001	0.127
2002	0.124
2003	0.145
2004	0.153
2005	0.159
2006	0.134
2007	0.129
2008	0.143
2009	0.164
2010	0.206
2011	0.278
2012	0.301
2013	0.315
2014	0.326
2015	0.310
2016	0.251
2017	0.305
2018	0.293
2019	0.284
Average	0.213

The value of adjusted R square is 60 percent. It means general variable i.e. time variable explains to the extent of 60 percent change in factoring turnover during 1998-2019. The coefficient (time) indicates compound annual growth rate (CAGR) of concentration during 1998-2019. The value of coefficient is positive and statistically significant at 1 percent level of significance. The growth rate (CAGR) is 0.9% p.a. (Table 10). This means the concentration of world factoring turnover is increasing at the rate of 0.9% per annum during the reference period 1998-2019.

Table 10: Regression statistics of developing countries HHI concentration

Regression Statistics					
Multiple R	0.787				
R Square	0.619				
Adjusted R Square	0.600				
Standard Error	0.048				
Observations	22				
ANOVA					
	df	SS	MS	F	Significance F
Regression	1	0.074	0.074	32.506	0.000
Residual	20	0.045	0.002		
Total	21	0.119			
	Coefficients	*Std Error*	*t Stat*	*P-value*	
Intercept	-18.125	3.216	-5.635	0.000	
Year	0.009	0.002	5.701	0.000	

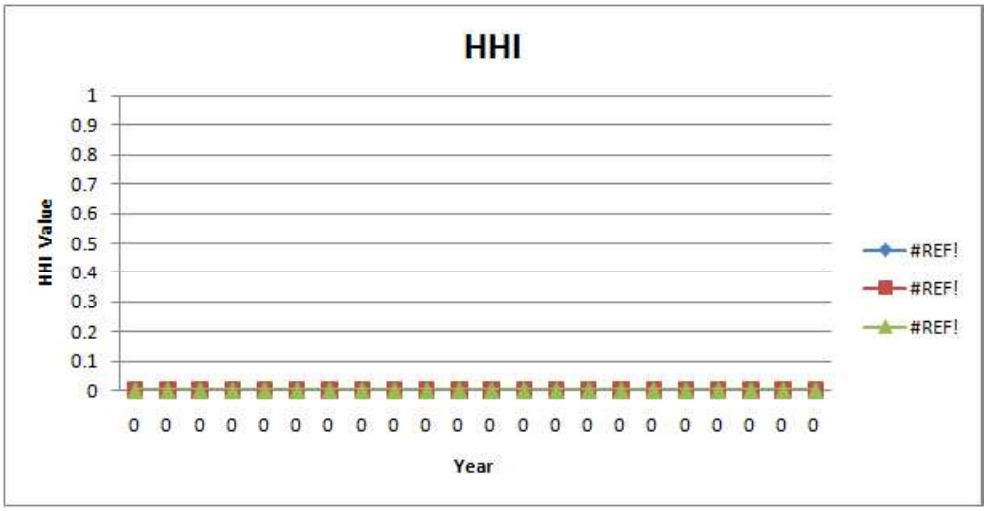

Figure 4: HHI Index of the factoring turnover

Entropy Index

Entropy index is used to whether factoring service is concentrated or not. Higher value of entropy index means no concentration of factoring or vice-versa.

Table 11: Entropy index of factoring turnover

Year	World	Developed	Developing
1998	2.618	2.314	1.936
1999	2.624	2.314	2.064
2000	2.576	2.327	2.218
2001	2.581	2.339	2.301
2002	2.619	2.373	2.299
2003	2.675	2.413	2.230
2004	2.755	2.471	2.198
2005	2.797	2.474	2.196
2006	2.863	2.504	2.298
2007	2.887	2.509	2.285
2008	2.984	2.587	2.241
2009	2.987	2.608	2.161
2010	3.010	2.599	2.000
2011	2.970	2.591	1.827
2012	2.962	2.585	1.803
2013	2.941	2.566	1.780
2014	2.925	2.542	1.778
2015	2.922	2.530	1.812
2016	2.988	2.562	1.977
2017	2.952	2.560	1.830
2018	2.977	2.576	1.880
2019	2.979	2.572	1.913
Average	2.845	2.496	2.047
Adjusted R Square	0.738	0.697	0.432
Growth rate	0.008	0.005	-0.010
P-value	0.000	0.000	0.001

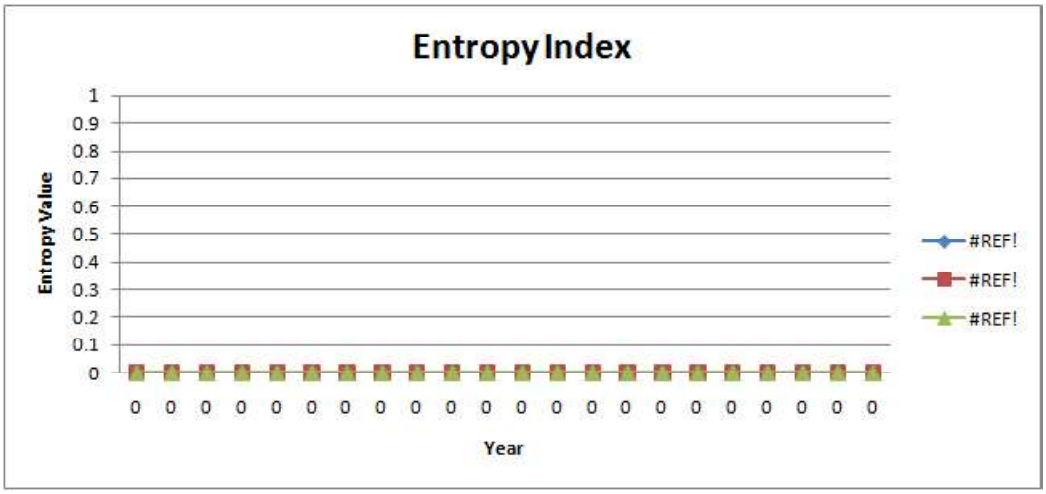

Figure 5: Entropy index of factoring turnover

HHI Index & Entropy Index

World

In case of the world, the value of entropy index shows the inverse pattern of HHI concentration ratio. It means when value of HHI is increasing, the value of entropy index is declining and vice-versa. This is evident from the Figure 6. The maximum value of entropy index is 3.010 in 2010, the minimum value is 2.576 in 2000 and average value is 2.845. In regression statistics, adjusted R square is 73.8%, Compounded annual growth rate (CAGR) is 0.8% per annum at 1% level of significance. It means coefficient of entropy index of the world is increasing at the rate of 0.8% per annum.

Developed Countries

In case of the developed countries, the value of entropy index shows the inverse pattern of HHI concentration ratio. It means when value of HHI is increasing, the value of entropy index is declining and vice-versa. This is evident from the Figure 7. The maximum value of entropy index is 2.608 in 2009, the minimum value is 2.314 in 1998 and average value is 2.496. In regression statistics, adjusted R square is 69.7%, Compounded annual growth rate (CAGR) is 0.5% per annum at 1% level of significance. It means coefficient of entropy index of developed countries is increasing at the rate of 0.5% per annum. However, CAGR of developed countries is lower than of the world.

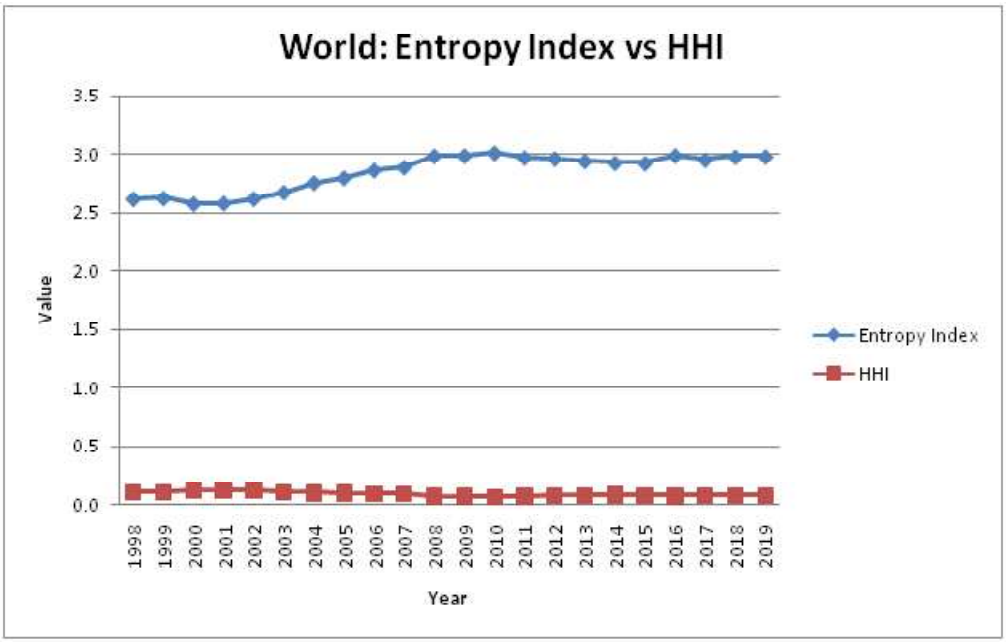

Figure 6: Comparison between HHI and entropy index of world factoring turnover

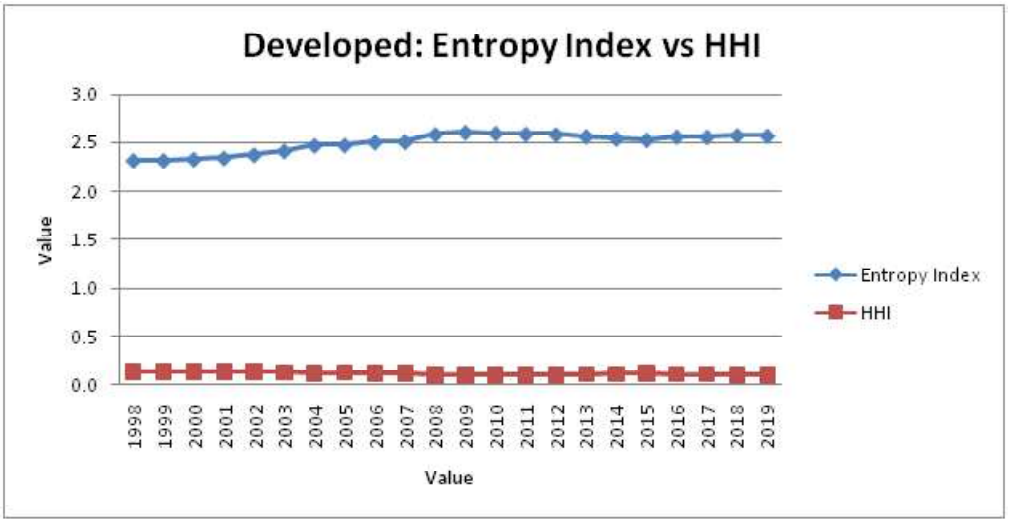

Figure 7: Comparison between HHI and entropy index of developed countries of factoring

Developing Countries

In case of the developing countries, the value of entropy index shows the inverse pattern of HHI concentration ratio. It means when value of HHI is increasing,

the value of entropy index is declining and vice-versa. This is showing the substitution effect between HHI and entropy index. This is evident from the Figure 8. The maximum value of entropy index is 2.301 in 2001, the minimum value is 1.778 in 2014 and average value is 2.047. In regression statistics, adjusted R square is 43.2%, Compounded annual growth rate (CAGR) is -1.0% per annum at 1% level of significance. It means coefficient of entropy index of the developing countries is declining at the rate of -1.0% per annum.

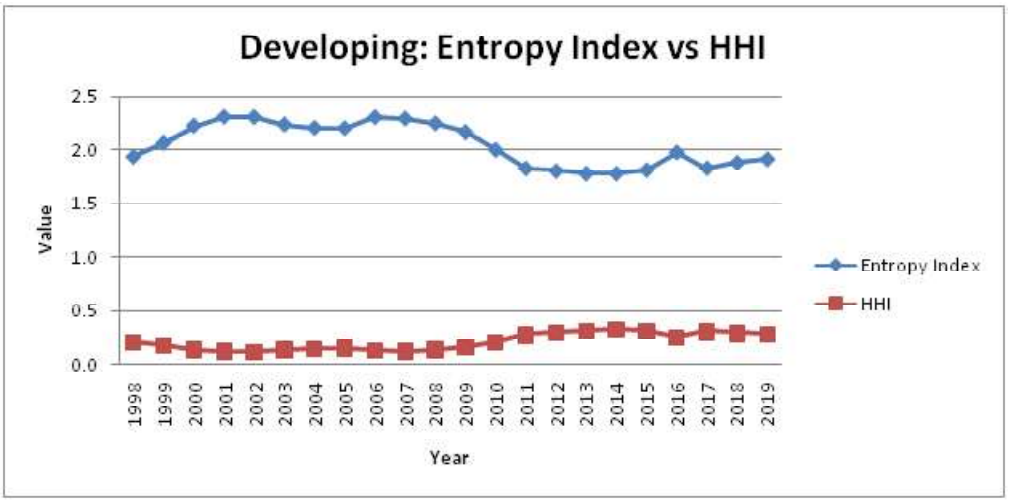

Figure 8: Comparison between HHI and entropy index of developing countries factoring

Conclusion and Policy Implication

Factoring is expanding in all parts of the world. However factoring business is still found to be highly concentrated in a few countries like UK, USA, France, China etc. The upward growth of factoring business in some major countries has been particularly noticeable. World factoring and developed countries factoring have similar growth pattern, however growth pattern of developing countries is highly fluctuating. In nutshell, it can be concluded that factoring business as a whole is expanded in all directions across countries, although concentration of factoring business is high in a very few countries in case of world, developed countries and developing countries respectively. The decline in market concentration of factoring service across the countries leads to increase in demand for factoring service which makes it more competitive across the globe.

There is a need to set up an international integrated factoring regulatory framework for regulating short-term credit and financing environment on long-term sustainable basis which facilitates factoring as an affordable and efficient source of alternative financing of account receivables which, in general, provides

a cost effective asset based credit finance and in particular, ensures an efficient and timely financing of SMEs accounts receivables. This will increase the promotion of factoring industry in developing markets, enhancing the awareness of the many benefits the service offers to SMEs, and taking a more assertive role in lobbying and influencing to tell the story that the industry represents the safest and most secure means of financing to SMEs around the world. The factoring industry needs to have discipline, minimum standards of excellence and a shared vision for the future.

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Price Discovery and Volatility Spillover in India: An Evidence from Futures and Spot Base Metals Market

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Abstract: This Paper aims to analyze the price discovery process and volatility spillover mechanism in commodity derivatives market in India for copper, nickel, zinc, aluminium and lead over a period from January, 2011 to March, 2020. Cointegration test, granger causality test and vector error correction modelare have been used to analyze the price discovery process. The bivariate exponential garch (EGARCH) model is employed to investigate the volatility spillovers in futures and spot market. Results of VECM supported by granger causality test show that futures market dominate the spot market and serves as effective source of price discovery. Results from EGARCH (1,1) model indicate that volatility spillovers from futures to spot market for copper, lead and nickel. The findings of the study can help to market participants like traders, investors and manufacturers to hedge their risk against adverse market movements.

Key words: Price discovery, Volatility spillover, VECM, EGARCH, Spot market

Introduction

India is a significant producer and consumer of metals and net importer of base metals to meet domestic consumption demand. The most widely traded and used base metals are copper,nickel, zinc, aluminium, lead, and tin. MCX iCOMDEX Base Metals Index is one of the sectoral indices in the MCX iCOMDEX family, and it includes the liquid base metal futures contracts traded on MCX i.e., futures of copper, nickel, zinc, aluminium and lead. This index is an indicator of the fundamentals and performance of the industrial sector. Base metal commodities contribute 17.01% to the total non-agricultural derivatives turnover. Therefore, this paper considered the five base metal commodities (copper, nickel, zinc, aluminium and lead) highly traded on MCX and which are the part of MCX iCOMDEX Base Metals Index. MCX is the largest commodity exchange in India with a market share of 97.05%. Risk management and price discovery are two important function of commodity derivatives market. Price discovery process

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refers to using the futures prices for pricing the spot market transactions and the significance of price discovery depends upon a close relationship between the prices of futures contracts and prices of cash markets (Garbade and Silber, 1983). It is believed that futures market leads to the price discovery process as futures market is more innovative and absorbs new information instantly (Mahalik *et al.*, 2014; Arora and kumar, 2013). As opposed to this, there are some studies which have observed that spot market lead to futures market (Srinivasan and Ibrahim, 2012; Purohit *et al.*,2015). The existence of contradict findings regarding lead-lag relationship of spot and futures market creates scope to reexamine price discovery process in order to gain fresh insights from recent data. The function of price discovery based on whether the new information is reflected first in the changes of spot markets or changes of futures markets. According to efficient market hypothesis, the new information should be incorporated in both markets simultaneously. There are some imperfections like difference in transaction cost, different margin requirements and different liquidity in both markets due to which one market may react more quickly than other and may produce lead-lag relationship between two markets. The study of Volatility spillover in commodity market provides useful insights into how the new information from one market affects the volatility process of another market. volatility spillover is directly related to the flow of information in arbitrage free economy. If flow of information increases in futures market,volatility will rise in the underlying spot market. The price discovery function and volatility spillover are the issues of interest to marketers, financial analysts, and policymakers. Hence, the study aims to investigate the price discovery and volatility spillover in futures and spot prices of above mentioned commodities. This study throws light on the determination of price (future price or spot price) which will serve as an efficient price discovery vehicle and the direction of volatility spillover.

Review of Literature

The price discovery function of commodity derivatives market and volatility spillover between futures and spot market have received considerable attention in the literature of Indian commodity derivative market. Several studies have been conducted by taking a sample of various commodities such as agricultural commodities, precious metal commodities, non-precious metal and energy commodities. These studies are conducted on individual commodity and on combination of various commodities.

Shihabudheen and Padhi (2010) studied the volatility spillover and price discovery process taking a sample of six commodities and concluded that lead of futures market of commodities on spot market was stronger in five commodities out of six.The authors also concluded that volatility spills over from futures to spot except sugar contract. Srinivasan and Ibrahim (2012) carried out the study of

price discovery and volatility spillovers in Gold market. Analysing the prices of gold from NCDEX, authors showed that spot market serves effective price discovery and the information also spillover from spot to futures market. Dey and Maitra (2012) analyzed the price discovery mechanism for pepper market in India covering the period from 2006 to 2010 and observed that futures market confirms the price discovery. Kumar and Pandey (2013) have been examined the market efficiency for eleven commodities including four agricultural commodities and seven non-agricultural commodities (aluminium, zinc, copper, gold, silver, natural gas and crude oil) by employing ECM- GARCH model. Using the spot prices and near month and next to near month futures prices for a period from 2004 to 2008, the authors reached to the conclusion that futures prices of eight out of eleven commodities are efficient predictors spot prices.

Arora and Kumar (2013) analyzed the futures market's role in price discovery mechanism of copper and aluminium by applying cointegration test and VECM. Using the daily spot and near month futures prices, the authors suggested that futures market is more informationally efficient than the underlying spot market. Purohit *et al.* (2015) studied the role of price discovery in nonprecious metals market (copper, aluminium, lead, nickel and zinc) in India using daily closing prices of the selected commodities for the period from 2006-2013. The authors found that spot prices makes greater adjustment than the futures prices and thus, future prices lead to the prices discovery process. Bahera (2016) examined the price discovery and spillover impact in metal and energy market (silver, gold and copper) in India for a period of 2005 to 2016. By employing error correction model and multivariate GARCH (BEKK) model, the author concluded that price discovery takes place in futures market and futures market volatility impacts the spot market volatility. Gupta *et al.* (2018) investigated the efficiency and price discovery in Indian commodity market for eight commodities including copper, nickel, crude oil, natural gas, gold, silver, castor seeds and guar seeds over a period from 2004 to 2014 and suggested that price discovery happens in futures market. Rout *et al.* (2019) studied the spillover effect in commodity derivatives market in India by considering five metal and five agriculture commodities traded on McX by employing generalized impulse response function. Analyzing the data from 2010 to 2015, the authors revealed that there exist bidirectional volatility spillover in both metal and agricultural commodities but futures market leads to volatility in case of agricultural commodities while in metal commodities spot market lead to volatility.

From the above discussion, we have found the three gaps: (1) The empirical literature on price discovery and volatility spillover for metal commodities in India is very scantand have contradictory findings (2) Majority of the studies on base metals have explored the price discovery process only the studies have been carried individually on volatility spillover and price discovery.There is only

one study by Ramesh and Bretto (2018) which have studied the combination of price discovery and volatility spillover in case of ten metals commodities traded in India. The authors found that for most of commodities, the information transmitted from futures market to spot market.

Objective of the Study

The major objective of the study is to empirically investigate the price discovery and volatility spillover in futures and spot prices of copper, nickel, zinc, aluminium and lead with the help of VECM and EGARCH Model.

Research Methodology

To investigate the price discovery process and volatility spillovers in Indian commodity derivatives market, this study has taken a sample of five base metal commodities which are the part of MCX iCOMDEX Metal Index. The sample commodities are copper,nickel, zinc, aluminium and lead. The data set comprises daily closing prices of near-month futures contracts and spot market for all commodities which are gathered from Multi Commodity Exchange(MCX) database. MCX has highest trading volume for base metals.The study period has been selected from January, 2011 to March, 2020. Daily price series are converted into daily returns and used for further analysis.

Price discovery process follows a two step procedure. In first step, long run relationship is tested between futures and spot prices; and in second step, causality is examined between the prices (Quan,1992). Cointegration test is used to test the long run relationship between futures and spot market. Vector error correction model (VECM) is used to examine causal relationship between spot and futures market in the present study. Thus, Johansen's cointegration test and vector error correction model have been used to analyze the price discovery process in spot and futures market of sampled commodities. Fifth section is subdivided into four categories to investigate the price discovery and volatility spillover process.

Unit root test

There is a precondition of testing the stationarity of the financial time series as modelling with non-stationary data may produce spurious results.To check the stationarity of data, Augmented Dickey– Fuller (ADF) (Dickey and Fuller, 1981) test has been used.The ADF model tests unit root is as follows:

$$\Delta Y_t = \mu + \delta Y_{t-1} + \sum_{i=1}^{k} \beta_i \Delta Y_{t-i} + \varepsilon_t (1)$$

Where,

Y_t = Price series

μ = a constant

ΔY_t = first difference of Y_t

ε_t = error term

Cointegration test

Cointegration test is employed to study the long run equilibrium relationship between the price series of commodities. We have used the Johansen cointegration test proposed by Johansen and Juselius (1990) and Johansen (1991) to test the cointegration. Johansen cointegration test is very sensitive to the lag lengths used in the test. For the appropriate lag length, we have used the VAR model. Lag length is decided by the Akaike Information Criteria (AIC). For the application of Johansen cointegration analysis, the price series must be integrated of order one. Johansen and Juselius (1990) have suggested the two likelihood ratio tests i.e., trace test and maximum eigenvalue test to test the cointegration between series.

The null hypothesis of "at most r cointegrating vectors" is tested against the alternative hypothesis of "more than r cointegrating vectors" by $ë_{trace}$statistic:

$$\lambda_{trace} = -T \sum_{i=r+1}^{n} \ln(1 - \hat{\lambda}_i) \quad (2)$$

where, T is the total number of observations, r is the number of cointegrating vectors, $\hat{\lambda}_i$ are the eigen values obtained from II matrix. The values of test statistic will depend on the value of $\hat{\lambda}_i$. Large value of $\hat{\lambda}_i$ will make the value of $(1-\hat{\lambda}_{ii})$ more large and negative. Thus, the value of test will be large with large value of $\hat{\lambda}_i$.

The null hypothesis of"r cointegrating vector"is tested against the alternative hypothesis of "r + 1" by λ_{max}test statistic :

$$\lambda_{max} = T \ln (1-\hat{\lambda}_{r+1}) \quad (3)$$

If r=0, then in case of trace test statistic, the null hypothesis can not be rejected. In this case, it can be concluded that there is no cointegration. In case of maximum eigenvalue statistic, if r=1 then the null hypothesis is not rejected. If r=0 then the null hypothesis for maximum eigenvalue statistic is rejected. In this case, we will conclude that there exists a cointegration relationship.

Vector error correction model and granger causality test

Cointegration analysis confirms the long run equilibrium relationship among the markets and allows the divergence of respective markets from log run equilibrium

in the short run. The short run dynamics and disequilibrium among the series can be expressed as VECM. VECM shows the long run equilibrium relationship of spot and futures prices by inducing a short run dynamic adjustment mechanism that describes how the variables adjust when they are in disequilibrium.The presence of short run dynamic adjustment mechanism confirms the price discovery process.When two series tend to exhibit cointegration, then the vector error correction model (VECM) proposed by Johansen (1988)can be applied according to equation (4) and (5).

$$\Delta S_t = \alpha_S + \sum_{i=1}^{m} \beta_{Si} \Delta S_{t-i} + \sum_{j=1}^{m} \gamma_{Fj} \Delta F_{t-j} + \lambda_S Z_{t-1} + \varepsilon_{St} \quad (4)$$

$$\Delta F_t = \alpha_F + \sum_{i=1}^{m} \beta_{Fi} \Delta F_{t-i} + \sum_{j=1}^{m} \gamma_{Sj} \Delta S_{t-j} + \lambda_F Z_{t-1} + \varepsilon_{Ft} \quad (5)$$

$$Z_{t-1} = S_{t-1} - F_{t-1} \quad (6)$$

In the above equations, Z_{t-1} denotes the equilibrium error that measures how the S_t or F_t adjusts to the previous period's deviation from the long run equilibrium from equation (4) or (5). The coefficients of error correction term λ_S and λ_F are the speed of adjustment coefficients. The magnitude of λ_S and λ_F determine the speed of adjustment back to long run equilibrium. When S_t and F_t are cointegrated, the coefficients of Z_{t-1} will capture the direction of longruncausality. If λ_S and λ_F both are found to be significant, then it is said that there exist a two way feedback relationship between S_t and F_t.

Granger causality approach proposed by Granger (1969) is used to understand the short run lead-lag relationship between the futures and spot markets of sample commodities. The model of granger causality is as follows:

$$\Delta S_t = \sum_{i=1}^{m} a_{1i} \Delta S_{t-i} + \sum_{j=1}^{m} b_{1j} \Delta F_{t-j} + \varepsilon_{1t} \quad (7)$$

$$\Delta F_t = \sum_{i=1}^{m} a_{2i} \Delta F_{t-i} + \sum_{j=1}^{m} b_{2j} \Delta S_{t-j} + \varepsilon_{2t} \quad (8)$$

The null hypothesis in Equation (7) is $b_{1j} = 0$, which indicates that futures prices does not Granger cause spot prices. Similarly, the null hypothesis in Equation (8) is $b_{2j} = 0$ which states that spot prices does not granger cause futures prices.

EGARCH model

The study of volatility spillover in commodity market helps to examine how the new information from one market affects the volatility process of another market. To study the volatility spillover between spot and futures market for five commodities, the exponential generalized autoregressive conditional hetroscedasticity(EGARCH) model proposed by Nelson (1991) has been used.The

EGARCH model captures the leverage effect (bad news causes higher volatility than the good news) found in the returns series and there are no restrictions on parameters to maintain the conditional variance positive as in GARCH model due to exponential form of conditional variance.This model can be estimated by a two step approach. For the first step VECM is applied and then its residuals are saved for the use in bivariate EGARCH (1,1)model. Thus, this approach is equivalent to joint estimation of VECM and EGARCH models as estimating these models simultaneously is not practical for large number of parameters (Mahalik *et al*. 2014).

The EGARCH(1,1) can be presented as follows:

$$\ln\left(\sigma_{f,t}^2\right) = \sigma_f + \text{GO}_f\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}} - \sqrt{\frac{2}{\pi}}\right| + \gamma_f \ln\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \alpha_f \ln\left(\sigma_{2,t-1}^2\right) + \nu_f \ln\left(\varepsilon_{s,t-1}^2\right) \quad (9)$$

$$\ln\left(\sigma_{s,t}^2\right) = \sigma_s + \text{GO}_s\left|\frac{\varepsilon_{t-1}}{\sigma_{t-1}} - \sqrt{\frac{2}{\pi}}\right| + \gamma_s \ln\frac{\varepsilon_{t-1}}{\sigma_{t-1}} + \alpha_s \ln\left(\sigma_{2,t-1}^2\right) + \nu_s \ln\left(\varepsilon_{f,t-1}^2\right) \quad (10)$$

Where,

$\ln\left(\sigma_{s,t}^2\right)$ and $\left(\sigma_{f,t}^2\right)$ represent conditional time-varying variances of spot and futures returns. The coefficient of $\acute{\imath}_f$ and $\acute{\imath}_s$represent the volatility spillover coefficient. $\left(\varepsilon_{s,t-1}^2\right)and\left(\varepsilon_{f,t-1}^2\right)$ are the uncorrelated residuals obtained from VECM model.

Results and Discussion

Descriptive statistics

Table 1 shows the descriptive statistics for the futures and spot prices, such as mean, median, maximum, minimum, standard deviation, skewness, kurtosis, jarque-bera and probability. It can be observed from the table that mean futures price is higher than the corresponding spot price in case of all the commodities. Volatility is higher in spot market than the corresponding futures market for all the commodities as suggested by the standard deviation. Higher volatility in any market could be seen as an indicator of information asymmetry among market participants. Considering the skewness values, all the spot and futures price series are positively skewed except the spot and futures price series of copper during the sample period. The value of kurtosis shows the lack of symmetric in the distribution. The results of Jarque-Bera test indicates that all the price series are not normal except the futures series of nickel as the null hypothesis of normality of series has been rejected at 1%.

Stationary test of commodity futures and spot prices

All the variables under consideration have been examined for the presence of stationarity using ADF unit root test. This test is applied in the level form and first difference of data. If the futures and spot prices of the selected commodities are not stationary at level, then first difference of the price series is taken to eliminate the problem of unit root.Table 2 shows the results of ADF test for the near month futures prices and spot prices at level and first difference. In table 2, ADF test indicates that all the series are non-stationary at level and became stationary after their first difference. Thus, the spot and futures price series are integrated at order one i.e., I(1).

Johansen cointegration test

Since the variables are integrated at order one i.e., I(1), hence Johansen cointegration test could be applied. The cointegration tests are conducted on log prices of spot and futures market for all commodities using two trace test and maximum eigen test. The results of these tests are presented in table 3. The results show that the price series are cointegrated at 1% significant level. The null hypothesis of zero cointegrating vector can be rejected and inferred that spot and futures series of all the commodities are cointegrated.

Table 2. Results of unit root test

Commodity		At Level With Intercept t value	p value	At First Difference With intercept t value	p value
Augmented Dickey Fuller Test					
Copper	FP	-2.847	0.052	-51.911*	0.0001
	SP	-2.862	0.0501	-55.659*	0.0001
Nickel	FP	-2.511	0.1129	-35.931*	0.0000
	SP	-2.461	0.1252	-32.352*	0.0000
Zinc	FP	-1.391	0.5882	-52.374*	0.0001
	SP	-1.493	0.5374	-32.772*	0.0000
Aluminium	FP	-2.514	0.1122	-35.592*	0.0000
	SP	-2.493	0.1174	-35.294*	0.0000
Lead	FP	-2.662	0.0808	-37.670*	0.0000
	SP	-2.583	0.0965	-37.697*	0.0000

Notes: (*) shows significance at 1% level of significance. FP stands for futures prices and SP stands for spot prices.

Source: E-views computations based on data collected from MCX.

Table 1. Descriptive statistic

commodity	Price	Mean	Median	Maximum	Minimum	Std. Dev.	Skewness	Kurtosis	J-B	Probability
Copper	Future	409.24	419.33	509.95	291.90	42.09	-0.94	3.09	360.23	0.00
	Spot	407.05	417.25	497.55	288.25	42.43	-0.94	3.08	362.18	0.00
Nickel	Future	884.42	895.45	1319.60	0.00	167.85	0.00	2.96	0.16	0.92
	Spot	881.63	893.15	1331.60	0.00	170.36	0.00	3.25	6.31	0.04
Zinc	Future	143.31	129.20	231.80	86.90	39.00	0.53	1.88	242.93	0.00
	Spot	143.14	128.85	232.50	0.00	39.69	0.51	1.93	223.94	0.00
Aluminium	Future	118.40	113.10	168.75	93.85	14.37	0.88	2.76	355.13	0.00
	Spot	118.17	112.50	171.05	93.25	14.99	0.85	2.58	347.77	0.00
Lead	Future	129.76	126.50	171.90	0.00	18.35	0.17	2.97	12.26	0.00
	Spot	129.58	126.35	171.90	0.00	18.75	0.19	2.87	16.34	0.00

Notes: Descriptive statistics calculated on both spot and futures price series. Std. dev. indicates the standard deviation. J-B indicates the Jarque-Bera.Source: Author's computations based on collected data from MCX.

For example, with the null hypothesis of no cointegration (r=0), the values of trace statistic and maximum eigenvalue statistic for copper are 84.384 and 76.824 which are greater than the critical values of 15.495 and 14.265 at 1% level. Therefore, the null hypothesis of zero cointegration is rejected and inferred a cointegration relationship. The results of one cointegrating vector reveal that the null hypothesis of one cointegrating vector can not be rejected at 1% significant level for sample commodities except copper; hence, indicating that spot and futures price series are cointegrated with one cointegrating vector except copper where more than one cointegrating vectors exist. But there can be only one cointegrating vector or long-run relationship between two non-stationary series. Hence, only one cointegrating vector is considered. Existence of cointegration among series implies the price transmission process which helps in price discovery.

VECM and granger causality test results

The trace test and maximum eigen test indicate that all price series are cointegrated implying a long-run relationship between the spot and futures prices of all commodities. when two series are cointegrated, then short run dynamics among the series is modeled applying VECM. The results of VEC Mobtained from equations 4 and 5 have been reported in table 4 (when the first differenced futures prices are dependent variable i.e., "F_t) and table 5 (when the first differenced spot prices are dependent variable i.e., "S_t). The error correction term coefficients are negative and significant for all commodities which implies the existence of bidirectional causalitybetween futures and spot prices in copper, nickel, zinc, aluminium and lead. In other words, when there will be disequilibrium in the short run, both spot and futures price series will adjust themselves to obtain the long run equilibrium. In addition to this, the magnitude of coefficients of error correction term determine speed of adjustment. In case of copper, nickel, zinc, aluminium and lead, $ë_S$ (-3.543;-3.573; -3.314; -2.537; and -2.722) is greater than $ë_F$ (-1.045; -0.615; -0.767; -1.202; and-1.229) in absolute terms, which indicates that spot prices makes a greater adjustment in order to re-establish the long run equilibrium as compared to futures prices. The speed of adjustment of futures market is slow and hence it becomes primary source of price discovery. It shows that the futures prices serves as effective source of price discovery and it is more efficient in reflecting new information in its prices compared to spot market. Thus, we can conclude that futures market plays a dominant role in price discovery process for all the sample commodities in the long run.

Table 3. Results of cointegration test

Commodity	Null Hypotheses	Eigenvalue	Trace statistic	C.V. 5%	p-Value	Max-eigen statistic	C.V. 5%	p-Value
Copper	r = 0	0.0312	84.384*	15.495	0.0000	76.824*	14.265	0.0000
	r ≤ 1	0.0031	7.560*	3.841	0.0060	7.560*	3.841	0.0060
Nickel	r = 0	0.0353	90.312*	15.495	0.0000	86.465*	14.265	0.0000
	r ≤ 1	0.0016	3.847	3.841	0.0498	3.847	3.841	0.0498
Zinc	r = 0	0.0485	122.217*	15.495	0.0001	120.016*	14.265	0.0001
	r ≤ 1	0.0009	2.201	3.841	0.1379	2.201	3.841	0.1379
Aluminium	r = 0	0.0189	55.517*	15.495	0.0000	51.313*	14.265	0.0000
	r ≤ 1	0.0016	4.204	3.841	0.0403	4.204	3.841	0.0403
Lead	r = 0	0.0345	90.750*	15.495	0.0000	84.693*	14.265	0.0000
	r ≤1	0.0025	6.057	3.841	0.0138	6.057	3.841	0.0138

Notes: (*) denotes significant at 1% significant level. C.V. stands for critical values.

Source: Author's Computations

Table 4. Coefficients of VECM

	Copper	Nickel	Zinc	Aluminium	Lead
Z_{t-1}	-1.045*	-0.615**	-0.767*	-1.202*	-1.229*
"FUTURES$_{t-1}$	0.07	-0.356	-0.236	0.164	0.242
"FUTURES$_{t-2}$	0.123	-0.326	-0.239	0.166	0.171
"FUTURES$_{t-3}$	0.142	-0.272	-0.230	0.126	0.151
"FUTURES$_{t-4}$	0.104	-0.251***	-0.229***	0.100	0.080
"FUTURES$_{t-5}$	0.133	-0.143	-0.162	0.088	0.086
"FUTURES$_{t-6}$	0.125	-0.06	-0.163**	0.021	0.055
"FUTURES$_{t-7}$	0.112***	-0.036	-0.085**	0.023	0.058***
"FUTURES$_{t-8}$	0.060***			0.031	
"SPOT$_{t-1}$	-0.954*	-0.504**	-0.652*	-0.985*	-1.045*
"SPOT$_{t-2}$	-0.868*	-0.407**	-0.487*	-0.777*	-0.877*
"SPOT$_{t-3}$	-0.723*	-0.346**	-0.383**	-0.662*	-0.735*
"SPOT$_{t-4}$	-0.624*	-0.289**	-0.273**	-0.527*	-0.567*
"SPOT$_{t-5}$	-0.551*	-0.263*	-0.171***	-0.440*	-0.443*
"SPOT$_{t-6}$	-0.430*	-0.140**	-0.104***	-0.299*	-0.289*
"SPOT$_{t-7}$	-0.267*	-0.068**	-0.061**	-0.239*	-0.153*
"SPOT$_{t-8}$	-0.122*			-0.141*	

Note: (*),(**) and (***) showslevel of significant at 1, 5 and 10 percent, respectively. Optimum lag length has been decided using Akaike Information Cruteria (dependent variable is " futures price).

Source: Author's computations based on data collected from mcx.

Granger causality test is used to understand the short run lead-lag relationship between the futures and spot markets of all the sample commodities and the results are presented in table 6. The results show that the value of chi-square for both equations is significant at 1% level. Hence the null hypotheses of both equations (equation 7 and 8) are rejected which indicate the existence of bidirectional granger causality between spot and futures prices for all the price series.Thus, prices in both spot and futures markets are capable to predict the prices of other market. However, futures markets are dominant as the chi-square values of futures markets are high for all the commodities.

Table 5. Coefficients of VECM

	Copper	Nickel	Zinc	Aluminium	Lead
Z_{t-1}	-3.543*	-3.573*	-3.314*	-2.537*	-2.722*
"FUTURES$_{t-1}$	1.816*	1.891*	1.687*	1.038*	1.196*
"FUTURES$_{t-2}$	1.246*	1.314*	1.254*	0.774*	0.815*
"FUTURES$_{t-3}$	0.794*	0.844*	0.873*	0.501*	0.523*

Contd...

“$FUTURES_{t-4}$	0.439*	0.489*	0.567*	0.308*	0.325*
“$FUTURES_{t-5}$	0.204**	0.203*	0.339*	0.165**	0.184*
“$FUTURES_{t-6}$	0.038	0.079***	0.150*	0.085	0.067
“$FUTURES_{t-7}$	-0.027	-0.002	0.038*	-0.023	-0.013
“$FUTURES_{t-8}$	-0.018			-0.075*	
“$SPOT_{t-1}$	-2.733*	-2.710*	-2.539*	-1.963*	-1.945*
“$SPOT_{t-2}$	-1.988*	-2.001*	-1.908*	-1.452*	-1.427*
“$SPOT_{t-3}$	-1.404*	-1.418*	-1.426*	-1.086*	-1.016*
“$SPOT_{t-4}$	-0.961*	-0.954*	-1.014*	-0.805*	-0.725*
“$SPOT_{t-5}$	-0.601*	-0.537*	-0.637*	-0.558*	-0.451*
“$SPOT_{t-6}$	-0.326*	-0.260*	-0.388*	-0.378*	-0.263*
“$SPOT_{t-7}$	-0.113**	-0.107*	-0.172*	-0.215*	-0.100*
“$SPOT_{t-8}$	-0.034			-0.067**	

Note: (*),(**)and (***) showslevel of significant at 1, 5 and 10 percent, respectively. Optimum lag length has been decided using Akaike Information Criteria (dependent variable is “ spot price).
Source: Author’s computations based on data collected from mcx.

Volatility spillovers

The volatility spillovers between futures and spot market of five base metals commodities have been examined by analyzing daily return price series of sample commodities.The EGARCH (1,1) model has been applied and the results of EGARCH (1,1) model have been reported in the table 7. The coefficient of $á_f$ and $á_s$ are significant and shows the existence of persistence of volatility in spot and futures returns of respective metals. Persistence of volatility implies that since a shock occurred, it takes a long period of time to die out. The coefficient of $ã_f$ and $ã_s$ indicates the existence of leverage effect. These coefficients are supposed to be negative and statistical significant for the presence of leverage effect. There exist no leverage effect in case of base metals except lead. Bad news has greater impact on volatility than the good news in case of lead futures and spot returns only. The coefficients of v_f and v_s are very important because the coefficients of v_f and v_s explains the volatility spillover from spot to futures market or futures to spot market. It can be seen from the results that there exist bidirectional volatility spillover for aluminium, copper and lead and unidirectional volatility spillover for nickel and zinc.However, on the basis of magnitude of the coefficients of $v_f$and $v_s$it can be observed that volatility spillover from futures market to spot market is stronger for copper, lead and nickel. To check the robustness of EGARCH model, ARCH-LMis used to test the absence of ARCH effects in the residuals.The results ofARCH-LM statistics show that no serial dependence persists left in residuals. Thus, the EGARCH(1,1) model is reasonably well specified and most appropriate model to capture the ARCH effects.

Table 6. Results of granger causality test/block exogeneity Wald test

Commodities	Direction of causality	chi-square (χ)	d.f.	Probability value	Lead-lag result
Copper	Spot to Future	640.147*	8	0.0000	Bidirectional
	Futures to Spot	46.263*	8	0.0000	
Nickel	Spot to Futures	490.310*	7	0.0000	Bidirectional
	Futures to Spot	18.449**	7	0.0101	
Zinc	Spot to Futures	397.349*	7	0.0000	Bidirectional
	Futures to Spot	21.150*	7	0.0036	
Aluminium	Spot to Futures	331.839*	8	0.0000	Bidirectional
	Futures to Spot	88.746*	8	0.0000	
Lead	Spot to Futures	321.604*	7	0.0000	Bidirectional
	Futures to Spot	51.322*	7	0.0000	

Note: (*), (**) and (***) denotes significance at 1, 5 and 10 percent level respectively.

Source: Author's calculations

Conclusion, Policy Implications and Futures Research Direction

This study aims to analyze the price discovery process and volatility spillover mechanism in Indian commodity derivatives market for copper, nickel, zinc, aluminium, and lead over a period from January, 2011 to March, 2020. Daily closing prices of spot market and near month futures contracts have been used for this analysis.

Table 7. Results of EGARCH model

Commodity		σ	ω	γ	Á	V	ARCH-LM
Copper	Future	-0.42*	0.253*	-0.019	0.982*	0.005*	228.02(0.00)
	Spot	-0.58*	0.339*	-0.004	0.974*	-0.012*	13.94(0.305)
Nickel	Future	-1.64*	0.241*	0.028	0.883*	0.000	20.44(0.059)
	Spot	-4.95*	0.464*	0.04***	0.628*	0.002*	16.58(0.166)
Zinc	Future	-0.75*	0.198*	-0.020	0.951*	-0.0***	12.51(0.043)
	Spot	1.200*	0.230*	0.022	0.915*	-0.002	13.39(0.341)
Aluminium	Future	-3.11*	0.276*	0.037***	0.766*	0.048*	15.99(0.191)
	Spot	-1.25*	0.181*	0.018	0.909*	0.020*	14.43(0.274)
Lead	Future	-2.66*	0.302*	-0.05**	0.796*	0.010**	5.73(0.929)
	Spot	-2.13*	0.215*	-0.06**	0.834*	0.012*	6.12(0.910)

Note: Based on p-values *,**and *** indicates level of significant at 1, 5 and 10 percent, respectively. P- values are given in brackets. Coefficients are reported.

Source: Author's estimates

This paper analyzed the price discovery process and volatility spillover mechanism by employing Johansen cointegration test, Vector error correction model, Granger causality test and EGARCH (1,1) model. The results of cointegration test report that spot and futures prices series are cointegrated and share a long run equilibrium relationship. The results of VECM model indicate that bidirectional granger causality exist between spot and futures market suggesting that both markets are capable to predict the prices of other market. Though there exist bidirectional causal relationship between markets, futures market is found to be dominant as it is more efficient in incorporating new information in its prices compared to spot market. The results of granger causality test support the findings of VECM. The results of EGARCH model claim that volatility spillover exist from futures to spot market for copper, lead and nickel as the v_s is greater than v_f but reverse exist in case of zinc and aluminium. The findings of this study are in line with maximum empirical literature available on price discovery between spot and futures markets that reports the dominant role of the futures market.The possible reason for futures market dominating the spot market could be low margin requirements, large number of market participant, fewer short selling restriction and lower transaction cost. The findings related to price discovery and volatility spillovers may help the market participants like traders, investors and policymakers to decide their strategies and policies.The findings of this study enables the traders and investors to know that futures market of base metals reflect the new information first. Thus, investors can use the futures price to hedge price risk against adverse price movements.Besides, the better understanding of the relationship between these markets would be useful for the policy makers who are indulged in formulating policies for the stability in financial market.The markets of base metals are influenced by many other factors (except domestic spot price) like exchange rate, inflation, trade policies of the government and international base metals prices. The impact of these factors on different metal's prices can be analyzed in future.

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Effect of Productivity on Profitability of Selected Cement Manufacturing Companies in India: A Panel Data Analysis

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Absract: In the present paper an attempt has been made to examine the effect of productivity on profitability of selected cement companies. The study period was of five years from 2015-2016 to 2019-2020. Researcher has identified two important ratios to measure the profitability like Return on Capital employed and net profit ratio whereas researcher has taken material productivity ratio, labour productivity ratio, overheads productivity ratio and total productivity ratio as an independent variable. Correlation matrix has been calculated which indicates that Return on capital employed ratio has positive and significant relationship with overheads productivity ratio. Material productivity ratio and total productivity ratio have positive but insignificant relationship with return on capital employed. Labour productivity ratio has insignificant and negative relation with return on capital employed. Net profit ratio has positive and significant relationship with Material productivity ratio, overheads productivity ratio and Total productivity ratio. Pooled ordinary least square method and fixed effect method.The result of pooled ordinary least square method shows that labour productivity has significant affected to return on capital employed whereas material productivity ratio, overheads productivity ratio and total productivity ratio have insignificant effect on return on capital employed. Fixed effect mode shows that labour productivity ratio and total productivity ratio have been significant to return on capital employed. Another model was prepared by taking net profit ratio as dependent variable. The model suggests that material productivity ratio has been significant to net profit ratio whereas fixed effect suggests that productivity has insignificant effect on net profit ratio.

Keywords: Productivity, Profitability, Panel Data Analysis.

Introduction

Productivity is very important to increase the financial performance. Both productivity and financial performance are very important for the success of any organization. Productivity is concerned with efficient utilization of resources of

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firm. Productivity is the measure between input and output. Thus, it is well understood that there is a relationship between productivity and profitability. When resources are utilized efficiently it reduces per unit cost of production which leads to increase the profitability. However, there are many instances that many firms which could increase profitability with poor productivity. It is a fact that by increasing selling price, profitability can be increased. However, productivity needs long term attention (Chew, 1989, Song, 1990). Generally increased productivity decreases the cost production per unit. Sometimes the result is on the contrary increased productivity does not always reduced cost of production per unit. Krugman (2009) stated that productivity matters a lot in long run but in short run it may not be effective. He also emphasised that living standard of the people can be increased by increasing labour productivity. Giulio et al. (2008) worked on productivity, profitability and financial performance, they have selected Italian manufacturing firm for the study during the time period of 1998 to 2003. They have also panel data analysis. They concluded that profitability and productivity are related to the growth of selected Italian firm. Phong et al. (2019) did research on the relationship between productivity and performance of firm selected from Vietnam stock exchange. The study period was of 2010 to 2017.They concluded that performance of the firm can be increased by increasing labour productivity. Hannu (1995) worked on the effect of productivity on profitability a case study by using activity-based costing approach. He concluded that changes in productivity affect the profitability of firm. Muthukrishnan (2002) did research on a case study on productivity in cement industry in Tamilnadu and concluded that increased productivity increases living standard and also increases the export of cement products. Taslim et al. (2014) worked on productivity and profitability analysis of eastern Refinery limited during the study period of 2007-2008 to 2011-2012. They concluded that profitability and total productivity of selected company are not good but labour productivity is very good.

Problem Identification

It is the fact that the competiveness of firm depends on the productivity and profitability of the firm. Production cost determines price of the cement products. Now a day market is very competitive and in such competitive market it is very difficult to increase market price of the cement product. Otherwise increasing market price profit can be increased. But another option is left open and that to decrease the cost of the production. Material and labour cost is the maximum cost incurred in production of cement. Again lime stone as raw material is available in limited quantity and scarcity of raw material prevails in the market. The firm has to become efficient to produce maximum by utilizing minimum resources. There are various ways to improve the efficiency (1) updating plant with modern

technology (2) increasing labour productivity by providing training to the existing labour forces. There is also hurdle in updating plants because it needs huge amount to be spent on long term base which may not be affordable. Moreover, after globalization it is very difficult for domestic firm to compete against the multinational companies. The best ways to increase the financial performance is to increase the material productivity labour productivity, overheads productivity by increasing efficiency of the existing plant.

Objectives of the Study

The main objectives of the study are:

- To analyze productivity of selected cement companies
- To measure profitability of selected cement companies
- To examine the correlation between profitability and productivity of selected cement companies.
- To as certain the effect of productivity on profitability of the selected cement companies.

Research Methodology

The secondary data has been taken form financial statements of respective companies and money control.com. The time period was from 2015-16 to 2019-20. Five years periods have been selected because it is justifiable from the point of view of Descriptive statistics and moreover past five years data are demanded by the banks while sanctioning long term loans. Cause and effect relationship has been measured between dependent variables and independents variables. The sample size was of five cement manufacturing firms namely (**1)** Ultra tech Cement (2) J.K. Cement (3) Indian Cement (4) Sanghi Cement (5) Saurashtra Cement.

Tools, Techniques and Model

Data analysis has been done through different accounting ratio calculated by formula. Statistical tools like descriptive statistics; correlation matrix, Pooled Ordinary Least Square Model, Hausman Test, Random effect model and fixed effect model have been used.

Researcher has selected five independent variables which are impacting on financial performance of selected firms from the review of literature.

1. $ROCE = \beta_0 + \beta_1 (MPR) + \beta_2 (LPR) + \beta_3 (OPR) + \beta_4 (TPR) + \mu it$
2. $NPR = \beta_0 + \beta_1 (MPR) + \beta_2 (LPR) + \beta_3 (OPR) + \beta_4 (TPR) + \mu it$

Dependent variables	Description
ROCE	Return on capital employed= EBIT / Capital Employed
NP	Net profit ratio= Net Profit / Sales * 100
Independent variables	
MPR	Material productivity ratio= Value of sales/ Material cost
LPR	Labour productivity ratio=Value of sales/ Labour cost
OPR	Overhead productivity ratio=Value of sales/ Overheads cost
TPR	Total productivity ratio= Value of sales/ Material cost+ Labour cost+ Overhead cost

Data Analysis

Table 1: Descriptive statistics

Statistics	ROCE	NP	MPR	LPR	OVR	TPR
Mean	10.34	5.87	7.30	15.90	1.70	1.19
Median	9.90	6.32	6.36	15.29	1.63	1.21
Maximum	22.24	13.42	9.96	25.46	2.02	1.28
Minimum	-1.17	-0.78	5.14	12.03	1.34	1.00
Std. Dev.	5.63	3.74	1.74	3.08	0.20	0.07
Skewness	0.31	-0.02	0.24	1.19	0.09	-0.99
Kurtosis	2.65	2.25	1.39	4.62	1.71	3.55
Jarque-Bera	0.54	0.58	2.95	8.61	1.78	4.41
Probability	0.76	0.75	0.23	0.01	0.41	0.11
Sum	258.62	146.79	182.50	397.62	42.59	29.80
Sum Sq. Dev.	761.83	335.86	72.39	227.66	0.95	0.11
Observations	25.00	25.00	25.00	25.00	25.00	25.00

(Source: Computed from annual reports of respective companies)

Table-1 shows descriptive statistics of selected cement companies. Mean of Return on capital employed was 10.34% and Standard deviation was 5.63 which show less fluctuations. Jarque –Bera shows goodness of fit. The mean value is 0.54 which shows that the errors in data are normally distributed. Kurtosis measures how heavily the tails of distribution differ from the tails of a normal distribution. The range of kurtosis is within the limit which indicates lack of outliers. Skewness is positive 0.31 which indicates the tail on the right side of the distribution is longer. The skewness is also within range which shows data are fairly symmetrical. The mean of Net profit ratio indicates 5.87% and standard deviation is 3.74%

which shows low fluctuations in trend during the study period. Skewness is negative 0.02 which shows that longer tail on the left side of the distribution. Negative skewness is also not good. Jarque –Bera shows 0.58 which is also in range. This means that the data are normally distributed. The mean of material productivity ratio, labour productivity ratio, overhead productivity ratio and total productivity ratio are 7.30, 15.90, 1.70 and 1.19 respectively. The labour productivity is very good because of it is very high whereas overhead productivity ratio is not good because it is very low (1.70) which shows low labour efficiency. Even overall productivity ratio is also very low 1.19 which shows total efficiency very low. Standard deviation of material productivity ratio, labour productivity ratio, overhead productivity ratio and total productivity ratio are 1.74%, 3.08%, 0.20% and 0.07%.The standard deviation of labour productivity ratio is very high as compared to other's standard deviation which shows high fluctuation during the study period. Skewness of material productivity ratio is 0.24 which is within range which shows data are fairly symmetrical. Whereas skewness of labour productivity ratio is 1.19 which shows distribution is highly skewed. The distribution of overhead productivity ratio is moderately skewed. Total productivity ratio shows negative skewness which means that data that are skewed left. Kurtosis of labour productivity ratio is 1.39 which indicates distribution is highly skewed whereas kurtosis of labour productivity ratio is 4.62 which also displays distribution is highly skewed. The same kurtosis is found in overhead productivity ratio (1.71) which is more than one which indicates that data are not normally distributed. Kurtosis of total productivity ratio is also showing unsymmetrical distributed data.

Table-2 shows correlation matrix of selected variables. Material productivity ratio has positive correlation with labour productivity ratio, total productivity ratio and net profit which is also statistically significant at 1% level of significance. Material productivity has positive but insignificant relationship with overheads productivity ratio and return on capital employed. Net profit ratio has positive and significant relationship with Material productivity ratio, labour productivity ratio, overhead productivity ratio, total productivity ratio and return on capital employed. Return on capital employed ratio has also significant relationship with overhead productivity ratio. Total productivity ratio has positive and significant relationship with material productivity ratio, labour productivity ratio and overheads productivity ratio. Total productivity ratio has positive and significant relationship with material productivity ratio and overhead productivity ratio. In short, Net profit ratio and return on capital employed ratio have positive and significant relationship with overhead productivity ratio.

Table 2: Correlation matrix

Variables		MPR	LPR	OVR	TPR	ROCE	NP
MPR	Pearson Correlation	1					
	Sig. (2-tailed)						
LPR	Pearson Correlation	.529**	1				
	Sig. (2-tailed)	.007					
OVR	Pearson Correlation	.192	-.051	1			
	Sig. (2-tailed)	.358	.810				
TPR	Pearson Correlation	.686**	.484*	.625**	1		
	Sig. (2-tailed)	.000	.014	.001			
ROCE	Pearson Correlation	.243	-.264	.565**	.383	1	
	Sig. (2-tailed)	.242	.202	.003	.059		
NP	Pearson Correlation	.576**	.192	.415*	.518**	.652**	1
	Sig. (2-tailed)	.003	.359	.039	.008	.000	

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

*. Correlation is significant at the 0.05 level (2-tailed).

c. Listwise N=25

Table-3 shows the calculation of pooled ordinary least square method for regression. ROCE has been taken as dependent variable and material productivity ratio, labour productivity ratio, overhead productivity ratio and total productivity ratio have been taken as independent variables.

The table- 3 shows that return on capital employed has been positively affected by Material productivity ratio, overheads productivity ratio and total productivity ratio. However the effect of these ratios has been statistically insignificant. Labour productivity ratio affects negatively to return on capital employed and the effect has also been significant. Adjusted R^2 is 0.38 which shows that combine effect of all independent variable caused 38% variance to return on capital employed. The F test shows significant which means that the model is fit.

Hausman test: This test is useful to differentiate between fixed effect model and random effect in penal data analysis. The null hypothesis is selected model has random effect and alternative hypothesis is that the selected model has fixed effect.

Table 3: Pooled ordinary least square method

Dependent Variable: ROCE

Method: Panel Least Squares

Sample: 125

Periods included: 5

Cross-sections included: 5

Total panel (balanced) observations: 25

Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROCE	-17.92	20.18	-0.89	0.39
MPR	1.01	0.79	1.27	0.22
LPR	-0.91	0.40	-2.31	0.03
OVR	10.37	7.16	1.45	0.16
TPR	14.86	28.04	0.53	0.60
Root MSE	3.96	R-squared	0.48	
Mean dependent var	10.34	Adjusted R-squared	0.38	
S.D. dependent var	5.63	S.E. of regression	4.43	
Akaike info criterion	5.99	Sum squared resid	392.77	
Schwarz criterion	6.24	Log likelihood	-69.90	
Hannan-Quinn criter.	6.06	F-statistic	4.70	
Durbin-Watson stat	2.22	Prob(F-statistic)	0.01	

Table 4: Hausman test

Correlated Random Effects - Hausman TestTest cross-section random effects	
Test Summary	Cross-section random
Chi-Sq. Statistic	75.615
Chi-Sq. d.f	4
Prob.	0.00

The result of Hausman test shows that the calculated value of chi-square is 75.615 and P- value is 0.00 which is less than 0.05 which means that the test result is significant and alternative hypothesis is supported. The fixed effect has been selected.

Table 5: Fixed effect

Dependent Variable: ROCE				
Method: Panel Least Squares				
Sample: 1 25				
Periods included: 5				
Cross-sections included: 5				
Total panel (balanced) observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ROCE	-153.46	20.37	-7.53	0.00
MPR	-0.67	0.71	-0.95	0.36
LPR	1.14	0.37	3.11	0.01
OVR	15.46	15.00	1.03	0.32
TPR	104.23	28.46	3.66	0.00
	Effects Specification			
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
Root MSE	1.45		R-squared	0.93
Mean dependent var	10.34		Adjusted R-squared	0.86
S.D. dependent var	5.63		S.E. of regression	2.09
Akaike info criterion	4.61		Sum squared resid	52.23
Schwarz criterion	5.25		Log likelihood	-44.68
Hannan-Quinn criter.	4.79		F-statistic	13.59
Durbin-Watson stat	1.50		Prob(F-statistic)	0.00

The table- 5 shows fixed effect model reflecting ROCE as dependent variable and MPR, LPR, OPR and TPR as independent variables. The F- test shows calculated value 13.59 and P-value 0.00 which means that the result is significant indicating the model is fit. Adjusted R^2 is 0.86 which means that combine effect of all selected independent variables have been 86% on Return on capital employed.

Table-6 shows calculation of multiple regressions. Researcher has taken net profit ratio as dependent variable and material productivity ratio, labour productivity ratio, overhead productivity ratio and total productivity ratio as independent variables. The adjusted R^2 is 0.32 which means that all selected independent variables have caused combine effect of 32% on net profit ratio. The coefficient shows that Labour productivity ratio has positive and significant effect on net

profit ratio whereas labour productivity ratio, and total productivity ratio have negative effect which is statistically insignificant. The F test shows that result is significant which means that model is fit. Durbin-Watson value is 2.07 which indicate negative autocorrelation.

Table 6: Multiple regression

Dependent Variable: NP				
Method: Panel Least Squares				
Date: 05/05/17 Time: 22:28				
Sample: 1 25				
Periods included: 5				
Cross-sections included: 5				
Total panel (balanced) observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NP	-8.66	14.03	-0.62	0.54
MPR	1.28	0.55	2.32	0.03
LPR	-0.09	0.27	-0.33	0.75
OVR	6.32	4.98	1.27	0.22
TPR	-3.48	19.50	-0.18	0.86
Root MSE	2.76	R-squared		0.43
Mean dependent var	5.87	Adjusted R-squared		0.32
S.D. dependent var	3.74	S.E. of regression		3.08
Akaike info criterion	5.27	Sum squared resid		190.00
Schwarz criterion	5.51	Log likelihood		-60.83
Hannan-Quinn criter.	5.33	F-statistic		3.84
Durbin-Watson stat	2.07	Prob(F-statistic)		0.02

Net profit ratio has been taken as dependent variable.

Hausman test: This test is useful to differentiate between fixed effect model and random effect in penal data analysis. The null hypothesis is selected model has random effect and alternative hypothesis is that the selected model has fixed effect.

Table 7: Hausman Test

Correlated Random Effects - Hausman TestTest cross-section random effects	
Test Summary	Cross-section random
Chi-Sq. Statistic	17.051595
Chi-Sq. d.f	4
Prob.	0.0019

The result of Hausman test shows that the calculated value of chi-square is 17.05 and P- value is 0.0019 which is less than 0.05 which means that the test result is significant and alternative hypothesis is selected. The fixed effect has been appropriate.

Table 8: Fixed effect model

Dependent Variable: NP				
Method: Panel Least Squares				
Sample: 1 25				
Periods included: 5				
Cross-sections included: 5				
Total panel (balanced) observations: 25				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
NP	-69.05	23.26	-2.97	0.01
MPR	-0.38	0.81	-0.48	0.64
LPR	0.56	0.42	1.33	0.21
OPR	19.93	17.12	1.16	0.27
TPR	29.29	32.49	0.90	0.39
Effects Specification				
Cross-section fixed (dummy variables)				
Period fixed (dummy variables)				
Root MSE	1.65	R-squared		0.80
Mean dependent var	5.87	Adjusted R-squared		0.59
S.D. dependent var	3.74	S.E. of regression		2.38
Akaike info criterion	4.88	Sum squared resid		68.08
Schwarz criterion	5.51	Log likelihood		(48.00)
Hannan-Quinn criter.	5.06	F-statistic		3.93
Durbin-Watson stat	2.26	Prob(F-statistic)		0.01

Net profit ratio has been taken as dependent variable

Table 8 shows fixed effect model. The researcher has taken net profit ratio as dependent variable and material productivity ratio; labour productivity ratio, overhead productivity and total productivity ratio have been taken as independent variables. The regression model shows that adjusted R^2 is 0.59 which means that the combine effect of all selected independent variables has been 59% on the net profit ratio. F test is significant and shows the regression model fit. Durbin-Watson value is 2.26 which indicates negative autocorrelation. The effect of labour productivity ratio, overheads productivity ratio has been positive but statistically insignificant. Whereas the effect of material productivity ratio has been negative and insignificant on net profit ratio.

Conclusion

Productivity is related to profitability. Material productivity ratio and total productivity ratio have positive but insignificant relationship with return on capital employed. Labour productivity ratio has insignificant and negative relation with return on capital employed. Net profit ratio has positive and significant relationship with Material productivity ratio, overheads productivity ratio and total productivity ratio. Multiple regression models suggest that combine effect of independent variables have been 38% on return on capital employed. The coefficient suggests that only labour productivity ratio has significant effect on return on capital employed. The Hausman test suggests that fixed effect model is appropriate because alternative hypothesis has been selected. The fixed effect model indicates adjusted R^2 0.86 which means that independent variables have caused 86% variance in dependent variable (Return on Capital Employed). In another model net profit ratio has been taken as dependent variable and material productivity ratio, labour productivity ratio, overhead productivity ratio and total productivity ratio have been considered as independent variables. The coefficient value suggests that labour productivity ratio and total productivity ratio have significantly affected to net profit ratio. The result of the Hausman test has been significant and alternative hypothesis has been supported and fixed effect model remain appropriate. Fixed effect model wherein net profit ratio has been taken as dependent variable, suggests that adjusted R^2 59% which indicates that all selected independent variables have caused 59% variance in net profit ratio. The coefficient value shows that effect of all selected variables has been in significant.

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Interest of Consumers about Organic Food Products in Haryana

RUCHIKA AND MOHAN KUMAR

Abstract: The objective of this paper is to study the demographic attributes of consumers regarding their interest about organic food products. Researchers have taken a sample of 555 respondents for the analysis. The respondents for the study were chosen from the State of Haryana. Multistage stratified sampling technique was used for the study. Confirmatory Factor Analysis (CFA) was also used to verify and validate the structure of measurement items of consumers' interest. In demographic attributes gender and living area of respondents were studied. Further, 287 male respondents(51.71% of the total sample size) and 268 female respondents(48.28% of the sample size) were selected for the study.The sample comprises 286 rural area residing respondents (51.53%) and 269 urban area respondents (48.46% of the total sample size). Based on the gender and locality, statistical differences in consumers' interest regarding organic products have been analyzed by using independent t-tests.The study finds that respondents show interest towards organic food products. The study will be helpful to predict the scope of organic food products. The people who are interested in organic food products may be potential consumers for these products. Further it will encourage farmers to adopt organic farming as well as be helpful for government to make policies to promote organic food products in state of Haryana.

Key Words: Interest, Organic food, Respondents.

Introduction

There is a lively public debate whether or not organic food is healthier than conventional food. Research does not provide a clear answer. Some people think that use of synthetic pesticides and artificial chemical in food production leads to arousal of diseases from headaches to cancer and from birth defects to memory loss also. On the other hand, some people consider organic food products healthy, eco-friendly and tasty but these are costly as compared to conventional food items. Nowadays, organic farming is considered more ethical than conventional as it uses the organic pesticides which come from natural resources and are not

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harmful for soil and environment. Also, organically grown plants improve their production with vitamins, minerals and antioxidants. So, the organic food products are assumed to add social benefits viz. environmental benefits and personal benefits i.e. health benefits. Today not only the common people but government, corporate world, academicians and many private agencies are becoming aware about the ill effects of non-organic products and benefits of organic products.

Despite these facts,a few farmers have adopted the organic farming. Because the average yield in the organic farming is quite low which results in increase of the cost of these products. Accordingly, the prices of organic products also rises in comparison to non-organic products as the production in conventional farming is much higher due to higher use of pesticides, fertilizers etc. This bumper production is available at lower price and affordable by most of the people. But in present scenario the people have started to think about another aspect i.e. health aspect and no doubt organic foods are treated as healthy food in comparison to non-organic one.

Review of Literature

Sharma and Singpur (2018) conducted a study on consumers' perception and behaviour towards organic food in India. The study revealed that environmental issues, health and safety were the main factors which decide the preference of consumers to buy organic food. Priya andParmeshwari(2016) conducted a study to know the consumers' attitude towards organic food products and the demographic variables of the customers using organic products. The study showed that the people were aware about the organic products. Remarkably, a significant relationship was found between monthly income and expenses on organic products. 'Muhammad (2016) showed that food security is the key challenge which makes people turning towards organic products and organic farming is beneficial for the planet. The study concluded that the market of organic food will have to be established so that organic farmers can get an outlet for their products. Such efforts will support the organic farmers in gaining larger market share for their products. Annunziata et al.(2016) conducted a study in Southern Italy in 2016 which revealed that organic agriculture not only preserves the environment but it also improves public health,bringing significant benefits both to the economy as well as to the social cohesion of rural areas. The research assesses the impact of local origin consumer preferences for organic products using a conjoint analysis. Sarumathi S (2015) stated that the consumers in developed nations are more informed about organic products than developing nations. The study concluded that health is the prime factor to buy organic products. Hoppe et al (2013) stated that there was a positive relation between behavior and attitude of surveyed consumers. The study found that older

consumers are more likely to purchase from farmer's market and concentrate on collective issues rather than individual issues that are present in supermarket. Sangkumcholiang and Huang (2012) describes the existing situation of organic consumers in North Thailand. The prime factors for purchase of Organic food are health, environmental issue and support to local farmers. Bhaskaranet.al. (2006) showed that the environmentally sustainable food products are slow in demand because these products do not offer special benefits, these are highly expensive and customers do not trust on the claims made by the organizations.

Objective of the Study

The objective of the present paper is to examine the effect of gender and area of living on the interest of consumers about organic food products.

Research Methodology

The study is based on the data collected through primary survey. The type of research to be used is exploratory cum descriptive in nature. Primary data has been collected for the study which has been collected through structured questionnaire. The respondents were asked to report their interest regarding organic products on 5- Point Likert Scale ranging from strongly disagree (SD) to strongly agree (SA).

A sample size of 555 people has been taken for the present study. For the purpose of present study, the data was collected from 6 divisions of Haryana namely, Rohtak, Karnal Hisar, Ambala, Faridabad, Gurgaon. Multistage Stratified random sampling technique was used for the study while collecting primary data. The questionnaires were sent through mails randomly to target respondents. On an average 48 rural respondents were surveyed from each division. Similarly, about 45 urban respondents were surveyed from each division. Ultimately, 286 respondents were surveyed from rural area and 269 respondents from urban area.

Exploratory Factor Analysis (EFA)

Exploratory factor analysis is considered as an efficient data reduction technique. In this study, measurement scales of interest are subject to the exploratory factor analysis with the objective of reducing the large number of variables into a few major factors.

Factors of interest of consumers regarding organic products

Item no.	Factor & Variables
Purchase intention/PI	
01	I am willing to purchase organic food products
02	If available in the market, I'll definitely purchase the organic food products
03	I am ready to pay extra price for organic food products
04	I think retailers should increase the availability of organic food products
05	I enjoy purchasing organic food products
06	I'll purchase organic food products in future also
07	I recommend my friends and relatives to purchase organic food products
08	If someone seeks my advice, I'll suggest her/him to go for organic food products
Knowledge and engagement/KAE	
09	I have knowledge of organic food products
10	I have knowledge of process of producing organic food products
11	Consuming organic food products makes me happy.
12	I want to explore more things about organic food products.
13	I am willing to spend extra time in searching organic food products
14	I feel engaged while shopping organic food products
15	I keep searching the multiple sources to know more about organic food products
Health and positive effect	
16	I think it is good for my health to use organic food products
17	I think Organic food products are environment friendly
18	I understand theother importance of organic food products
19	Organic food products reduce pollution

By applying exploratory factor analysis the 19 items of interest of consumers regarding organic products was reduced to 3 major factors, namely, purchase intentions (PI) consisting 8 measurement items, Knowledge and engagement (KAE) consisting 7 measurement items and health and positive effect (HAPE) consisting 4 measurement items. Factor can be defined as the major dimensions of any construct that explains the relationships among the variables. These factors were retained on the basis of Eigen values. Only those factors having eigne value more than one were retained and used for further analysis. Principal component factor analysis with varimax rotation was applied to get the major dimensions of interest of consumers regarding organic products. Therefore researchers used varimax rotation that gives a clear structure by minimizing the cross loadings among variables. In an effort to get a better structure of variables,

factor loadings more than 0.50 were considered for the analysis. Factor loadings simply show the degree of relationship between variable and factor. Higher factor loadings mean stronger relationships between variables and factors. The results of exploratory factor analysis for both constructs under study showed that the factor loadings of all variables were significant and well above the minimum acceptable value. As there were no serious cross-loadings so the structures of variables for both constructs were clear and clean. Three major extracted factor of interest of consumers regarding organic products explained 77.705 percent of total variance. Similarly, four extracted factors of attitude of consumers regarding organic products explained 76.861 percent of total variance. From analysis point of view these values are very good.

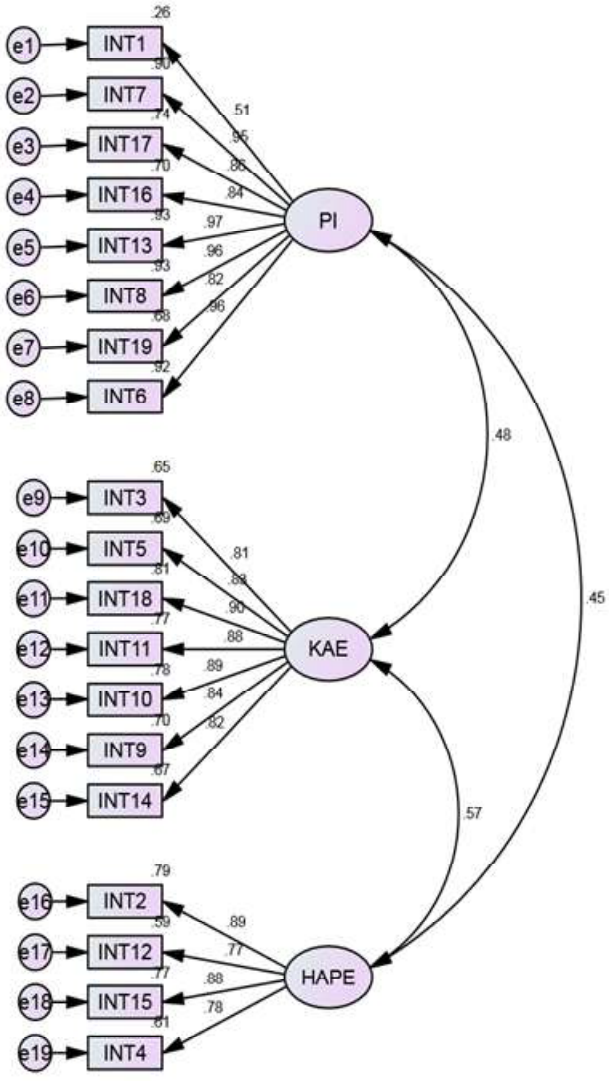
Confirmatory Factor Analysis for Interest of Consumers towards Organic Products

After applying exploratory factor analysis, researchers have also performed confirmatory factor analysis to verify and validate the structure of measurement items of consumers' interest. The process of testing the measurement scale of interest for validity and reliability aspects is known as confirmatory factor analysis. Confirmatory factor analysis shows the fit with which the measured variables represent the construct of interest. In other words, exploratory factor analysis helped in indentifying the structure of measurement items of interest while confirmatory factor analysis helped in confirming that structure. Therefore CFA is applied to confirm and validate the results of EFA. Confirmatory factor analysis is applied on 19 items representing 3 major dimensions. These major dimensions are named as purchase intentions (PI) consisting 8 measurement items,

Knowledge and engagement (KAE) consists 7 measurement items. Health and positive effect (HAPE) consists 4 measurement items. Researchers have used AMOS 18.0 to apply confirmatory factor analysis in this study.Proposed measurement model of consumers' interest towards organic products shows good model fit as value of CMIN/Chi-square is 685.758, Degrees of freedom are 149 and CMIN/DF is 2.602 (Figure 1). Further, the value of GFI is 0.868, IFI is 0.952, TLI is 0.945, CFI is 0.952 and RMSEA is 0.081 (Figure 1). The values of these indices are significant and above the minimum acceptable criteria thereby confirming the model fit of the first order confirmatory factor analysis for interest of consumers for organic products. Further, the standardized regression weights are significantly higher than the minimum acceptable value for all observed variables. The standardized regression weights varied between 0.51 and 0.97 (Figure 1)which are higher than the minimum acceptable range of 0.40 (Hair et.al, 2015). Hence, it can be said that confirmatory factor analysis confirmed the structure of three major factors of interest of consumers towards organic products.

Validation of the Measurement Model of Interest of Consumers towards Organic Products

Furthermore, the psychometric properties i.e. reliability and validity of measurement scale of interest of consumers towards organic products are also analyzed. Composite reliability (CR) values for all major dimensions of interest were between 0.898 and 0.961(Table 2). These values are significantly higher than the threshold limit of 0.70 of composite reliability. Composite reliability should be more than 0.70 (Hair et al.,2014).



CMIN/ Chi-square	685.758
DF	149
Probability level	.000
CMIN/DF	2.602
GFI	0.868
IFI	0.952
TLI	0.945
CFI	0.952
RMSEA	0.081

Figure 1: First order confirmatory factor analysis for interest

Source: Amos Output

From these results it can be concluded that the measurement scale of interest is reliable. Average variance extracted for all factors are significantly higher than the threshold value of 0.50 (Table 2) thereby, confirming the convergent validity for measurement scale of interest. It suggested that the latent variables accounted for more than 50 percent of total variance of their respective observed variables or items. To fulfill the condition of discriminant validity the AVE or average variance explained should be higher than the respective ASV or average shared variance for all factors.

Table 2: Validities

	CR	AVE	MSV	ASV	KAE	PI	HAPE	SQRT of AVE
KAE	0.949	0.726	0.327	0.278	0.852			0.852
PI	0.961	0.758	0.229	0.216	0.479	0.871		0.870
HAPE	0.898	0.689	0.327	0.265	0.572	0.450	0.830	0.830

In this study, all AVE values of factors are greater than their respective ASV values (Table 2) thereby, confirming the discriminant validity for the measurement scale of interest. The table depicts that for all factors of interest the CR, AVE, MSV and ASV values are acceptable. Based on this analysis, we can say that measurement scale for interest of consumers towards organic products has a good model fit and possess all psychometric properties essential for reliability and validity.

Extracted Factors of Interest of Consumers towards Organic Products

Purchase Intentions (PI): This is the first factor of interest that explained the extent to which organic product consumers have positive purchase intentions regarding organic products. This factor consisted 8 items measuring the purchase intentions of consumers about organic products. Standardized factor loadings of the observed variables loading on this factor were significant and varied from 0.51 to 0.97. The values of composite reliability (0.961), average variance explained (0.758), maximum shared variance (0.229), average shared variance (0.216) and square root of average variance explained (0.870) have shown that this factor of interest has required internal consistency, reliability and validity(Table 2).

Knowledge and Engagement (KAE): This is the second factor of interest that explained the extent to which organic product consumers are interested to have knowledge and to engage with the organic products. This factor consisted 7 items measuring the interest to have knowledge and engagement about organic products. Standardized factor loadings of the observed variables loading on this factor were significant and varied from 0.81 to 0.90. The values of composite reliability (0.949), average variance explained (0.726), maximum shared variance (0.327), average shared variance (0.278) and square root of average variance

explained (0.852) have shown that this factor has required internal consistency, reliability and validity (Table 2).

Health and Positive Effect (HAPE): This is the third factor of interest of consumers towards organic products. It explained the extent to which organic product consumers are interested towards health and positive effects of organic products. Standardized factor loadings of the observed variables loading on this factor were significant and varied from 0.77 to 0.89. The values of composite reliability (0.898), average variance explained (0.689), maximum shared variance (0.327), average shared variance (0.265) and square root of average variance explained (0.830) have shown that this factor has required internal consistency, reliability and validity (Table 2).

Table 3: Effect of gender on interest of consumer regarding organic products

Descriptive Statistics				
Factors/scale	Gender	N	Mean	Standard Deviation
Purchase Intention (PI)	Male	287	3.6385	1.12829
	Female	268	3.6558	.95534
Knowledge and Engagement (KAE)	Male	287	3.7496	1.03415
	Female	268	3.6951	.87345
Health and Positive Effect(HAPE)	Male	287	3.9556	1.00109
	Female	268	3.9655	.89525
Overall Interest	Male	287	3.7462	.89700
	Female	268	3.7355	.71782

One of the objectives of the present study is to study demographics profile i.e.gender and area of living of the consumers about organic products. For this purpose, t-test is applied to know the effects of gender in purchase intention, knowledge and engagement, health and positive effect and overall interest. Table 3 shows the descriptive statistics of different categories of respondents on the basis of their gender. Sample is divided into two groups on the basis of gender i.e., male and female. The total sample comprised the 287 male respondents and 268 female respondents. It is reflected from mean values of the different factors of interest that overall interest of consumer regarding organic products is high.

The table 4 shows the result of t-test regarding consumers' interest about organic products on the basis of gender. It is confirmed from p-value ($p>0.05$) there is no significant differences in purchase intention, knowledge and engagement, health and positive effect and overall interest on the basis of gender of respondents. So, hypothesis (Ha_1), there is no significant difference in consumers' interest

regarding organic products across gender is rejected. On the basis of mean value it is indicated that male respondents are slightly higher level of knowledge and engagement regarding organic products.

Table 4: Results of t-test across the gender

Factors/scale	Levene's test for equality of variances		t-test for equality of means		Mean difference
	F-value	p-value	T	p-value	
Purchase Intention (PI)	9.029	.003	-.195	.845	-.01728
Knowledge and Engagement (KAE)	7.613	.006	.673	.504	.05453
Health and Positive Effect(HAPE)	.833	.362	-.123	.902	-.00991
Overall Interest	10.007	.002	.156	.876	.01073

Table 5: Effect of area of living on interest of consumer regarding organic Products

Descriptive Statistics Factors/scale	Area of living	N	Mean	Std. Deviation
Purchase Intention (PI)	Rural	286	3.6613	1.07194
	Urban	269	3.6315	1.02252
Knowledge and Engagement (KAE)	Rural	286	3.8127	.95818
	Urban	269	3.6283	.95339
Health and Positive Effect(HAPE)	Rural	286	3.9738	.96004
	Urban	269	3.9461	.94206
Overall Interest	Rural	286	3.7828	.82696
	Urban	269	3.6965	.80059

For this purpose, t-test is applied to know the effects of area of living in purchase intention, knowledge and engagement, health and positive effect and overall interest. Table 5 shows the descriptive statistics of different categories of respondents on the basis of their area of living. Sample is divided into two groups on the basis of area of living i.e., rural and urban. The total sample comprised the 286 rural respondents and 269 urban respondents. The mean values for the different factors of interest and overall interest of consumer regarding organic products is high.

Table 6: Results of t-test across the Area of Living

Factors/scale	Levene's Test for Equality of Variances		t-test for Equality of Means		Mean difference
	F-value	p-value	T	p-value	
Purchase Intention (PI)	1.386	.240	.334	.738	.02977
Knowledge and Engagement (KAE)	.557	.456	2.272	.023	.18443
Health and Positive Effect (HAPE)	.241	.624	.343	.732	.02768
Overall Interest	.135	.713	1.248	.213	.08631

The table 6 shows the result of t-test regarding consumers' interest about organic products on the basis of area of living. It is confirmed from p-value for the factors, purchase intention, health, positive effect and overall interest there has no significant differences between rural and urban respondents. So, hypothesis (Ha_2), there is a significant difference in consumers' interest regarding organic products across area of living was not supported. But p-value for the factor, knowledge and engagement is 0.023 which is less that 0.05 indicates that there is a significance difference is found between rural and urban respondents. So, hypothesis (Ha_2), there is a significant difference in consumers' interest regarding organic products across area of living was supported for knowledge and engagement. On the basis of mean value it is indicated that rural respondents have slightly higher level of overall interest regarding organic products.

Conclusion

The study concludes that the overall interest of consumers about organic food is high. It does not matter whether they actually purchase these products. The study reveals that majority of respondents have showed the positive response i.e. interest regarding the organic food products. As far as gender is concerned, the male respondents show slightly higher level of knowledge and overall interest about these products though the difference is not much significant. With reference to the area of living i.e. rural and urban areas the respondents show a significant difference in knowledge and engagement regarding organic food. On the basis of mean value, it is found that rural respondents have higher level of interest about organic food products. The study implies that it will be helpful to predict the scope of organic food products. The people who are interested in organic food products may be potential consumers for these products. Further it will encourage farmers to adopt organic farming as well as be helpful for government to make policies to promote organic food products in Haryana.

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Measuring Purchase Intention for Organic Food: An Application of Theory of Planned Behavior

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Abstract: The consumer has become more aware of both personal and environmental health. This awareness has led to a change in consumer consumption pattern. The consumer is now shifting towards the organic food products that are beneficial for both human and environmental health. The present study aims to investigate the intention of the consumer towards consumption of organic food products using the constructs of Theory of Planned Behavior. The study was conducted using a structured questionnaire. The result of the data analysis revealed the predictive accuracy of independent variables to predict dependent variable, the fit of the research model and also the intent of the consumers to buy organic food products. The result indicates that constructs of Theory of Planned Behavior have significant impact on purchase behavior of modern consumers in context of organic food. The paper provides an insight of Indian consumers' intention towards organic food products. It would be fruitful to the marketers of organic food as modern consumers are more conscious about what they consume and can influence other consumers also to consume these products owing to the benefits that they provide.

Keywords: Organic food products, Consumer Behavior, Theory of Planned Behavior.

Introduction

Consumers are sensitive and aware about the implications and importance of the environmental values and want to purchase organic products and support eco-friendly business activities (Laroche et al. 2001). Food plays a crucial role in overall development of an individual, and organic products are healthier in comparison to non-organic products (Norman et al., 2000). Organic food reportedly changed consumer attitude by satisfying their hope (Adamtey et al., 2016).

Organic food refers to the product made in accordance with standards of organic agriculture that sustains and promote the welfare of soil ecosystems and humans

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(Vieira, et al., 2012). It is an improved version of conventional food where the beneficial components of the food are retained without the help of preservatives and other harmful activities or processes (Yi, 2009). The modern consumer is more alert and aware while shopping for food products. The reason of preference for organic food includes minimal use of chemicals; altered conventional food etc. is because of increasing concern for personal and environmental health (Magnusson, Arvola, et al. 2003). Purchase of organic food is motivated by positive consequences for self and others. The literature suggests that consumers sometimes relate feeling of good conscience and responsibility for well-being of one's family with organic food purchase decision (Bähr et al, 2004) and Baker, et al, 2004)).

Despite having knowledge and awareness regarding organic food, there is some difference in the consumer views regarding organic food and its attributes (Hughner, et al. 2007). Organic food consumers may also differ in terms of their basic values underlying food consumption, their lifestyle characteristics and purchasing patterns leading to differences in consumption behaviours among consumers. Studies have been conducted on profiling of organic food consumers on the basis of their psychographic and demographic uniqueness (Chinnici et al, 2002). Kriwy & Mecking (2012) reported that adequate growth in disposable income of a person leads to quality life and they can manage to pay high prices for organic food products. Yang (2017) found that eco-friendly activities and green product consumption trends are gaining importance.

Consumer information including awareness and preferences regarding organic food products in the developing world is undisclosed, a study of organic food demand particularly in developing markets is to be conducted to know the consumer preference pertaining to organic food products would be helpful for the growth of organic food market.

Review of Literature

In order to analyze the preference and attitude of the consumer towards organic food products a detail framework was designed. This framework is based on the Theory of Planned Behavior (Ajzen, 1991), it is a behavioral theory which helps to understand consumer Attitude, Subjective Norms and Perceived Behavioral Control.

Purchase Intention (PI)

Purchase Intention is the component of theory of planned behavior proposed (Ajzen 1991), it refers to the willingness to perform a particular act. Making a purchase of a green product or consuming a green product is different from having an intention of making such purchase or consuming such products. Green

purchase intention is also known as environmental concerns of an individual while showing a willingness to purchase.

Attitude towards organic food products

Consumer attitude towards purchase of organic food products is based on their awareness about the environment and health related issues. The consumer motives behind purchase and consumption of organic product is reported to have strong relationship with their attitude towards eco-friendly products (Testa et al, 2019). Magnusson et al., (2001) reported that consumer attitude have strong impact on purchase of organic product and intention to purchase organic product. Maloney, et al. (2014), found that consumer attitude towards green product influences the purchase intention and willingness to purchase the organic products.

H_1: There is a significant relationship between consumer attitude and purchase intention of organic food product.

Subjective Norms (SN) and organic food products

Subjective norm aims at determining the belief of a consumer about the expectations of its peer groups in context with a certain behavior, in this case intent to consume organic food is influenced by the society where an individual belongs. Ajzen (1991) explained that subjective norm refers to the social predictor of behavior that express the degree of social pressure perceived by an individual to perform or not to perform a certain behavior. Bamberg et al, (2007) discussed that individuals follow subjective norms not only because of peer pressure, but also due to the fact that it tells them what type of behavior is expected from them. Shahriari, et al, (2019) observed that subjective norms significantly influenced the consumer purchase intention towards organic food products. Maloney et al., (2014) observed an influencing role of subjective norms over purchase intention of organic apparels.

H_2: There is a significant relationship between subjective norm and consumer purchase intention of organic food product.

Perceived Behavioral Control (PBC) and organic food products

Ajzen (1991) refers to perceived ease or difficulty of performing the behavior and in the context of organic food consumption; it can be described as consumer perception towards green products and buying decision of such products. These perceptions can include expensiveness of organic food as compared to non-organic and limited availability (Tarkiainen & Sundqvist, 2005). Thøgersen (2009) observed that perceived barriers (price, product accessibility/availability) and perceived ability (financial resources) are the elements of perceived behavioral

control which significantly affect the buying behavior of a consumer for organic food products. Perceived barriers are significant obstacles that hinder organic food consumption (Laskova 2007).

H_3: There is a significant relationship between perceived behavioral control and consumer purchase intention of organic food product.

Objectives:

The objectives of the study are as follows:

- To examine consumer attitude towards organic food products.
- To analyze the relationship between consumer attitude and purchase intention of organic food products.

Research Methodology

In order to accomplish the objectives of the study an extensive research design was applied as follows:

Scale used: A structured and standardized questionnaire was used to collect the data; first part of the questionnaire was on consumer attitude towards organic food products developed by Taylor and Todd (1995). The second section of the questionnaire was on subjective norms, this was adopted from Vermeir and Verberke (2008). The third section of the questionnaire was to measure consumer perceived behavioral control, this was adopted from Al-Swidi, et al. (2014). The fourth section was to measure consumer purchase intention and this scale was adopted from Lee, et al. (2010), Al-Swidi et.al (2014). Items of the questionnaire were constructed on a 5-point Likert type scale ranging from Strongly Disagree Strongly Agree. The demography of the respondents was also measured.

Data Collection: More than 500 questionnaires were distributed to the respondents over the social media platforms, through Google document. After thorough inspection, only 365 questionnaires were found suitable for analysis.

Analysis and Discussion

Gender: More than half (55%) of the respondents are female (Table 1).

Age: Majority (37%) of respondents belong to young age group (21-25 age group) and around one third (30%) of the respondents belong to age group of above 30 years.

Education: More than half (60%) of the respondents are highly educated with post-graduation degree.

Occupation: Majority (54%) of the respondents belong to service class families (Government and private sector services), and one tenth (10%) of the respondents have their own business.

Income: Around half (56%) of the respondents belong to middle income category (Rs.25,000 to Rs.1,00,000 monthly income), around one-third (36%) of the respondents are from low income group (under Rs.25,000 monthly income) and only 8% respondents are from high income group (more than Rs.1,00,000 monthly income).

Table 1: Sample profile

Variable	Category	Percentage
Gender	Female	55
	Male	45
	Total	100
Age	Upto 20 years	13
	21-25 years	37
	26-30 years	20
	Above 30 years	30
	Total	100
Education	UG	40
	PG	60
	Total	100
Family Occupation	Govt. Service	24
	Pvt. Job	30
	Business	10
	Others	36
	Total	100
Family Income	Under Rs. 25000	36
	Rs. 25001- Rs. 50000	40
	Rs. 50001- Rs. 100000	16
	Above Rs. 100000	8
	Total	100

Measurement Model Assessment

The data obtained with the help of the standardized questionnaire was analyzed using the ADANCO software (Henseler & Dijkstra, 2015). In order to check the cross loadings, reliability and validity of the scale, assessment of measurement model was done with the help of appropriate statistical tools.

Cross Loadings

In order to check the factor loadings for all the constructs a measurement model was assessed, the factors having more than 0.5 loading were found significant for analysis (Hair, et al. 2019). The construct reliability of the constructs is confirmed as all the items reflected the highest loadings on their respective constructs and comparatively lower loadings for other constructs (Table 2).

Table 2: Cross loadings

Items	AO	SN	PBC	PI
AO1	0.944			
AO2	0.936			
AO3	0.914			
SN1		0.854		
SN2		0.867		
SN3		0.881		
SN4		0.833		
SN5		0.850		
PBC1			0.720	
PBC2			0.826	
PBC3			0.787	
PBC4			0.756	
PBC5			0.711	
PBC6			0.567	
PI1				0.831
PI2				0.832
PI3				0.845
PI4				0.785
PI5				0.854
PI6				0.837
PI7				0.839

Note: AO=Attitude towards Organic food products, SN=Subjective Norms, PBC=Perceived Behavioral Control, PI=Purchase Intention.

Reliability and Validity

After assessing factor loadings, the measures of internal consistency (reliability and validity) was administered, the values of all the measures of internal consistency are found significant, convergent validity was measured for each construct with the help of Average Variance Extracted (AVE). The value of AVE for each construct was above the minimum threshold limit of 0.50. (Table 3).

Table 3: Reliability and validity

Constructs	Items	Loadings	CR	AVE	Cronbach's Alpha	rho A
AO	AO1	0.944	0.952	0.868	0.924	0.929
	AO2	0.936				
	AO3	0.914				
SN	SN1	0.854	0.933	0.734	0.910	0.913
	SN2	0.867				
	SN3	0.881				
	SN4	0.833				
	SN5	0.850				
PBC	PBC1	0.720	0.873	0.536	0.825	0.840
	PBC2	0.826				
	PBC3	0.787				
	PBC4	0.756				
	PBC5	0.711				
	PBC6	0.567				
PI	PI1	0.831	0.940	0.692	0.926	0.927
	PI2	0.832				
	PI3	0.845				
	PI4	0.785				
	PI5	0.854				
	PI6	0.837				
	PI7	0.839				

Discriminant Validity

The discriminant validity was measured with the help of Fornell and Larcker criterion (1981) and heterotrait-monotrait ratio (HTMT ratio) (Henseler, et al.

2015). As per the Fornell-Larcker criterion, for a particular construct, the AVE should be higher than its value of squared correlations with other constructs. For HTMT ratio values should be less than 0.85 (Henseler et al., 2015). To establish discriminant validity criteria were fulfilled (Table 4).

Table 4: Discriminant validity

Heterotrait-Monotrait Ratio

Construct	AO	SN	PBC	PI
AO				
SN	0.604			
PBC	0.603	0.621		
PI	0.698	0.617	0.654	
Fornell-Larcker Criterion				
Construct	AO	SN	PBC	PI
AO	0.868			
SN	0.308	0.734		
PBC	0.292	0.295	0.536	
PI	0.423	0.326	0.338	0.692

Squared correlations; AVE in the diagonal.

Structural Model Assessment

As the data was found significant on measurement of assessment model the structural model was tested. It indicates that the consumer attitude, subjective norms and perceived behavioral control play a significant role in purchase intention of green products, t value is found significant. Similar findings were reported by Magnusson et al., (2001); Tarkiainen & Sundqvist, (2005); Maloney et al., (2014); Testa et al. (2019) for attitude, Maloney et al., (2014); Shahriari, et al. (2019) for subjective norms and by Tarkiainen & Sundqvist, (2005); Testa, et al. (2019) for perceived behavioral control, (Table 6).

It was observed that the relationship between AO and PI stands out to be most significant (Beta=0.395, p=0.000), followed by PBC (0.250, 0.000), SN (0.216, 0.000). The value of R square is 0.525 which indicates that attitude, subjective norms and perceived behavioral control contributes approximately 53% to purchase intention of a consumer towards purchase of organic products.

The threshold values of Cohen's f^2, (Cohen, 1988) are 0.02, 0.15 and 0.35 respectively signifying weak, moderate and high importance of construct in determining the dependent variable. The construct of AO showed moderate

effect in determining PI, while PBC and SN showed weak effect. On the basis of above analysis all the hypotheses were accepted (Table 5 and Fig.1).

Table 5 Structural model

Effect	Beta	Std error	t-value	P	Confidence Intervals		Cohen's f^2	Adjusted (R^2)		Decision
								2.5%	97.5%	
H_1: AO -> PI	0.395	0.049	8.146	0.000	0.299	0.486	0.201	0.525	0.522	Supported
H_2: SN -> PI	0.216	0.051	4.213	0.000	0.115	0.310	0.060			Supported
H_3: PBC -> PI	0.250	0.052	4.790	0.000	0.152	0.357	0.082			Supported

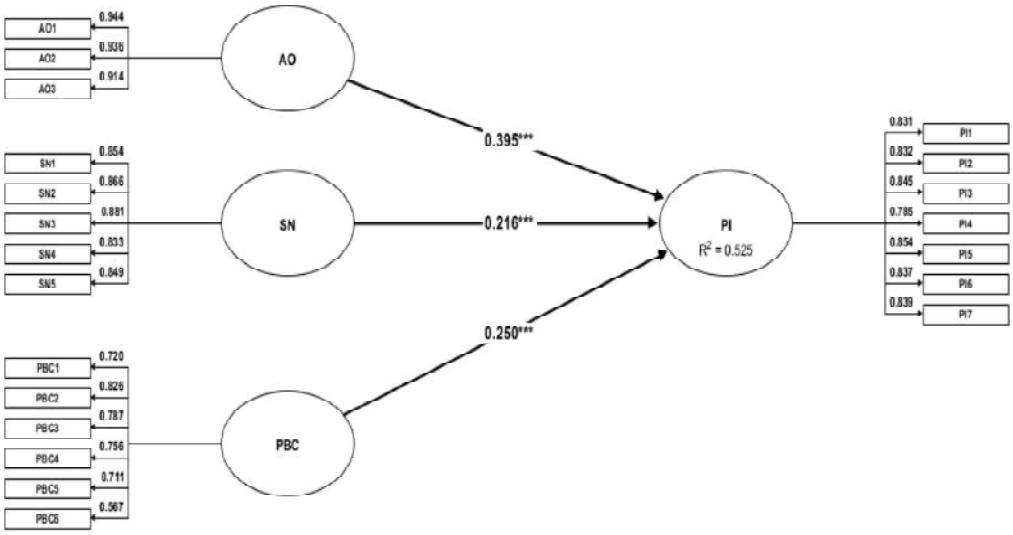

Figure 1: Research Model

Model Fit

The model fit was assessed with the help of Standardized Root Mean Square Residual (SRMR) index, the estimated values of SRMR= 0.056, d_{ULS}= 0.714 and d_G= 0.331, was found equal to saturated values, which indicates significance relationship of the independent and dependent variables of the model as there is no difference between estimated values and saturated values. The difference between estimated and saturated model should be minimum and the SRMR values should be less than 0.08 (Henseler, et al. 2016) (Table 6).

Table 6: SRMR model

Estimated				Saturated			
	Value	HI95	HI99		Value	HI95	HI99
SRMR	0.056	0.045	0.048	SRMR	0.056	0.045	0.048
d_{ULS}	0.714	0.472	0.523	d_{ULS}	0.714	0.472	0.523
d_G	0.331	0.243	0.259	d_G	0.331	0.243	0.259

Conclusion

On the basis of the above results it can be concluded that Attitude and perceived behavioral control are important predictors of the purchase intention. The purchase of organic food products is based on the basis of consumer attitude and their perceived control over purchase behavior. The components of consumer purchase intention, as mentioned in Theory of Planned Behavior, significantly influence the consumer intention for organic food, however their influencing power may differ based on culture and demographics of the respondents under consideration. The findings of the study are consistent with the literature confirming the significant influence of TPB constructs on the purchase intention, as the alternative hypotheses are supported. Behavior of consumers is also influenced by subjective norms, the consumer decisions are highly influenced by the opinion of their peers and colleagues. They can replicate their decision of consuming/buying organic food with their friends. Perceived Behavioral Control also influenced significantly the consumer behavior towards purchase of organic food products. It can therefore be inferred that consumers believe they have the control over their consumer willingness to adopt the organic food products which is not influenced by its high prices, as cost of a green product is not seen a barrier for the consumers.

Implications and Limitations

The marketers need to pay an emphasis on the green behavior of consumers towards organic food products, as they are more alert and aware about the products that they consume/buy. This is important for the marketers if they positioned their product as green or eco-friendly it will help to win this globally competitive market as consumers will spread a positive word-of-mouth about the products they consume, especially the products that they understand is beneficial and less harmful to the society and environment.

The study made an effort to gain insight into Indian consumers' approach for organic food items with the application of the basic Theory of Planned Behavior model. While strengthening the body of literature, it also acts as a limitation of the study therefore providing a window of opportunity for future researchers.

Future studies should aim at testing the TPB model in an extended form, i.e. by including new constructs to it. Constructs such as environmental concern, health consciousness, willingness to pay, etc. can be included in the extended form of TPB model. Further interrelationships among the TPB constructs (both basic and extended forms) can also be area of investigation for future researches.

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Factors Influencing Adoption of Mobile Banking Apps in India: Moderating Effect of Age

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Abstract: Banking sector in India has been witnessing transformation every day. This sector is probably one of the most dynamic sectors. One of the recent technological advancements introduced in banking service delivery is the mobile banking apps. The process of adoption of mobile banking apps also follows the "Technology Acceptance Model" (TAM) like the other technologies. The present paper is empirical in nature and finds the impact of major aspects of TAM and other similar models on consumer's intention to adopt the mobile banking apps. The constructs are – "Perceived Usefulness" (PU), "Perceived Ease of Use" (PEOU), "Social Influence" (SI) and "Behavioral Intention for using Mobile Banking Apps" (BI). The data were collected from 304 banking customers whose banks offer mobile banking apps. Data analysis techniques applied were Confirmatory Factor Analysis, Structural Equation Modeling and Categorical Moderator.

Keywords: Technology Acceptance Model, Mobile Banking Apps, Confirmatory Factor Analysis, Structural Equation Modeling

Introduction

Service delivery in banking industry has witnessed remarkable changes in the past two decades. Specifically, in the last decades, the customers' acceptability and usage has increased significantly for ATMs (Automatic Teller Machine), core banking solutions enabling any branch banking, e-banking and mobile banking. Amongst the technology based banking innovations mobile banking is the most prominent. App users can avail banking services irrespective of geographical location and time. It is more convenient than online banking (browser-based), where the password is always required as compared with figure print sensors or quick four digits IPIN. In order to gain competitive advantage and meet customer expectations, almost all banks and financial institutions in India have offered mobile banking services. Customer's adoption of internet

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banking could be influenced by many factors. Internet banking provides economy to the banking operations. Consumers must be briefed about the benefits of mobile banking so that more number of customers can be attracted (Jahagir and Parvez, 2012).

Classically as per the "Technology Acceptance Model" (TAM), the users' acceptance towards new technology depends upon "Perceived Usefulness" (PU) and "Perceived Ease of Use" (PEOU). The final TAM described that external influence drives to the (PU) and PEOU, which affects BI. BI further leads the Actual System Use. When users of mobile banking share about their experience on social media, it helps the other customers to adopt the same (Davis, (1989); Venkatesh & Davis, 1996).

Discussions on adopting technology-based services have become more relevant and sound with the emergence of "Unified Theory of Acceptance and Use of Technology" (UTAUT). It was in relation to the usage of technology by the older generation, Choudrie (2017) found the evidences of ICT digital divide specifically regarding the mobile banking. The author argued that to promote the adoption of new product, the disapproval of innovation by the customers must be recognized. Besides, resistance to new inventions, there is some disbelieves about new technologies by consumers, which may also lead to failure of invention. The author used UTAUT theory and age as a moderating variable to support the results. Mital et al. (2017) studied in the context of the "Internet of Things" (IoT) applying TAM and found that PBC ("Perceived Behavioral Control") is not a considerable factor for intention to use IoT. Sharma et al (2020) carried out a study from the perspective of a developing country (Fiji) with the constructs - perceived risk, customer satisfaction, and uncertainty avoidance. The author applied an extended version of 'UTAUT' and found that Internet Banking (IB) acceptability is in nascent even when the internet usage is on high level in Fiji. It was found that IB has positive effect on user behavior, which further influences the customer satisfaction positively.

Bankers are able to provide improved value to the customers through internet and mobile banking. Adoption of novel technology and customer value perception move simultaneously. The institutions have to set forth the efforts through classification of customer value along with adoption of technology experience among customers.The authors proposed and tested ITA model, which established how socio-economic features (family, age, income and qualification) personal disposition, PU, PEOU and facilitating conditions affect the customer value (CV), where CV was defined as the utility that a customer receives the banking technology innovation (Magotra et al., 2017).

Literature Review

Technology acceptance process has been an area of utmost interest among the researchers. In the changing times, TAM has been adopted, adapted, extended, and modified by many researchers in the field.The extant literature however, has never neglected the initial two constructs, i.e. PU and PEOU.

PU, PEOU, Perceived Risk (PR) and Satisfaction

Oliveira et al (2014) found that"Actual adoption of mobile banking" is affected by "Behavioral Intention" (BI), "Facilitating Condition"' (FC), "Technology Characteristics" (TC), "Performance Expectancy" (PE) and "Initial Trust" (ITrst). The substantial effect of all these factors validated the significance of the developed model. The usage of internet banking should be made easy and simple so that consumers feel comfortable and their level of involvement keeps increasing (Mann and Sahni, 2015).

George and Kumar (2013) examined customer's satisfaction with reference to Internet banking and the same has been done with the use of 'Technology Acceptance Model' (TAM). Construct "Perceived Risk" (PR) is tested with extended TAM model to find the positive effects of traditional TAM elements. It was found that on customer's satisfaction, PEOU and PU have encouraging effects, whereas PR has negative effects on satisfaction of customers. To maximize the satisfaction of customer and to change their perception of risk associated with internet banking, banks need to concentrate as the PR has come up as the strongest predictor determinant. 'Perceived Risk' (PR) has the lowest mean as compared to other predictor variables and thus provide little break for the banks. Though, in order to make customers feel safe to provide their private and personal information to operate internet banking, banks have great scope to develop that trust and enhance customer's satisfaction. Shankar and Datta (2018) found that there is a significant impact of PEOU, PU, "Trust" and "Self-efficacy"(SE) on the adoption of digital payments. 'Personal Innovativeness' (PI) and "Self-efficacy" (SI) have considerable impact on PEOU. Outcome of the study shows that "Personal Innovativeness" (PI) and 'Subjective Norms' (SN) influence PU. Important variables influencing payments through mobiles are PEOU and PU. User's preferences should be taken into consideration by the service providers of mobile payments with the information that have been gathered from this study.

Karjaluoto et al. (2014) examined the effects of "Personal Innovativeness", "Self-congruence", "Perceived Risks", and "New Product Novelty" on the perceived value as well as the effects of perceived value on the satisfaction and commitment of the customer. This study was carried out in Finland. As banking is moving

towards mobile channels in a speedy manner from other digital channels, it is important to determine effects in the context of "Mobile Financial Services Apps" (MFSAs)." Following three points are being highlighted as the findings of the study: (i) The major influence on PV in the MFSA reference is of "Self-congruence" and "New Product Novelty," (ii) As compared the mobile wallet users, PR delivers more impact on mobile banking users, (iii) The main driver of overall satisfaction is the utilitarian value and the stronger predictor commitment is hedonic value. There is a significant impact of pre-existing factors namely-"convenience," "efficiency,""trust," and"lifestyle" on the "attitude" about the acceptance of "mobile banking." The theoretical foundation of the study was based on TAM and "Diffusion of Innovations" (Chawla and Joshi, 2018).

Thakur (2013) studied the attitude of customers with reference to the mobile payment services in India and added to the TAM, UTAUT, DoI and associated studies about the acceptance of this new techniques. Outcome of research from distinct IS applications has validated TAM and UTAUT and has displayed the connectivity of these models in the assumption of elements that affect the attitude of customers of India towards mobile payment services. Secondly, it is found that this study is uniform and unchanged with prior researches, which review TAM as universally accepted and applied model to examine customer's attitude towards adoption of mobile payment services. Kumar et al (2017) worked on the intention of management students in India and the usage of mobile banking by them. Major elements that affect the usage and adoption of mobile banking among students were PU and PEOU, SI, and 'Trust Propensity' (TP). TAM model was built with PU and PEOU, and extended with SI and TP. It was found that the students of management perceive the use of mobile banking easy and comfortable. Ahmad et al. (2019) found that the transactions that are based on the internet are found to be easy as well as convenient to the customers. On the contrary, some customers feel that they may get a bad service that is why they hesitate in making use of online banking services. Study made a combined approach and used TAM theory to find out the effects of e-service quality on effective use of e-banking services. As per the result of the study, the quality of e-services has a considerable effect on the opinion towards using e-banking services. PU and PEOU leads to optimism towards e-banking services for the customers to find e-banking useful and easy. Behavioral intention also gets affected by PU. Behavioral intentions positively get affected by opinions directly affecting the adoption of e-banking.

Kassim and Ramayah (2015) studied that the considerable factors that affect the opinion towards the use of internet banking are civic risk, time loss risk; opportunity cost risk and perceived usefulness. Perspective is also a considerable element that can change the opinion of the customers to keep on using Internet Banking. The study recommends that "Internet Banking" (IB) services should be

taken seriously by banks. This study also shows that minimizing risk is necessary to motivate customers to continue using internet banking. Quality of internet banking system should be enhanced for which the strategies need to be developed by the internet banking service providers specifically to increase the usage of internet banking services.

Trust

Consumers' initial trust is formed by trust, perceived security, and privacy as three different constructs. In acceptance of e-banking, the major influence is of perceived security. Interesting result can be attained by the aid of government in developing countries has also been examined in the research (Susanto et al., 2012). Mobile banking is a growing service delivery programme and the e-Word of Mouth influences the intention of "adoption of online banking" positively. "ITrst" as a mediator "consumer involvement" (CI) as a moderator was taken and a moderated mediated model was proposed with "Elaboration Likelihood Model" (ELM) which predicted that e-WOM leads to e-WOM adoption. With reference to other products and service, e-WOM results as the "Intention to adopt online banking has also been investigated. It is significantly enhanced by the e-Word of Mouth, argument quality, consistency, and valence. This study was carried out in India and Australia (Shankar et al., 2020). Trust was found a key variable contributing in attracting new customers along with the good service quality in other similar studies (Sharma and Sharma, 2019; Shaikh and Karjaluoto, 2015).

This study was carried out in Finland. The study comprised of 11 models, theories and framework applied regarding the concepts, factors,and determinants that leads to the AoMB. The authors found that mobile banking is achieving great support in developing countries. Zhou (2012) found that, 'initial trust' needs to be built in users to motivate them towards AoMB. It was found that initial trust was developing through dual route - central and peripheral. In order to encourage initial trust of the users, the service providers should consider self-efficacy of the user.Bhatiasevi (2015)explored about the three constructs provided by the existing UTAUT model which are perceived cost, perceived credibility and convenience in order to find out the determinants that can lead to the acceptance of m-banking and also ascertain level of effect of all factor. The relationship that posed the supreme impact to adopt mobile banking is between 'perceived convenience' and 'behavioral intention'. So as to better understand the acceptance of internet banking, a multi-group analysis was executed by the researchers. Pravettoniet al. (2007) studied about the two-fold explanation that may be the reason for less usage of E-banking. The reason behind experts users are not using internet banking much may be that they do not trust internet banking and its technology, regardless of its inter-connective utility and convenience. Hence,

the factor that determines to actual usage of internet banking depends on trust. Trust is the most important factor in the adoption of internet banking, Usability may not be crucial factor. Usability factor may affect the e-banking behavior of the customer at second stage, when customer really start using e-banking services and at that time have an option to choose between traditional banking and internet banking.

Social Influence

Intention and use of internet banking services is affected by attitude, social influence, and intention. The culture leads towards the acceptance of new technology and also contributes towards the perceived risk, trust, and security with reference to the adoption of internet banking services. The study recommends researchers to put forth more focus on complexity of the technology, experience and security of financial transactions for their future studies (Bashir and Madhavaiah, 2014). Apart from the advantages that a mobile service offers but also the trust that user has on the service providers makes the user to adopt mobile banking. Decisions of youth while making the selection of mobile banking are influenced by their peers, references, not just the need, and the use. Hence, it can be concluded from the study that, in the adoption of mobile banking by youths, the major factor that influence them for the adoption are trust and social influence both change their attitude towards to acceptance of mobile banking (Bhardwaj and Aggarwal, 2016).

Mobile Banking Acceptance

Mobile banking is a form of online banking, in which, banking is essentially done through a mobile device using mobile banking app. Studies in adaptability of the online banking space found some unpredictable or even contradictory findings to one another, which made it challenging to takeout significant outcome from the studies.Montazemi and Saremi (2014)found that "structural assurance" leads to trust and PEOU leads to continuous intent to use the new technology.

Mobile banking is an extension of internet banking that facilitates consumers to make plenty of transactions. These transactions include - access to account information, opening deposits and liquidation third party transfers and many more. Hence, mobile banking is considered as the branch just a tap away from the customer. Shareef et al (2018) applied GAM (Generalized Additive Model) to measure behavior of consumers regarding mobile banking service delivery. The study finds that customers consider mobile banking as a unique service delivery channel. The mobile banking users' demand is uniform, identical, and general. In this study, the mobile banking service was categorized into three phases, which are static (here, consumer can check their account balance or

investment related information only), interactive (here, two-way communication can be done by the consumer with service providers) and transaction based (here, consumer can make transaction like bill payments, money transfer, etc.). Mobile payment has started getting attention of users as an alternative channel of financial transaction. Mobile payment adoption in India has not been explored yet. To bridge the gap and to explore the elements that determine acceptance of mobile payment in India, an extensive model has been developed (Shankar and Datta, 2018). As compared to the web platform of the mobile, the investment in mobile apps is motivated by the extent to which features of mobile phones are used.Data availability is another motive. The gap between mobile apps and mobile web are likely to expand further (Fenu and Pau, 2015).

Theoretical Famework

Figure 1 shows the theoretical model of the present study, wherein PU, PEOU, Trust and SI are the independent variables and BI is the dependent variable. Age has been taken as the moderator variable between all the relationships of independent and dependent variables.

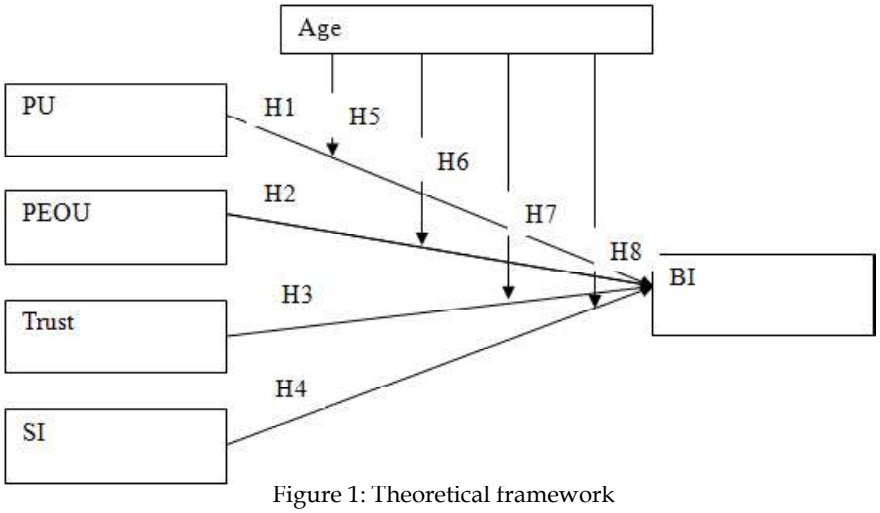

Figure 1: Theoretical framework

Objectives

The objectives of the study are:

- To find the influence of PU, PEOU,trustand SI on "Intention to adopt mobile banking apps".
- To ascertain the moderating effect of gender in the influence of PU, PEOU, trust and SI on "Intention to adopt mobile banking apps"

Hypotheses of Study

$H_{1:}$ PUpositively influences BI

$H_{2:}$ PEOU positively influences BI

$H_{3:}$ Trust positively influences BI

$H_{4:}$ SIpositively influences BI

$H_{5:}$ There is no moderation effect of Gender between PU and BI

$H_{6:}$ There is no moderation effect of Gender between PEOU and BI

$H_{7:}$ There is no moderation effect of Gender between Trust and BI

$H_{8:}$ There is no moderation effect of Gender between SI and BI

Research Design

The present study is descriptive in nature. The study empirically establishes the causal relationship among/between PU, PEOU, SI and Trust and Intention to adopt mobile banking apps.The study is based on the primary data collected through a structured questionnaire based on the scale given by Malhotra and Galletta (1999) in the context of TAM. The data has been collected from 304 respondents. Initially, the questionnaire was circulated to around 1,200 respondents out of which only 381 responses were obtained and 304 were found fit for the study and rest of the responses were unengaged responses. The responses were captured on a 7-point Likert scale. Only those respondents were chosen who had an actively running bank account for last 5 years with the bank that offered mobile banking apps. The questionnaire was circulated through Google forms and responses obtained were analyzed through SPSS and AMOS. CFA and SEM with Moderating variable have been used to analyze the data.

Data Analysis and Interpretation

Table 1 shows that with respect to the gender there are around 59% males and 41% females. The study represents all age groups of the respondents, wherein the maximum belong to the category of 35 to 45 (30%) followed by 45 to 55 (25%), 25-35 (19%), Below 25 (14%) and lastly Above 55 (11%). Around 53% of the Respondents are single, whereas 47% of the respondents are married. Most of the respondents have postgraduate or higher qualification (around 71%).

Table 1: Demographic profile

Categories	N	% Age
Gender		
Males	180	59.21
Females	124	40.79
Total	304	100.00
Age		
Below 25	42	13.82
25 to 35	59	19.41
35 to 45	92	30.26
45 to 55	77	25.33
Above 55	34	11.18
Total	304	100.00
Marital Status		0.00
Single	161	52.96
Married	143	47.04
Total	304	100.00
Education		
Bachelors or below	87	28.62
Postgraduate or above	217	71.38
Total	304	100.00
Income (INR per month)		
below 50,000	85	27.96
50,001 to 1,00,000	169	55.59
Above 1,00,000	50	16.45
Total	304	100.00

Scale Validation with Confirmatory Factor Analysis

The present study finds the influences of PU, PEOU, SI and Trust on the Intention to adopt Mobile Banking Apps. Table 2 presents the model fit indices and confirms that the values of all the indices fulfill the desired criteria. RMSEA below 0.05 is an indicator of a good fit (MacCallum et al, 1996).

Table 2: Model fit indices

Model Fit Indices	Values as per Model	Criteria	Criteria fulfilled
CIMIN/DF	1.686	≤ 3.00	Yes
CFI	0.986	≥ 0.95	Yes
GFI	0.917	≥ 0.90	Yes
AGFI	0.892	≥ 0.80	Yes
RMSEA	0.048	≤ 0.05	Yes

Figure 1 shows the measurement scale (First Order Confirmatory Factor Analysis) in which the correlations between items and constructs as well as covariance between constructs have been shown.

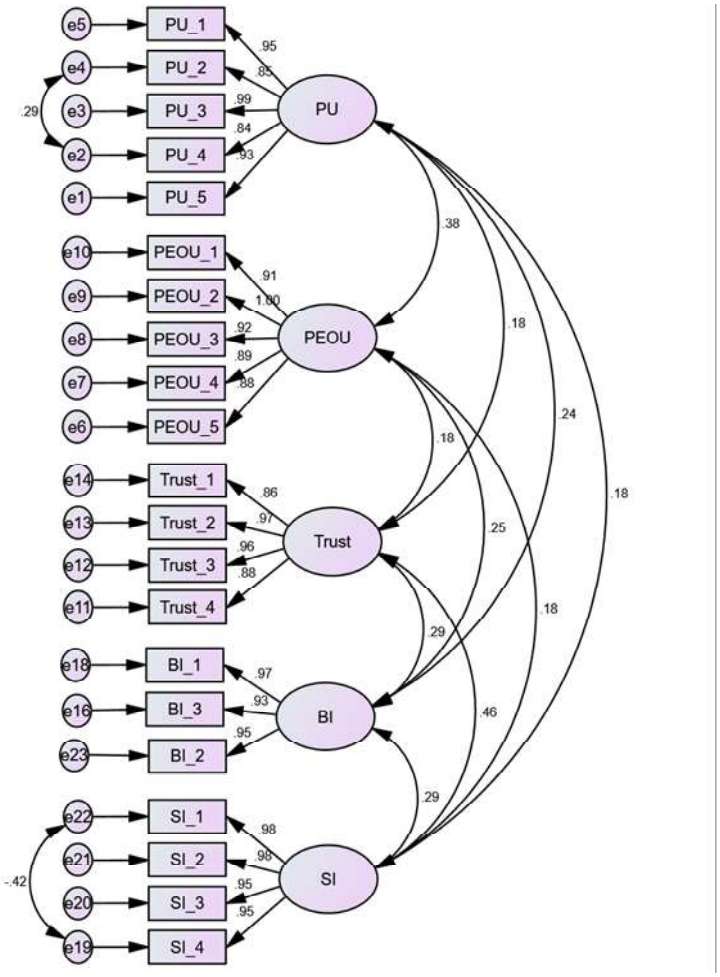

Figure 1: Measurement Model (CFA)

Table 3 shows the validity measure of the model. It is found from the table that composite reliability is above 0.7. It establishes the convergent validity. Similarly, ASV (Average Variance Explained) is above 0.5 which also determines the convergent validity. However, AVE is above MSV ("Maximum Shared Variance") and ASV ("Average Shared Variance") which establishes the discriminant validity.

Table 3: Validity measures

Constructs	Reliability (CR)	(AVE)	(MSV)	(ASV)
BI	0.965	0.902	0.086	0.073
PU	0.961	0.834	0.142	0.067
SI	0.982	0.932	0.209	0.090
PEOU	0.966	0.851	0.142	0.067
Trust	0.956	0.845	0.209	0.091

Figure 3 shows the SEM, which presents the relationship of all the independent variables with the dependent variable.

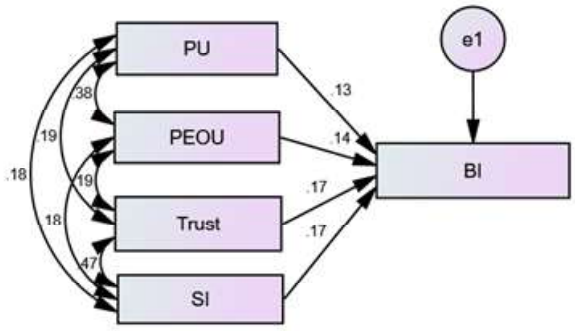

Figure 3: Structural equation model

Table 4 shows the output of the SEM; all the corresponding hypotheses have been supported. It is found that PU, PEOU, Trust and SI influence BI (Intention to adopt mobile banking apps) significantly.

Table 4: Results of causal relationships

Corresponding Hypothesis	Causal Relationship	Estimate	S.E.	C.R.	P
H_1	BI<—PU	.147	.064	2.311	.021*
H_2	BI<—PEOU	.172	.070	2.439	.015*
H_3	BI<—Trust	.169	.059	2.880	.004**
H_4	BI<—SI	.172	.060	2.862	.004**

*Significant at 5% ** Significant at 1%

Moderating Impact of Gender

The factors determining adoption of a technology are different for males and females. All the four causal relationships supported above have been checked separately for males and females both while taking 'Gender' as a moderating variable (Table 5 and 6) and significant different has been found for the impact of PEOU on BI (Table 7)

Table 5 shows that in the context of males, only PU and Trust have the significant influence on BI (Intention to adopt of Mobile Banking Apps).

Table 5: Regression weights for males

	Estimate	S.E.	C.R.	P
BI<—PU	.194	.082	2.378	.017
BI <—PEOU	.046	.083	.551	.581
BI<—Trust	.250	.074	3.374	***
BI<—SI	.134	.079	1.694	.090

Table 5 shows that in the context of females, only PEOU and Social Influence have the significant influence on Behavioural Intention (Intention to adopt of Mobile Banking Apps)

Table 6: Regression weight for females

	Estimate	S.E.	C.R.	P
BI<—PU	0.049	0.102	0.483	.629
BI<—PEOU	0.414	0.127	3.256	.001
BI<—Trust	0.041	0.094	.434	.664
BI<—SI	0.234	0.089	2.612	.009

Table 7: Moderation effect of gender

		Males			
	Causal Relationships	BI←PU	BI←PEOU	BI←Trust	BI←SI
Females	BI←PU	-1.109			
	BI←PEOU		2.427*		
	BI←Trust			-1.755	
	BI←SI				0.839

Critical value of Z = 1.96

Table 7 shows whether a moderation effect exists or not. However, the difference have been observed between males and females for all the four causal relationships, however, referring Table 7 it is found that in case PEOU affecting BI, there is a significant moderation effect of Gender. The calculated value of Z for difference for males and females is 2.427 which is more than the critical value of Z distribution viz. 1.96.

Findings and Conclusion

Acceptance of technology has been an area of utmost interest of researchers. The extant literature has identified a large number of variables that affect the technology acceptance in the various fields. Initially the 'Technology Acceptance Model' identified the basic variables such as PU and PEOU that determine the acceptance of people for a new technology. Later, the variables such as social influence trust, etc. were added by the budding researchers into this list. The present study re-confirms that PU and PEOU along with social influence and trust affect the behavioral intention, i.e. intention regarding adoption of mobile apps. The findings of this study are consistent with the earlier studies by Sharma et al (2020), (Susanto et al., 2012), Zhou (2012), andPravettoni (2007). This study also determines that on one hand males are more influenced by PU and Trust. However, females are more influenced PEOU and SI showing their intention to accept a new technology. The results are supported by many other studies carried out in past Shin (2009), Wang, et al. (2016) and Venkatesh & Morris, 2000. Banking customers have lot of hesitations while using internet banking. Mobile banking is an advanced form of internet based banking service delivery. It is more convenient, fast and instant, still not free from a large number of perceived risks and might be a nightmare of non-tech savvy consumers. Government, since demonetization days, has been promoting the digital payments through UPI and a large number of apps support such payment systems, which has increased the importance of mobile banking apps in India. Additionally, the customer should not be blamed for any loss occurring due to unlawful deals or system failure or downfall. Thus, the digital payments can make new developments and at the same time assists in the upgrading of payments disbursement in rural sectors (Singh and Malik, 2019).

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Impact of Personality Traits on Social Entrepreneurial Dimensions: An Empirical Study in India

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Abstract: Founders of social enterprises are comprised as population for the study, and 115 social entrepreneur approached from the list of 280 as sample for the study. Purposive sampling method is used as sampling technique. The scale for social entrepreneurial dimensions (Sustainability, Social vision, Social network, Innovation and Financial returns) as dependent variable is taken from the study of Nga and Shamugnatham (2010).For observed variable The Big 5 Personality traits, Openness, Extroversion, Agreeableness, Conscientiousness, and Neuroticism is adopted from Schmitt et al.(2000). The 5-point Likert scale is employed for all the constructs. Data analyzed using exploratory factor analysis for the dependent and independent variables separately whereas for hypothesis testing multiple linear regression (MLR) method is adopted.

The study concludes the impact of different SE dimensions on individuals personality reveals Extroversion as impactful personality trait impelling all social entrepreneurial dimensions excluding financial returns. Agreeableness has significantly positive impact on innovation and social network whereas Conscientiousness display significantly negative impact to sustainability and significantly positive impact on social network and financial return. Subsequently Openness has significantly positive impact on sustainability and Neuroticism has significantly negative influence on social network. These findings bring clear conclusion that personality traits of an individual highly influence the social entrepreneurial dimensions.

Keywords : Social entrepreneurship, SE dimensions, Personality Traits.

Introduction

Social entrepreneurial dimensions gained popularity in recent decades and are most debatable topic now a day, whereas personality traits are well known and established topic. Literature suggests that personality play distinguished role and is an important regulating factor for interpreting entrepreneurial attainment. Thus this study is aiming to observe a theoretical perspective of social entrepreneurship and personality within existing literature and directed to a

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pragmatic study about the subject. The three basic approaches of entrepreneurship study are: functional, personality and behaviour. The first addresses the relationship of an entrepreneur with their environment; the second emphasis on the unique characteristics of entrepreneurs; and the third conceptualises the actions of the entrepreneur (Cope, 2005). For this study we selected the personality approach to define the dimensions of social entrepreneurship.

The term social entrepreneurship is coined by Mr Bill Drayton founder of Ashoka in 1980 for the first time. Social entrepreneurs are the persons who create manage and lead an organisation that seeks to present innovative solution to worlds most pressing social problems like illiteracy, unemployment, starvation, poverty, environment degradation, inequality and ill-health or social exclusion (Mair & Marti, 2006). Social entrepreneurship may be understood as a process of innovation to mitigate the social problems and being self-sustainable on other hand. However recent policy attention has more narrowly focused on the role of social enterprises in work integration for vulnerable groups and as charitable organization. In broader sense social entrepreneurship can be distinguished at three levels: first individual level, second institutional level and last on societal level. For this research we studied SE at individual level or personality level, because personality have great influence on social entrepreneurial dimensions.

Personality traits may be defined as inward characteristics that influence individual attitudes, intentions, abilities, aptitude and behavior (Brandstatter, 2011). In the reference of social entrepreneurship personality can play a major role as only certain individual create social venture and benefit the society whether others are not, so it shows role of personality traits for their behavior. While it does not mean this inter-individual difference is only criteria for entrepreneurial behavior because according to ASA theory individuals are attracted to specific occupational choices (such as starting a social enterprise) because they perceive their personality characteristics, motivations, and skills to align with the requirements of that occupational choice (Schneider, 1987, Baron, Franklin, & Hmieleski, 2016). In this way the entrepreneurial process depends on the decisions of the entrepreneurs and these decisions are influenced by their personal characteristics (Shane et al. 2003). Social entrepreneurs are often distinguished by their ability to envision, engross, empower and endorse transformational change proficiently in the face of scarce resources, risks and miscellaneous contexts (Thompson et al, 2000).

However, the influence of personality traits has powerful impact in defining social entrepreneurs which has remained under-researched and under- explored and debatable. In the field of social entrepreneurship many researches have been done in accordance of personality but a few in Indian context. Where as in most

of the earlier researches the population of the study has been students (Nga and Shamuganathan, 2010) which can only give a probable trend of social entrepreneurs personality so taking that into consideration sample is collected from population of social entrepreneur in India. The conceptual framework was developed (Figure 1).

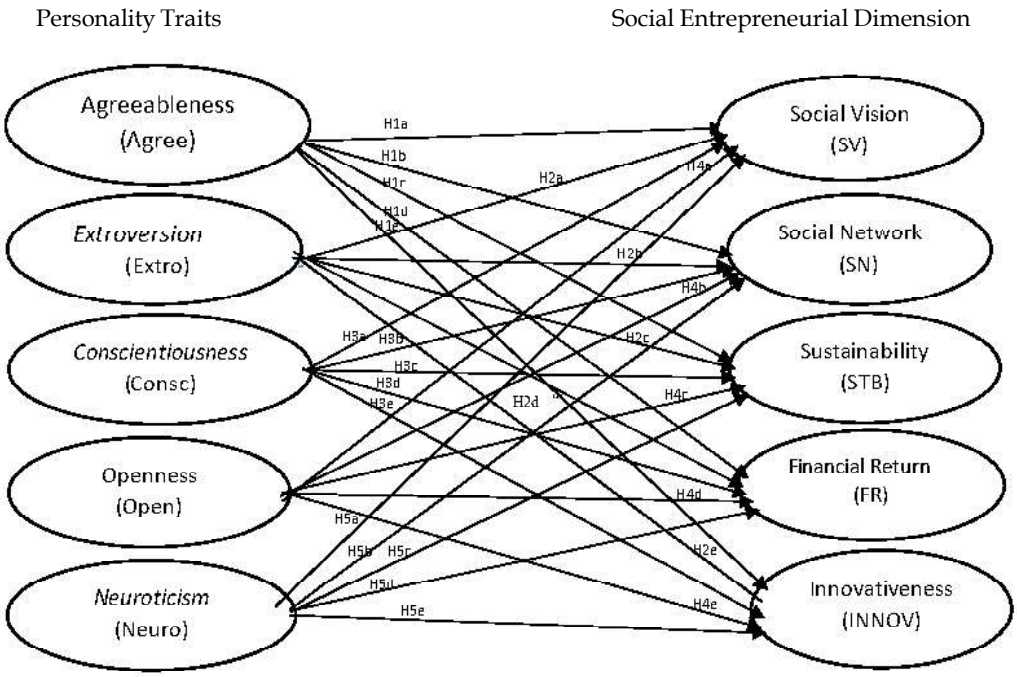

Figure- Conceptual framework for the study

Objective of the Study

The objective of this study is to explore the impact of personality traits on specified dimensions of social entrepreneurship.

Review of Literature

Review of Social entrepreneurial dimensions

Social entrepreneurship, broadly defined to encompass diverse and innovative models for combining business processes and practices with the achievement of social or environmental aims, is an expanding area of both research and activity. Social entrepreneurship may be defined as process of giving solution of most prevailing social problem by introducing innovative ideas in a sustainable way. In this respect social entrepreneurs are persons who can identify the opportunities,

grab such opportunities, bear risks and apply innovative techniques of venture modelling to achieve social value creation. However, the essential alteration between revenue oriented entrepreneurs and social entrepreneurs is indicated in the vision of their corporations social entrepreneurs seek to attain a social value and revenue making is a derivative product of their actions. (Dees, Elias,1998, Thompson, Alvy, and Lees (2000)

In this context, Social enterpreneur often display traits of emotional empathy, moral judgment, self-efficacy, social support, perceived desire and feasibility (Mair and Noboa, 2006). Based on Taheri entrepreneurship dimensions includes hardworking, risk-taking, self- confidence, creativity, flexibility, and tolerance of ambiguity (Taheri et al, 2010).Where as Social Entrepreneur Quotient, reveals it is a psychometric scale encompassing six dimensions of a social entrepreneurial personality: creativity, ethics, openness to change, risk-taking, autonomy, and achievement motivation (Pandey & Wade 2019).

According to Nga and Shamuganathan, (2010) social entrepreneurs are persons establishing and sustaining the entrepreneurship deeds which make innovative and self sufficient financial return by organising social networks in a sustainable way in view of a social vision. Nga and Shamuganathan (2010) investigated five dimensions of social entrepreneurs, namely social vision, sustainability, innovation, social networks, and financial returns, among students in Malaysia. Thus in this study dimensions developed by Nga and Shamugnatham (2010) has been adopted to study social entrepreneurship in Indian context.

Social Vision

Social vision is fundamental and foremost principal and obligation for social entrepreneurship differentiating it from other entrepreneurships like business and philanthropy. It is the sense of responsibility and emotional connection in pursuing a just social or environmental cause (Choi and Majumdar, 2014). Especially people who confronted problems in their childhood or youth have the tendency to prefer solving the social imbalance over financial income (Nga and Shamuganathan, 2010). This transformative belief leads SEs to develop human potential to replicate and reciprocate changes through meaningful social endeavors (Barendsen and Gardner, 2004). However, the core factor distinguishing the vision of social entrepreneurs and donations activities is the fact that social entrepreneur's ambition to get to the fundamental of the problem and try to build an innovative practice for resolution.

Sustainability

According to Brundtland report by WECD (1987), sustainable development is "development that can meet the essential needs of the current generations without frightening the facility of forthcoming generations to encounter their personal necessities". Sustainability is capacity of an organization to continue or survive over time. The sustainability in SE may be understand as a process that includes: the recognition of a specific social problem and providing innovative solutions to address it; by creating social impact. The nexus of sustainability describe social entrepreneurial organizations as sustainable ventures that embody a passion for social impact (Wolk 2008). It is also argued that the primary objective of social entrepreneurship is to create social value, and social entrepreneurs employ business concepts to sustain their operations as they pursue this objective (Swanson and Zhang 2010). They do so by putting new approaches and creating sustainable solutions to change society in a better way (Weerawardena and Sullivan Mort 2001).

Innovation

Innovation in the context of social entrepreneurship may be defined as, transformation of challenges into opportunities for new business, product and service (Drucker 2006) or it is "a noble solution to most prevailing social problems that is more efficient, effective, sustainable, and better than existing solution, and for which social value creation is primarily rather than benefit of privet individuals (Phills, et al. 2008). One of the famous journal of innovation, The Stanford Social Innovation (SSIR) that seeks to bring view of both academic and practitioners together defined innovation as, "the process of inventing, securing, support for, and implementing novel solutions to social needs" (Phills et al. 2008). Social innovation promotes creative thinking, collaborative action and innovative solution to the existing social problems (Nga and Shamugnatham, 2010).

Social Network

Social networks refer to personal relationship with one's circle of influence and social elements are critical to social entrepreneurs subsequently they provide important information, work force, innovative ideas, financial and social support. These relationships generate social capital in the form of potential synergistic benefits in the areas of information exchange, influence, reputation, as well as psychological and resource reinforcements (Irengun and Arikboga 2015). Today, the significance of social networks for social entrepreneurs visibly becomes apparent as they provide access to greater part of society. The social entrepreneur collaborating and adjoining its investment with other entrepreneurs in its environment will accelerate the share of information which consecutively will

enhance its status in the society and will contribute to its own business and others involvement in its social network (Nga and Shamuganathan, 2010).

Financial Return

For a social entrepreneur profit or financial return is not a tool which is employed for realizing their goals and mission but it keep them on their path of sustainable social change with measurable social impact. Today, the idea of leading self-sustainable expansion activity to generate revenue for creating social benefit is measured as an essential factor evolved which lead traditional non-profit organizations to social entrepreneurship. The social business model is a hybrid model that stresses self-sustainability in terms of financial resources, the social value maximization and repayment invested capital to the investors (Yunus et al., 2010). Thus social enterprises are that legal entity which trade for only social purpose, re-invest their all their turnover and profits into social welfare, and they are the self -accountable do not distribute their surplus into stakeholders and owners.

Review of personality traits

Specific personality dimensions of risk taking, motivation, locus of control, creativity, assertiveness, the need for achievement, innovation, independence, risk taking propensity, Type-A behaviour, and tolerance for ambiguity and initiative are some of the commonly and consistently found personality dimensions in groups of social entrepreneurs (Tracey & Phillips (2007); Brandstatter, 1997). Use of personality dimensions in screening and recruitment of individuals for specific roles was initiated by Cattell in 1946 who identified 16 distinct personality factors that may determine an individual's behaviours and performance in a role (Sahni et.al, 2018). There are some prominent personality traits observed in previous researches where the list of academics is not exhaustive, but represents an overall good review of the main characteristics of each personality traits.

Though there are abundant personality traits observed in literature but fail to develop a perfect measurement scale for each, thus this study focuses on investigating the influence of the renowned Big Five Model (BFM) for personality traits on the SE dimensions described earlier. Big five personality factors of agreeableness, extraversion, conscientiousness, openness and neuroticism, to experience were tested and re-tested and empirically confirmed to be associated with entrepreneurial personality by rigorous research studies (Goldberg, 1993, Zhao, Seibert, 2006, Nga and Shamugnatham 2010, Sahni et.al 2018).

Agreeableness

Pro-social behaviours, caring friendliness, gentle, compassionate, soft-spoken, cooperative, all these traits are the main component of agreeable personality dimension, which is helpful in developing positive inter-personal relationships. Highly agreeable people want to stay in consensus and 'be with the majority', all the time, thus avoid confrontations and conflict. People low on the scale of agreeableness are considered as self-centred, devious, and egoistic but they are competitive and relentless in working towards their goals, which is required for succeeding in entrepreneurial ventures (Rothman, Coetzer, 2003). On the other hand, highly agreeable people are the persons who are masters of understanding the problems of the others by their good communication skill and thus convince them for a better solution.

H1 (a), (b),(c),(d),(e) : Agreeableness has a significant influence on all the dimensions of social entrepreneurship.

Extroversion

Extroverted individuals are joyful, companionable, gregarious, friendly, passionate, assertive, sincere, optimistic, enthusiastic and efficient to put forth its point of view in front of others (Lewelyn and Wilson, 2003; Zhao et al., 2010) Extroversion quality of an individual is required to create and sustain social networks, hire people and establish strongly productive teams, stay in regular touch with other stakeholders, such as sponsors and customers; as well as engage in other activities such as sales and marketing, which may require high levels of social skills (Zhao et al.,2010). EXTRO influences commercial entrepreneurial intention (Zhao et al., 2010). However, in some studies it did not exert much influence on SE dimension (Nga and Shamuganathan, 2010) but there could be a strong reason for to choosing students as sample, not social entrepreneur. Thus in Indian context and for social entrepreneur we can postulate:

H2 (a), (b),(c),(d),(e) :Extroversion plays a significant role for all the dimensions of social entrepreneurship.

Conscientiousness

It may be defined as degree of discipline and control of an individual. Highly conscientious people are usually hard-working, dependable, zealous, enterprising and determined (Zhao, 2006).. CONSC also has significant positively relation with Sustainability and Financial return of SEs in Malaysia (Nga and Shamuganathan, 2010). Conversely, a study concludes that in cultures with tendency to prioritize monetary income and to avoid uncertainties, people with high level of CONSC would be less motivated to become SEs. (Irengun and

Arikboga, 2015). The conscientious people needs things to be done on time and accepts the same from others working with around. Therefore they are highly punctual, disciplined and perfectionist in their work. Thus, we can propose it:

H3 (a), (b),(c),(d),(e) : Conscientiousness has a significant influence on all the dimensions of social entrepreneurship.

Openness

Openness refers to the compassion to embrace new experiences, complex and innovative ideas as well as creativity (Zhao et al., 2010). People who tends to be highly outspoken are often less predictable, adaptable and broad minded. (Sahni et. al., 2018). This kind of persons are usually open for all challenges, risk taking, and zealous to make profits, it is in core of an entrepreneur personality.In social entrepreneurship there must be is social oriented process rather than profit oriented. Financial surplus should be reinvested in social businesses for resolving a social problem. In previous studies openness is significantly influenced by innovation, social vision and financial returns in Malaysia (Nga and Shamuganathan, 2010).Thus we can say that:

H4 (a), (b), (c),(d),(e) : Openness has a significant influence on all the dimensions of social entrepreneurship.

Neuroticism

The neuroticism may be defined by the people often feel anger, guilt, depression, fear and found in negative emotional state of mind. High degree of neuroticism may cause development of a dubious irrationality in their thoughts and behaviour. They tend to be impulsive, impatience and doubtable, sometimes incapable of handling conflicting situations (Denissen, 2008). Social entrepreneur must be less neurotic in coarse of their action to cope with situation and bear the pressure, as well as they should be tentative on creation of social network (Nga & Shamugna tham, 2010), so we can formulate as:

H5 (a),(b),(c),(d),(e) : Neuroticism has a significant influence on all the dimensions of social entrepreneurship.

Research Design and Methodology

For the study founders and owners of social enterprises are selected on the basis of availability and convenience. First of all list of social entrepreneurs has been prepared then contacted them telephonically. Afterwards online questionnaire is forwarded to 280 social entrepreneur through e-mail, with three times reminder. Only 150 responses received, among them 115 were qualified for the study.

The scale for social entrepreneurial dimensions (Social vision, Sustainability, Social network, Innovation and Financial returns) used in this study is taken from Nga and Shamugnatham (2010) as observed variable. Add on The Big 5 Personality traits (Openness, Extroversion, Agreeableness, Conscientiousness, and Neuroticism) by Schmitt et al. (2000) is adopted as measured variable. The 5-point Likert scale is employed for all the constructs.

Data Analysis

The data obtained from the questionnaire is employed for factor analysis and multiple linear regression. First of all reliability and validity of the social entrepreneurial constructs as a dependent variable has been tested (Table 1).The table 1 shows that the Chronbach's Alpha value for all constructs were within the range from 0.81 to 0.87 which is found acceptable (Hair et al., 2010), thus the data is reliable. Whereas result of Kaiser-Meyer-Olkin (KMO) test obtained 0.81 reveals efficiency of scale for factor analysis to test the validity of the constructs. The table 1 also shows that the Eigen value for all constructs is more than 1 means all the items of these constructs are statistically valid too.

Table 1 Reliability and validity test- dependent variable

	Dependent Construct				
	Social Vision (SV)	Social Network (SN)	Sustain ability (STB)	Financial Returns (FR)	Innovation (INNOV)
SV02- Are able to create a clear social vision	.819				
SV04- Take a focused stand on social issues	.754				
SV03- Are strongly committed to a social vision	.739				
SV06- Are determined to be agents of social change	.666				
SV08- Have a strong motivation to defend a social need	.623				
SV05- Are determined to meet social need	.614				
SN01- Enable access to a financial resources		-.809			
SN02- Enable access to human resources		-.721			
SN03- Enable access to a wider market		.654			
SN06- Promote credibility of the business		.682			
SN05- Promote trust in business		.637			
SN07- Provide a platform for mutually beneficial social efforts		.515			
SN04- Promote knowledge sharing		.532			

Contd...

STB03-	Improves a long term social need			.830		
STB07-	Promotes a balance between the social mission and social			.726		
STB08-	Promotes a balance of economic, social and environmental			.782		
STB01-	Are environmentally friendly			.717		
STB06-	Promotes solutions that are ethical			.677		
STB04-	Promotes stakeholder accountability			.544		
FR08-	Making profits a means to achieve a social goal				.822	
FR05-	Selling goods and services for a profit				.802	
FR01-	Maximizing the wealth of their investors				.771	
FR07-	Survival through profits				.745	
FR03-	Maximizing wealth				.526	
INNOV03-	They are able to create social value through goods/services					-.820
INNOV06-	They are pragmatic individual					-.850
INNOV02-	They are able to see risks as opportunities to create social					-.825
INNOV04-	They are able to deliver sustainable advantage through innovative goods/services					-.732
INNOV08-	They are innovative individual					-.653
Eigenvalue		7.05	2.36	2.91	3.68	1.54
Chronbach's Alpha		0.87	0.81	0.83	0.86	0.85
KMO Measure of Sampling Adequacy		0.81				

After employing the reliability and validity tests for dependent variables (social entrepreneurial dimensions) same has been employed for independent variables (big five personality traits) as seen in the table 2. According to table 2 the Chronbach's Alpha value for all independent constructs ranging from 0.61 to 0.79 which are also falling within the acceptable range (Hair et al., 2010). Where as to test the construct validity a separate Exploratory Factor Analysis (EFA) was also conducted for all the constructs followed by the Kaiser-Meyer-Olkin (KMO) test with obtained value 0.66. Table 2 shows that the Eigen value for all the construct is more than 1 confirming the validity of the constructs.

Further to test series of Hypothesis ranging from H_1 to H_5 Multiple Linear Regression analysis (LMR) has been applied at the 95% of confidence interval that means the hypothesis will be considered significant if the *p*-value is below 0.05 and will be rejected if *p*-value is more than 0.05.

Discussions and Findings

From the above table 3 we can say that the SV dimension has significant and positive impact on EXTRO supporting H2(a). The most effective SN dimension showing positive influence on AGREE, EXTRO and CONSCI supporting H1(b), H2(b) and H3(b) whereas it shows significant but negative impact on NEURO supporting H5(b). If we talk about STB dimension it is also showing significantly positive influence on EXTRO and OPEN supporting H2(c) and H4(c) as well as significantly negative impact on CONSCI supporting H3(c). FR dimension of SE has a significant positive impact on CONSCI supporting H3(d). The last but very important dimension of SE is INNOV showing significantly positive influence on AGREE, EXTRO and OPEN supporting H1(e), H2(e),and H4(e).Thus all the dimensions must influence by at least any one personality traits.

In a social enterprise extroversion can play an important role by affecting all the dimension because it is related to one's ambition, sociability and individuality (Ciavarella et al., 2004) like if an entrepreneur is extroverted he would be able to portray his social vision properly as well as convey it to larger extent by creating great social network. Extroverted individual get motivated for better and innovative practices for society. It also stimulates to engage more and more volunteers to sustain the activities of an enterprise. According to this the extroverted entrepreneur are poor in gaining financial return they focus more on social impact rather than profit. But they are good in sustainable practices.

Agreeableness has also positive impact on many dimension because it involves the degree of cooperativeness, consideration towards others and trust based relationships (Ciavarella et al., 2004, Zhao et al., 2010). Agreeableness is core to social network and it constitutes an important source of benefits to ensure the organization functioning and success (Pollack et. al.2016) it also facilitates connection of one to other.

Conscientiousness may be understood as an individual comply with rules or regulations and are meticulous at work (Llewelyn and Wilson, 2003). It has significant positive impact on SN and FR which show their industriousness part but in regard to SE they are showing significant but negative impact on STB, in past researches it is also concluded that they are profit makers and to avoid uncertainties people with high level of CONSCI cannot sustain a social business for a longer period (Irengun and Arikboga,2015).

Openness is considered as affinity to embrace new experiences, creativity and presenting innovative idea, to analyse and solve the problems (Zhao.et.al, 2010). In this study it has positive and significant influence on INNOV and STB .Thus the individuals of high level of openness are the innovators for solution of immediate social problems and are predecessors of sustainable development,

Table 2 Reliability and validity test- independent variable

	Independent Construct				
	Agreeableness (AGREE)	Extroversion (EXTRO)	Conscientiousness (CONSC)	Openness (OPEN)	Neuroticism (NEURO)
AGREE10- I believe in maintaining harmonious relationships with my peers	.774				
AGREE2- I take other people's circumstances and feelings into consideration before making a decision	.721				
AGREE06- I believe in the importance of achieving agreement with my peers before forming conclusion	.701				
EXTRO02- I like to win, even if the activity isn´t very		.854			
EXTRO04- I would like to attain the highest position in an organization some day		.732			
EXTRO07-I am always looking for opportunities to start a new project		.677			
EXTRO03-I prefer to set challenging goals ,rather than goals that I am likely to reach		.612			
CONSC08- My peers would say I am a dependable person			-.825		
CONSC09- My peers would say that I am a responsible person			-.811		
CONSC05- I am motivated to meet targets in jobs assigned to me			-.727		
OPEN02- I work well in an environment that allows me to create new things				.777	
OPEN04- I know what is expected of me in different social situations				.707	
OPEN07- I am able to connect what I know with new				.689	
OPEN09- My peers would say that I am an innovative person				.676	
OPEN03- I work best in environments that allows me to be creative				.605	
OPEN06- My peers would say that I am an open-minded person				.540	
NEURO07- I am easily irritated with things at work					-.901
NEURO06- I easily get stressed in my job					-.846
NEURO02- I am easily displeased with things at work					-.753
Eigenvalue	1.85	2.21	1.82	4.93	2.42
Chronbach's Alpha	0.65	0.61	0.71	0.73.	0.79
KMO Measure of Sampling Adequacy	0.66				

Table 3 Multiple linear regression (MLR) analysis

	Social Vision SV			Social Networks SN			Sustainability STB			Financial Returns FR			Innovation INNOV		
	Ref	b	Sig	Ref	b	Sig	Ref	b	Sig	Ref	b	Sig	Ref	b	Sig
(Constant)		10.349			12.321			7.876			3.271			8.932	
AGREE	$H_{1(a)}$	.065	.588	$H_{1(b)}$	.288	.028*	$H_{1(c)}$	.109	.175	$H_{1(d)}$	.298	.123	$H_{1(e)}$	.236	.020*
EXTRO	$H_{2(a)}$	.638	.001*	$H_{2(b)}$	.675	.008*	$H_{2(c)}$	.467	.001*	$H_{2(d)}$	.532	.853	$H_{2(e)}$	.386	.018*
CONSCI	$H_{3(a)}$	.134	.512	$H_{3(b)}$	.589	.006*	$H_{3(c)}$	-.268	.045*	$H_{3(d)}$	-.188	.050*	$H_{3(e)}$	.190	.258
OPEN	$H_{4(a)}$	.288	.072	$H_{4(b)}$	.312	.326	$H_{4(c)}$	.238	.027*	$H_{4(d)}$	-.058	.467	$H_{4(e)}$	.053	.048*
NEURO	$H_{5(a)}$	-.134	.579	$H_{5(b)}$	-.458	.058	$H_{5(c)}$	237	.052	$H_{5(d)}$	.302	.455	$H_{5(e)}$	-.077	.654
Adjusted R s - Square		0.234			0.213			0.262			0.134			0.131	

and also mobilizes the ideas, capacities, resources and social arrangements required for long term, sustainable, social transformation through social innovations.

Neuroticism is referred as emotional instability, mood swing, and lack of control over the facing situations (Llewelyn and Wilson, 2003). Social entrepreneurship is the process of grabbing opportunities in problems of the society to bring the change, for this kind of noble cause a person with high level of neuroticism will be insufficient for such situation. NEURO has no significant positive influence on any of social entrepreneurial dimensions except a significant negative influence on SN deals that if high the degree of NEURO less will be the social network.

Conclusion and Implication

The study reveals extroversion as the most impactful personality trait influencing all social entrepreneurial dimensions except financial returns. Agreeableness has significantly positive impact to innovation and social network as Conscientiousness has on financial return and social network but it shows significantly negative influence on sustainability. Subsequently Openness has significantly positive impact on sustainability and innovation whereas Neuroticism has significantly negative influence on social network. There are significant influence of personality traits on social entrepreneurship rather than other forms of entrepreneurship. The small sample size is a limitation for this study larger sample size can give better results. This study also suggest the guidelines for academicians and professional who give rise to new generation leaders with social mission and vision by inculcating personality traits and shaping their behaviour accordingly. Though personality has great impact on SE, but future studies may focus on other aspect and functional attributes of social entrepreneurship like factors involves in development of social entrepreneurship.

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Socio-Economic Impact of MGNREGA on Participating Households in Tonk District of Rajasthan

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Abstract: The present study attempts to analyze the working of existing MGNREGA scheme and assesses its impact on socio-economic conditions of participating households in Tonk district of Rajasthan. Tonk is one of those districts where MGNREGA was implemented in second phase (2007) and it was included in backward districts of India. In this study the four Gram Panchayats of two blocks of Tonk district have been covered. For conducting this research, a combination of descriptive, analytical and participatory research design has been adopted. The four stage-stratified-random sampling has been used to select the 160 respondents from MGNREGA participating households. The ANOVA has been applied to test the equality of mean incomes of participating households among the three categories and the Post-hoc analysis has been carried out to find the categories whose mean incomes are significantly different. The findings of the study show that economic category, MGNREGA income, agriculture & animal husbandry income and family size have significant impact on the consumption level in the selected research area during the reference period, however, the impact of social category has not been found statistically significant.

Key words: MGNREGA, Participating Household, Backward Regions Grant Fund Programme.

Introduction

The rising unemployment particularly in rural areas is one of the most challenging tasks for the policy makers and planners to tackle. Over the years this is worsening and assuming severe form. As per the NSSO study, around 30 crore people are living in severe poverty conditions because of non-availability of jobs. Uncertainty and irregularity of monsoon and seasonal work in the agriculture sector makes this more miserable in rural areas. A large number of workers make their living

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through unskilled and casual manual labour where there is no security of work and sufficient earning to meet the basic needs of the family. Therefore, to encounter the problems of unemployment, poverty and food security, on August 25, 2005 National Rural Employment Guarantee Act (NREGA) enacted by Government of India and which was later on renamed as Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).This Act was implemented by the Government to provide 100 days of employment in each financial year to the members of any rural household whose member is willing to do unskilled manual work. This programme aims to provide means of livelihood and food security for eradicating the rural poverty and creation of sustainable assets. The main objective of the Act is "to provide for the enhancement of livelihood security of the households in rural areas by providing at least 100 days of guaranteed wage employment in every financial year to every household whose adult members volunteer to do unskilled manual work".

The majority of population (about three-quarters of population) in Rajasthan is living in rural areas. There is huge variation in the physical, climatic and social aspects of the state making it very hard to provide employment opportunities in deserted, semi-deserted and droughts ridden areas. Therefore, the role of MGNREGA scheme in Rajasthan becomes very crucial in providing employment, livelihood and food security for the people of the state.

Rajasthan is among those selected states where MGNREGA scheme was firstly launched in 2006. It got implemented in Tonk district in its second phase in 2007. In 2006 Ministry of Panchayait Raj classified Tonk as one of the country's backward districts in the country. Tonk is also receiving funds from Backward Regions Grant Fund Programme (BRGF). The Ministry of Rural Development is implementing many schemes and programme to provide employment to marginalized and disadvantaged sections of the society including Scheduled Castes and Scheduled Tribes. The Ministry has also made some special provisions in guidelines of the programmes to ensure adequate flow of resources to these sections. The present study evaluates the MGNREGA scheme by categorizing the participating household in SC, ST and other categories.

Table 1 presents the current status of MGNREGA in Rajasthan during financial year 2018-19. A glance at this table shows that total number of job card is more than 101 lakhs and total number of workers participating in this scheme is 247 lakhs. The percentage of SC and ST workers against the active worker is 20.11% and 22.32% respectively. The Table 1 shows the comparative situation of MGNREGA in Rajasthan in financial year 2017-18 and 2018-19. It is obvious from the table there has been an improvement in most of the parameters in 2018-19 over the previous year.

Table 1: Current status of MGNREGA in Rajasthan in financial year 2018-19

Particulars	
Total number of districts	33
Total number of Blocks	295
Total number of Job card issued (in lakhs)	101.27
Total number of workers (in lakhs)	247.45
Total number of Active Job cards (in lakhs)	67.66
Total number of Active workers (in lakhs)	127.53
Percentage of SC workers against active workers (in %)	20.11
Percentage of ST workers against active workers (in %)	22.32

Source: www.nrega.nic.in

Table 2: Performance of MGNREGA in Rajasthan

Particulars	2017-18 (in lacs)	2018-19 (in lacs)
Total Job card issued	97.50	101.27
Total Job card issued to SCs	18.20	19.62
Total Job card issued to STs	18.09	19.02
Total Job card issued to (non SC/ST)	61.22	62.62
Total Household allotted worked	45.14	51.64
Total Person allotted work	65.31	75.37
Total SC Household worked	9.36	10.95
Total Person days worked by SCs	505.50	629.40
Total ST Household worked	9.8	11.41
Total Person days worked by STs	515.26	656.82
Total Person days worked	2397.75	2942.45

Source: www.nrega.nic.in

Table 3: Performance of MGNREGA in Tonk

Particulars	2014-15 (in '000)	2015-16 (in '000)	2016-17 (in '000)	2017-18 (in'000)	2018-19 (in'000)
Total Household applied for Job card	263.62	266.20	226.10	263.90	273.28
Total Job card issued	263.40	265.75	264.90	260.26	269.10
Total Job card issued to SCs	51.62	52.13	52.19	50.47	53.66
Total Job card issued to STs	38.27	39.07	39.55	39.00	40.63

Contd...

Total Job card issued to (non SC/ST) 174.76		173.50	174.50	173.10	170.77
Total Household demanded work	91.68	136.54	150.67	134.80	158.33
Total Household allotted work	91.66	136.50	150.55	133.95	158.13
Total Person demanded work	127.20	220.71	254.11	227.76	266.37
Total Person allotted work	127.16	220.55	253.86	225.88	265.80
Total SC Household worked	24.30	33.90	34.14	32.30	36.53
Total Person days worked SCs	46.61	124.70	123.24	109.70	117.81
Total ST Household worked	23.20	27.10	27.40	25.16	28.40
Total Person days worked STs	41.10	97.04	96.55	78.52	80.25
Total Person days	2342.33	5788.97	6309.10	5232.40	5417.67

Source: www.nrega.nic.in

Review of Literature

Many individual researchers, institutes and task force have conducted the studies on the various aspects of MGNREGA scheme like generation of employment, creation of assets, and change in living standard of the beneficiaries etc. There have been wide inter-state as well as inter-district variations in the achievements of the objectives of the act. In spite of many empirical studies examining the impact of the MGNREGA, there are few study at the district level particularly in Rajasthan. To fill this gap the present study attempts to find the impact of this scheme on marginalized and disadvantaged sections of the society, particularly scheduled castes and scheduled tribes in Tonk district of Rajasthan in terms of changes in income, savings and consumption level.

Engler and Ravi (2012) examined the performance of MGNREGA in Andhra Pradesh. They found that there had been a significant increase in per capital consumption expenditure of participating households. Around 23% of increase in expenditure on non-food items was registered. There has been improvement in standard of living and working conditions of the beneficiary households. The research also analyzed the expenditure of households on education of children, health and social ceremonies. The health outcomes have also shown some positive changes. Garg and Yadav (2010) selecting five blocks of Rewari District in their study attempted to find why the participating household joined this programme. 44% of the beneficiaries in Jatusana block revealed that they joined the MGNREGA to get the means to satisfy their basic needs and remaining respondents told that they joined because of large size family and lack of fertile land holdings for cultivation. A major number of respondents from Bawal block also revealed the same reason that fulfillment of basic needs and lack of fertile land holding are the main factors for joining MGNREGA. Subhashish (2009) investigated the case

of Birbhum District of West Bengal state. His study indicates that the major participation in scheme has been from the BPL households and their economic condition has improved significantly. Improvement in economic conditions led to their socio-political participation in routine functions of the Gram Panchayat. Social activist Roy (2009, quoted in UNDP 2009) "NREGA exemplifies the features of a mature democracy, which provides- the poor with the right to demand, the right to know and the right to dignity. Not the right to beg".

Objectives of Study

The major objective of the study is to find the impact of MGNREGA on living standard and livelihood in terms of income and consumption expenditure of rural labors/workers. For this the following specific objectives have been identified:

- to assess the impact of MGNREGA on income level of participating households.
- to assess the extent to which MGNREGA affected the savings, the consumption expenditure and livelihood security to different categories of participating households.
- to suggest strategies for effective implementation of MGNREGA in Rajasthan state.

Hypotheses

- H_0: There is no significant impact of MGNREGA on income of the participating households.
- H_0: There is no significant impact of MGNREGA on savings, expenditure on health and education of the participating households.

Research Methodology

The study adopted four stage-stratified-random sampling to select the household from the MGNREGA beneficiaries. Firstly two blocks namely, Deoli and Uniara were randomly selected from six blocks (Uniara, Todarsingh, Malpura, Tonk, Deoli, Newai) in Tonk district. Then the two Gram Panchayats (GPs) were selected from each block. In the third stage two villages were selected from the each Gram Panchayats (GPs). In the fourth stage participating households were selected. In this stage, 20 households were randomly selected from each village. The list of cardholders for each Grama Panchayat and village was obtained from the MGNREGA website. All households from the list were stratified according to their social category i.e. SC, ST and Others. On MGNREGA website the data for OBC cardholders is not separately shown. It has been merged in the "Others

category". The total number of households selected through this process is 160. From each village a sample of 20 participating households has been divided into three social category in such a way that 5 from the SC and ST category each and 10 households from the others category.

The household survey schedule compiled the information from the MGNREGA participating household on their various aspects such as the socio-economic background of the household like age, education, demographic features, employment, land holding, housing status, expenditure on food & non-food items, education, health, consumer durables and so on. The survey questionnaire was finalized after the pilot study.

Table 4 Category and Gram Panchayats-wise (GPs) distribution of selected households

Block	No. of Panchayats	No. of Villages	SC	ST	Others	Total
Deoli	2	4	20	20	40	80
Uniara	2	4	20	20	40	80
Total	4	8	40	40	80	160

Before analyzing the collected data and information from respondents, these have been cross-checked through Focus group discussion (FGD) approach. Mean standard deviation and range have been used for descriptive statistics. The ANOVA has been applied to equality of mean income of MGNREGA participating households in three categories. The Post hoc analysis has been performed to find the categories whose mean incomes are significantly different.

The present study is mainly based on primary data collected from the field (Gram Panchayats) through survey. The base year/reference period for performance assessment is 2018-19. However, secondary data have also been used. Semi structured questionnaire has been used for collecting primary data. The secondary data was collected from the website www.nrega.nic.in and www.nrega.raj.gov.in.

Data Analysis and Findings

To assess the impact of this flagship programme on the marginalized and under-privileged sections of the society, the beneficiary households of the selected district has been categorized in SC, ST and others category. The socio-economic profile of these participating households reflects how they are struggling to meet their basic needs. Most of them are either landless or marginal farmers. The earnings from agriculture labour or cultivations is very meager. After fulfilling their food and clothing needs, they are not able to spend on the education and health. One of the reasons responsible for this is that the needs of local people

have not been addressed in mega schemes of centre and state governments. Despite the many mega schemes, the decentralization the panchayats has been neglected. MGNREGA is the first flagship programme which assigns a significant role to PRIs to focus on development needs of local people by providing the employment and food security.

Economic impact of MGNREGA on Household Income and Savings

The table 7 indicates the income and category-wise distribution of participating households in MGNREGA scheme. A glance at the table 7 shows that the 5% of households in SC category earns less than Rs.5000 per annum from the MGNREGA work. It is also revealed that more than half of the household in SC category gets the income of less than Rs. 20000 per annum from MGNREGA works. Only 9% of the beneficiaries are earning more than 25000 per annum in SC category while for others' category it is 14%. In ST category, percentage of households earning between Rs. 10000 to 20000 is more than 40%. It clearly reflects the variations in distribution of income from MGNREGA. There is no denying fact that additional income from MGNREGA has contributed significantly in upliftment of marginalized sections but still there is a greater possibility of improvement.

When the beneficiaries are asked to tell about the change in income level and savings, they hesitate in revealing the actual figure. They generally underestimate their income and savings. Some of the respondents participating in this scheme did not answer this question making the quantitative analysis difficult.

Table 5: Category-wise distribution of MGNREGA income

Income (Rs.)	Number of household annual income from MGNREGA		
	SC	ST	Others
Less than 5000	2 (5)	3 (7.5)	5 (6.25)
5000- 10000	8 (20)	7 (17.5)	20 (25)
10000-15000	6 (15)	8 (20)	13 (16.25)
15000-20000	5 (13)	9 (22.5)	15 (18.75)
20000-25000	10 (25)	6 (15)	13 (16.25)
More than 25000)	9 (22)	7 (17.5)	14 (17.50)
Total	40 (100)	40(100)	80(100)

Source: Field Survey 2018-19 *Note: Figures within parenthesis denotes percentages

Table 6: Mean and Std. Dev. of Income generating from MGNREGA

Category		*Mean*		*Std.dev.*
SC		17698.8		3221.36
ST		15841.7		2667.58
Others		14140.0		1749.91
ANOVA				
Source	SS	MS	F- stat.	p-value
Treatment	57028291.19	8514145.59	4.16	.0281*
Error	164442521.56	6851771.731		
Total	221470812.74			

· Significant at 5% level of significance

Table 7: Post Hoc analysis

p-values for pair wise t-tests		Others	ST	SC
		14140.0	15841.7	17698.8
Others	14140.0	0.1806		
ST	15841.7	0.0082	0.1454	
SC	17698.8			

In many cases, although the number of days worked in MGNREGA have increased but due to delay in payment, the worker did not perceive the feeling of increased income. The results of the ANOVA test show the significant difference in mean incomes of households. But the main limitation of this test is that it does not tell which pair of is significantly different. To know this the post hoc analysis has been made in table 9 which indicates that difference between SC and Others category is statistically significant. The other category includes the OBC and general castes. Because of diversity in work culture, productivity, food habits,

Table 8: Source-wise distribution of average annual income of the participating households

Category	Source of Income				(Rs.)
	Agricultural and Live stocks	Agricultural Labour	Non-Agriculture	MGNREGA	Total
SC	13245(13.06)	50500(49.78)	20000(19.72)	17700(17.45)	101445(100.00)
ST	11276(12.91)	42700(48.13)	18900(21.30)	15842(17.86)	88718(100.00)
Others	9800	45000	16500	14140	85440
	(11.47)	(52.67)	(19.31)	(16.55)	(100.00)

Source: Computed from primary data. Note: Figures within parentheses denotes percentages.

consumption pattern and tradition and other factors there is greater amount of variation in income and consumption level. It is quite discernible from the socio-economic profile of the households.

Table 8 presents the source-wise distribution of annual income of the MGNREGA participating households. Among the landless or marginal farmers the agriculture labour is the biggest source of their income. Under this source the household of all three categories are earning around 50% of their total income.

Table 10 shows the percentage of household saving from MGNREGA income. This table clearly reflects that the amount of savings is positively related to number of days worked in MGNREGA.

Table 9: Descriptive statistics

	SC	ST	Others
Standard Deviation	37071.51073	32143.40463	31832.48467
Sample Variance	1374296908	1033198461	1013307080
Kurtosis	1.759786729	2.070014852	1.169261149
Skewness	1.516010456	1.566622621	1.394308852
Range	88200	77442	75640
Minimum	13245	11276	9800
Maximum	101445	88718	85440

Table 10: Percentage of household who saved from MGNREGA income

Days worked	SC	ST	Others	Total
0-25	6.11	5.68	13.71	9.13
26-50	17.45	18.97	23.14	18.84
51-75	15.75	21.84	19.67	17.35
76-99	18.13	23.65	14.56	19.17
100	20.58	25.62	12.90	20.22
More than 100	46.89	35.56	28.34	33.23

Source: Computed from primary data

Only 18% of the household could save, under the category of working less than 50 days. The households working more than 100 days in MGNREGA could save in larger proportion (around 47%). The number of household saving in higher percentage could be seen ST category. The changes in savings of the households working less than 50 days, is insignificant. Therefore in order to raise the savings of the marginalized people, the number of working days in MGNREGA should be increased.

One fact is clear from the table 13 that, who worked for more number of days, could save higher amount. The maximum households' saving was made from those who worked more than 50 days. There has been lesser increase in savings of those households who worker less than 25 days in financial year. This trend can be observed in all three categories for 25 days group.

Table 11: Gram Panchayat wise mode of average annual savings of the households

Gram Panchayat	No. of Household	% of the savings members to the total households	Mode of saving (%)			
			Bank	Chit Funds	Post Office	Friends
Polyada	34	21.25	62	19	11	8
Deoli	36	22.50	70	5	12	13
Kakod	24	15.00	66	22	8	4
Uniyara	26	16.25	76	11	4	9
All Beneficiaries	120	75				

Source: Field Survey 2010-11

The workers who worked more than 50 days and have other source of income, the MGNREGA helped in improving the living standard and livelihood security. Another interesting point revealed by the respondents is that if they get their wages in lump sum, it helps them to save more. When they are paid on daily wage basis, that money is generally used in fulfilling the day-to-day needs. However, due to delay in wage payment, they are forced to borrow from friends and other sources. They have to depend on loan for meeting their day to day needs. When they get their payment, by that time the loan amount becomes larger and the major portion of their income goes in repayment. Some of the households wanted their wage payment timely so that they can plan their expenditure and savings accordingly. Table 11 presents the Gram Panchayat-wise mode of average annual savings of the households. Bank is the most preferred mode of saving in all four Gram Panchayat. They think that it is easy and convenient to withdraw money from banks in case of need. More than 62% of savings have been deposited in the banks. The Uniyara Panchayat has contributed the highest amount in the bank's savings and Polyada lowest among the selected Gram Panchayats.

Impact on Consumption Level and Living Standard

More than 70% of households reported an increase in their consumption level because of MGNREG income. It indicates that there has been improvement in living standard and living conditions of the participating households. A cursory look at the table 14 shows that additional income coming from the work in

MGNREGA has been spent on food, domestic consumption items, health, and clothing. It is quite common that whenever the individuals get the additional income, it is utilized in meeting the consumption requirements, buying of consumer durables like fridge, furniture, TV, vehicle, etc. It improves the living conditions and standard of people. A part of supplementary income also goes into children's education (books, uniform, tuition fees, conveyance etc.) and health expenses. The highest proportion of supplementary income from MGNREGA has been spent on food and domestic durables. There has been a positive significant improvement that more than 20% this additional income has gone into children's education and health. This expenditure is investment in human resources which increases the efficiency and productivity in the economy in the long run and helpful in combating the poverty. Many households reported that they were not able to spend sufficient amount on education and health before MGNREGA. Now after implementation of this mega scheme, they are getting regular income which enables not only to meet day-to-day domestic expenses but also some small assets creation has also become possible. All these show the importance of MGNREGA programme in improving the living standard and conditions of the participating households.

Table 12: Use of Supplementary income from MGNREGA (in percentage)

Items	SC	ST	Others	Total
Food	10.13	9.46	12.53	11.09
Domestic durables	12.17	13.69	14.88	13.45
Clothing	7.45	8.89	9.86	8.18
Housing	9.56	9.14	10.29	9.75
Education of children	10.43	12.50	13.33	12.30
Health	9.59	8.13	9.56	9.25
Agriculture	12.42	11.35	8.95	10.95
Animal Husbandry	7.45	8.34	6.12	6.91

Source: Field Survey 2010-11

Table 13: Percentage of households whose consumption increased from MGNREGA income

Gram Panchayat	SC	ST	Others	Total
Polyada	75.53	64.55	85.71	72.44
Deoli	72.72	72.97	70.21	73.46
Kakod	56.12	61.01	65.43	59.17
Uniyara	76.47	57.97	59.18	65.36

Source: Field Survey 2010-11

The figure 2 demonstrates the distribution of supplementary income on different items and table 15 indicates Gram Panchayat-wise the percentage of households whose consumption increased because of MGNREGA income.

The following regression model has been used to find the factors affecting the consumption expenditure of MGNREGA participating household

$$Y = \alpha + \beta_1 D_1 + \beta_2 D_2 + \beta_3 X_1 + \beta_4 X_2 + \beta_5 X_6 + \varepsilon_i$$

Where, Y = Average consumption expenditure (Rs.) per person of MGNREGA participating households

α = Intercept. X_1 = Income for MGNREGA work (in Rs.)

X_2 = Income from agriculture and animal husbandry (in Rs.)

X_3 = Family size (in number of persons)

D_1 = Economic category (1 for APL, 0 for BPL)

D_2 = Social category (1 for others, 0 for SC/ST). β_i = Slope coefficients.

Table 14: Regression results

Multiple R		0.97		
R Square		0.95		
Adjusted R Square		0.94		
Standard Error		1559.82		
F-stat.	65.55926			
(P-value)	(0.00)			
Variable	Coefficients	Standard Error	t- Stat.	P-Value
Intercept	2150.94	3596.12	0.59813	0.55
Economic category	6512.6	1712.04	3.804032	0.001**
Social category	1585.863	736.02	2.154645	0.069
MGNREGA income	1.01	0.3567	2.855754	0.012**
Agriculture and animal husbandry income	0.12	0.0693	1.746334	0.052*
Family size	-871.91	325.20	-2.68114	0.017**

*Significant at 5% level of significance ** Significant at 1% level of significance

Table 15: Correlation matrix

Consum. Exp.	*1.0*					
MGNREGA	*.910*	*1.0*				
income		*.767*	*.894*	*1.0*		
saving	*.876*	*.900*	*.802*	*1.0*		
Days worked	*.386*	*.683*	*-.344*	*.911*	*1.0*	
Edu.Exp.	*-.115*	*.785*	*-.164*	*.715*	*.166*	*1.0*
Health Exp.						

Table 14 presents the results of regression analysis which has been used to find the impact of MGNREGA income and factors on the consumption expenditure of the participating households. The value of t-stat. is significant for all independent variables except social category. This implies that economic category, MGNREGA income, agriculture & animal husbandry income and family size have significant impact on the consumption level. The impact of social category has not been found statistically significant. The F test measures the overall significance of the model. From the table 16, it can be seen that the value of F-stat. is 65.55 which is statistically significant at 1% level of significance. The coefficient of R-Square is 0.95 which is quite high. The table 15 presents the correlation matrix. It indicates the degree to which the variable consumption expenditure, MGNREGA income, savings, days worked in MGNREGA, expenditure on education and health are correlated to each other.

Conclusion and Suggestions

The present study analyzed the status of person days generated, consumption level, savings and standard of living of MGNREGA participating households in Tonk district. The study finds that additional income generated from the MGNREGA work has been spent on food, domestic consumption items, health, and clothing. The study concludes that in the selected research area (Polyada, Deoli, Kakod and Uniyara of Tonk district) there has been improvement in the savings, consumption level and standard of living because of implementation of MGNREGA scheme. Another interesting point revealed by the respondents is that if they get their wages in lump sum, it helps them to save more. If they are paid on a daily wage basis, that money is mostly used in meeting the day-to-day needs. The MGNREGA has been found more effective in improving the living conditions and livelihood security of marginalized sections of the society, where workers worked more than 50 days in a financial year and they are having some other source of income, such as income from agriculture and livestock etc. There is no denying fact that additional income from MGNREGA has contributed significantly in uplift of marginalized sections but still there is a scope of further improvement. It can be said that if executed properly with accountability and obligation to the laws, MGNREGA can efficiently contribute towards the inclusive economic growth of the country.

There should be revision of wages considering the inflation trend in the economy otherwise labourer feel tempted toward urban areas in the search of remunerative jobs. It has been observed that female workers face many problems at the work site because of non-availability of drinking water, crèche, and other facilities. The efforts should be made to improve the working conditions of the female labourers. The workers, who are either landless or marginal land holders, find it very difficult to meet the basic needs of their families in the absence of MGNREGA

work for the entire financial year. The efforts should be made at the Panchayat level to provide the work upto 100 days or more. This will reduce the tendency of labourer to migrate in the search of employment. While planning the activities of development for the block level, the assistance and feedback from the officials working at the block and Panchayat level should be given priority, because their involvement in planning will encourage them for better implementation of MGNREGA scheme. The technical or engineering staff at the Panchayat and block level should be trained and strengthened for monitoring, proper record maintenance and technical guidance works carried out in the villages. Some mechanism should also be devised to know the problems, suggestions and feedback of the MGNREGA workers so that appropriate policy changes can be made in the scheme and loopholes can be plugged for the betterment.

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Effectiveness of Training: A Comparative Analysis of Public and Private Sector Banks in India

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Abstract: The inadequacy and poor execution of the training evaluation and appraisal system is posing a barrier to training effectiveness. The lack of awareness about the tools and methods for the training assessment and evaluation process is another possible reason for inadequate evaluations. However, the process of assessment and evaluation needs to be emphasized to maximise its benefits. With this background, the present study is based on the objective to evaluate and compare the effectiveness of training and development initiatives of the private and public sector banks, by using Sutton's Five Stage Model and Kirkpatrick's Four-Level Model. Present study had included 400 sample employees selected through multi-staged stratified random sampling to make a comparative analysis by adopting the Sutton's Five-stage Effectiveness Evaluation Model. Finally, the analysis shows that there is no significant variation in the training effectiveness and outcomes of the private sector and public sector banks.

Key words: Banks; Training and development; Sutton's Model; Need Assessment; Design; Development; Implementation; Post-Program Evaluation

Introduction

Many research endeavours on the effectiveness and development of banking organisations, in the contemporary volatile and complex market situation, has highlighted the vital role that the training and development plays in making the organisations more effective and the work-force more educated for successfully carrying out their duties and responsibilities (Bush, 2006; Lingard et.al, 2002; Murphy and Hallinger, 1992). Due to a rapid change in the economic scenario of the country, today's banking work-force are tasked with ever-increasing responsibilities and multifaceted roles- ranging from communication with clients, staff and governmental officials, functional management and communication,

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administrative and financial duties, crisis and conflict management, monitoring and professional development opportunities and evaluations (Grobleret.al, 2012; Naidooet.al., 2019).

Consequently, all the banks organise various training programmes to tackle the changing situations and environment that help the work-force to perform their tasks and responsibilities effectively. The final stage of training is to evaluate the training process, which plays a critical role in measuring the outcomes of the training process. Many organisations in the Indian Banking Sector have commonly either marginalised or ignored this aspect of HR management (Giangrecoet.al., 2009; Allen, 2006). Although the evaluation process of training programs undertaken plays a vital role in measuring the outcomes, it is a source of frustration for organisations, who struggled to make the sense of the approaches,various requirements of the organisation and the work-force, and necessary evidence to conduct the training and development programs. The inadequacy and poorly execution of the training evaluation and appraisal system is posing a barrier to training effectiveness. (Saad and Mat, 2013). The lack of awareness about the tools and methods for the training assessment and evaluation process is another possible reason for inadequate evaluations (Eseryel, 2002); however, the process of assessment and evaluation needs to be overly emphasized to maximise its benefits (Duignan, 2001; Brown, 2007).

Background of the Study

In a progressive and sustainable organisation, the Human Resource Management and Development is the major pivotal constituent of creation and controlling of different rudiments of success and succession. Envisioned organizations with conspicuous structures and preeminent workplaces without appositely skilled manpower backed up with a motivated training and development initiative; certainly, crumple (Jabari, 2011; Dessler, 2010).

The Indian Banking Sector (IBS) has now entered into a phase of post-movement market power in a complex domain of market requiring a renewed look at the organization structure at the zenith with respect to the key factors of success and growth among the manpower in all-around and various levels with respect to the vision, skills, performances, significant, and targets (Bhattacharyya et.al., 1997). It has become a genuine necessity in the wake of advancing the dynamism through merging the Public as well as Private Sector Banks with high degree of FDIs to a higher levelled organisation with the involvement of highly-staked properties and interest, the importance of training and development to empower the human resources become pertinent and increasingly significant. The blend of customer-centric business with the robust employee-friendly human resource policies will help in real cognizance and measuring of success quantitatively as

well as synchronising the human emotions and distinctive self-goals (Agarwal, 2012; Srivastava and Agarwal, 2014).

New challenges arise incessantly in the field of training and development in banking sector due to presence of the challenges with respect to the competency development, skill and knowledge alignment, outsourcing, globalised functionaries, e-learning, knowledge management etc. So also, the process, strategies and the methods of training and development programs also experienced a substantiative change to meet up the demands of market, in the domains of customer needs and requirements, functional skill-gap, subject content of the training, selection of the participants and their requirement, schedule of the programs, instructors and trainers, effective training aids, feedback and evaluation, and above all the transformation of knowledge to practices (Kirkpatrick and Kirkpatrick, 2006; Bhide, 2001;Sengupta and Thomas, 2005; Singh and Kohli, 2006; Bank Net India, 2008; Prasad and Ghosh, 2007).

ModelsUsed for Evaluation of Effectiveness of T and D Initiatives in the Indian Banks

Contemporary banking organisations are increasingly committed a significant level of capital investment in their learning programmes, especially the training and development (T and D) programs, and are naturally keen to be derive and demonstrate the quantitative benefits of those investments. The most topical trend in evaluation of the learning initiations and policies are the models with simple financial justification techniques such as ROI (Return on Investment) calculations with a contention of too naïve, simple and accommodative to accentuate cost avoidance rather than increased human capital. Within the parameters cited by the literatures, the organisations have adopted two types of evaluation process, viz., formative and summative. The former includes a mechanism for feedback which is a part of the learning process, and the other is concerned with assessing with a predetermined standard (Wilson, 2004). Four types of evaluation as followed below have been under the overall Human Performance Technology (HPT) model (Van Tiem, Moseley et al. 2004):

a. Formative evaluation (a diagnostic process to provide the information necessary to drive improvement through Performance analysis, Cause analysis and Selection / design of improvement interventions)
b. Summative evaluation (determining the effectiveness of an intervention after its implementation i.e., immediate reaction and immediate competence)
c. Confirmative evaluation (identify and explain long term effects and centred around continuing competence or learning transfer, continuing effectiveness or organisational impact and Return on Investment)

d. Meta Evaluation / Validation (quality of the evaluation process and its relevance to the products)

The Evaluation Approaches and models that are commonly in usage in corporate environments to judge the effectiveness of the learning systems are:

a. The Kirkpatrick Approach: Based on Level 1 – Reaction; Level 2 – Learning; Level 3 – Behaviour and Level 4 – Results;
b. The Hamblin Approach: Based on Level 1 – Reaction; Level 2 – Learning Behaviour; Level 3 – Job Behaviour; Level 4 – Functioning; and Level 5 – Ultimate value;
c. The CIRO Approach: Based on C – Context evaluation; I – Input evaluation; R – Reaction evaluation; O – Outcome evaluation
d. The CIPP Approach: C - Context evaluation; I - Input evaluation; P - Process evaluation; and P - Product evaluation
e. Jack Phillips ROI Model: ROI = (Net Training Benefit/ Training Cost) X 100
f. Spitzer's Learning Effectiveness Measurement (LEM) Model.

The majority of the banks, in both private and public sector, in India are using the Kirkpatrick Model for Evaluation to analyse the effectiveness of the training and development initiation in their respective organisations. The approach is a four-stage model including the following:

Stage 1: Reaction: Evaluates how individuals react to the training model by askingquestions that establishes the trainees' thoughts.

Stage 2: Learning: Evaluating to gauge the level participants have developed in expertise, knowledge, or mindset.

Stage 3: Transfer: Evaluating the differences in the participant's behaviour at work after completing the program.

Stage 4: Results: Evaluating overall success of the training model by measuring factors like improved quality of performances, less mistakes in the workplace, more efficient production times, and a higher quantity of inter-personal relation etc.

By using the Kirkpatrick Approach or model for evaluation, it is found from various research endeavour that the private sector banks are found to be more effective in their T and D endeavour than the public sector banks (Kandpal, 2019; Batool and Batool, 2012; Bhatt and Mehta, 2013; Bhushan, 2018; Chaudhary, 2014; Chinnadurai, 2014; Faridi and Baloch,2018; Goswami et.al., 2017; Kaur, 2018; Narasimhan and Ramanarayanan, 2014). The same has been evidenced

clearly in the performance of the banks with respect to the productivity and the customer-orientation.

The Kirkpatrick's four-level model is an incomplete model as it ignores the pre-training activities, the first step occurs only after the completion of the training program based on the designs by trainers, for trainers' uses training language and not fully business focused. Finally, the model is not outcome oriented but concentrates almost exclusively upon training process measures (Bushnell, 1998; Garavaglia, 1998; Islam, 2004; Pulley, 1998). The Kirkpatrick Four-Factor method have some way or other have limitations which defy the "4Ps", i.e., Propose, Prospective, Process and Payback, to define the boundaries of any study of evaluation (Aryadoust, 2017; Embi et.al., 2017; Paul et.al., 2016). To break this incestuous and ultimately incapacitating the limitations is to recognise the five-stage evaluation life cycle i.e., the Sutton Five Stage Model, as being the synthesis of the research findings, best practice emerging from the literature and industry opinion. It includes:

1. Stage 1: determine decision-makers information needs.
2. Stage 2: Set programme goals
3. Stage 3: Design and pilot the evaluation regime
4. Stage 4: Monitor and Control the Programme
5. Stage 5: Demonstrate and share information about accrued value

Evaluation programs of the T and D initiations should be the eyes and ears of the programs which provides the sensory data that allows the management to effectively steer the policy initiations to achieve the desired organisational and HR goals (Sutton, 2005). So, the Sutton Five Stages/Factors Model that adopts a holistic approach to the valuation of learning programs deployed by the contemporary banking organisations, may be an alternative to the existing practices. The Sutton's Five-stage Evaluation Model for analysing the effectiveness of the T and D policies and practices includes the following dimensions presented in the Table-1:

Research Gap

The banks are adopting the Kirkpatrick's four-level model which includes major limitations as described. The general strength of the Kirkpatrick model in the theory and practice of evaluation has been acclaimed by the scholars. The model is recognised for its ability to provide a simple system on how to deal with different outcomes about the type of training, and how to get descriptive or evaluative information about those outcomes for signifying the results from a business perspective. This is a practical approach to handle the complex training-

evaluation process (Bates, 2004). With these strengths, it is undeniable that the Kirkpatrick model has made a significant contribution to evaluation theory and practice.However, the model does not effective when it has been used to a higher educational evaluationin the multifarious environments. The major limitation of this model is centred around the pre-training initiations (Haupt and Blignaut, 2007, Lambert, 2011, Covington, 2012; Steele et al., 2016). Thus, a research gap exists as majority of the studies ignore these limitations as well as ignoring other models like the Sutton's Five Stage Model which covers the pre- and post-training initiatives.

Table 1: Factors under the Sutton's Five-stage effectiveness evaluation model

Instructional Design Model (ISDM)	Evaluation life cycle	Focus for evaluation systems
Need Assessment	Initiation – Identify Information Needs	1. What are we trying to do? 2. Is this linked to broader business strategy? If so how? 3. Who are the decision makers? 4. What information do they need and in what form? 5. What will they do with the information and when will they need it?
Design	Set programme goals and actions	1. What are the overall business goals related to this initiative? a. Is it linked to fundamental organisational change? b. Is it designed to roll-out best practice? 2. What does the desired end state look and feel like- a. How will you recognise you are there? 3. At what stage is it reasonable to expect to see the effects of the change? a. Construct a time phased benefits realisation plan 4. What else would give the decision makers comfort that progress is being made?
Development	Design and pilot the Evaluation Regime	1. What information do Training Managers need to manage the conduct of the training programme? 2. What information do business and line managers need to ensure that the goals of the programme are met? 3. What information do operational managers need about the impact of the working environment on the adoption of new practice? 4. How can we encourage action planning to drive new behaviours?

Contd...

Implementation	Monitor and Control the Programme	1. Look for changes in knowledge a. Increased collaboration b. Increased take up of accreditations 2. Look for changes in behaviour a. Collaboration and networking b. Attitudinal changes c. Broader perspective d. Increased circle of influence 3. Look for changes in the environment a. Line manager changing behaviour b. Line manager removing barriers to change c. Change reaching beyond target community
Post-Program Evaluation	Demonstrate and share information on accrued value	1. Look for changes in Practice a. Sharing ideas and techniques b. Common vocabulary and approach c. Attempts to apply techniques d. Sense of professionalism/value/self-worth 2. Look for changes in traditional measures of business performance

Source: Sutton, B (2005); Sutton and Stephenson, 2005

Objective

The objective of the study is to evaluate and compare the effectiveness of training and development initiatives of the private and public sector banks, undertaken through various models of evaluation.

Research Hypothesis

H_0: There is no significant variation in the training effectiveness and outcomes of the Private and Public Sector Banks

Methodology Adopted

The researcher has attempted to measure effectiveness through five dimensions of the training initiatives by both PSBs and PvSBs, working in India. The research is descriptive as well as analytical in nature and based on empirical study.The present research has selected two banks, one each from private and public sector banks. The one largest bank from both the private and public sector have been chosen in the form of HDFC Bank and State Bank of India (SBI). The study was based on the data collected from primary sources, undertaken through a pilot-tested interviews from the sample respondents from the two banks, SBI and HDFC Bank, who were sampled out from the universe basing on the size of its operation as well as asset bases.

The present study has included 400 sample employees selected through multi-staged stratified random sampling from the organisations under study, SBI and HDFC Bank. For the current study, the total number of employees (SBI 245,642 + HDFC Bank 1,20,093 = 3,65,735) as on 30.06.2020 in the two study-organisations constituted the universe of the study. The assumption to define the universe is that any employees who have undergone at least one post-induction training program. As the data of segregation of types of employees are not available with two banks, it is assumed that all the bank employees have undertaken the induction and in service training. Thus, only the employees from officers/ executives and clerical cadres have been chosen randomly for the study. By using the Cochran's formula, the calculated sample size is 385, i.e., if sample of 385 respondents were used for the survey and get responses from everyone, it is more likely to get a correct answer with a maximum margin of error of 5%. For the ease of calculation, the sample size was rounded to 400. After the test of reliability and rejections of the misfits and excludes as provided by the test, the maximum sample was kept at 400.

The total number of samples (400) has been divided proportionately (200 employees from the State Bank of India and HDFC Bank respectively) on the basis of sector representation. The two organisations have been stratified as per the executive/officers and clerical divides, with proportionately calculated samples from each stratum, which have been involved in the whole banking activities of the banks. The study has not included the Class-IV employees. Simple random sampling technique was used to select the respondents from the study organisations. Each respondent was chosen randomly and entirely by chance in such a manner that each one has the equal probability of being chosen at any stage during the sampling process, and each subset of respondents has the same probability of being chosen for the sample as any other subset of individuals.

To check the reliability of the variables designed under the drafted questionnaire, the Cronbach's Alpha has been computed for each of the questions grouped under five dimensions of Sutton's Five-stage Evaluation Model. The Coefficient of Cronbach's Alpha has been calculated on the basis of the average correlation of the items within a test if the items are standardised whose values range from 0 to 1 as it is described as the coefficient of correlation. According to Bryman and Bell (2003), if the Cronbach's Alpha coefficient is greater than 0.9 it implies excellent, greater than 0.8 is Good, greater than 0.7 is acceptable, greater than 0.6 is questionable, greater than 0.5 is poor, and less than 0.5 is unacceptable (Mukhopadhyay and Gupta, 2014, Brink, 1993; Kopalle and Lehmann, 1997). During the analysis, it has to check if any of the items of the questionnaire has to be changed or not which affecting the outcome or not with respect to the reliability scale when those items were deleted from each dimension (Bryman and Bell 2003; AERA 1999; Cronbach, 1951; Hulin et.al, 2001; Peterson, 1994). If the

Cronbach's Alpha score gets increased when an item gets deleted shows that item is not the most appropriate to measure that dimension (Bryman and Bell, 2011; Ursachiet.al., 2015; Cameron and Trivedi, 2005; Cortina, 1993).

After putting the data collected from the Pilot Study for the analysis of reliability, it is found that the Cronbach's Alpha score is 0.926 whereas the Cronbach's Alpha based on Standardized Items is 0.812 (Table – 2). Total number of items put to the test are 50.The test score indicated that the data have relatively high internal consistency and is accepted for further analysis. It also suggests excluding 13 cases as they lack consistency with respect to the other responses. Each of the component variables with zero variance is removed from the scale while calculating the reliability. After identifying and deleting the excluded cases through trial-and-error basis, the study has undertaken further analysis with 400 sample cases.

Thus, no items of the questionnaire have been removed from the scale, the "Cronbach's alpha if item deleted" column shows that overall reliability would kept intact. The Cronbach's alpha score for the questionnaire data presented a high reliability for all the constructs as well as for the internal consistency of the dimensions of T and D, conûrming that the internal reliability of the primary survey was very high. In addition, the correlations across the parts were reliable. Thus, the Cronbach's alpha result indicates an adapted model with high reliability for its internal consistency. It is inferred that all the items / questions in the draft questionnaire are supposed to reflect the similar underlying construct, so respondents' scores on those items/ questions are correlated with each other. Thus, is reliable.

Kolmogorov–Smirnov test (K–S test or KS test), named after Andrey Kolmogorov and Nikolai Smirnov, is a nonparametric test which has been used to compare a sample with a reference probability distribution (Chakravarty, et al; 1967; Cacioppo and Petty, 1982; Petty et.al, 2009). If the output shows that 'Sig.' (p) is greater than (or equal) to .050, then it will be consequential to the fact that data are probably not different to a normal distribution and will make the data ready for further statistical analysis as the data collected are normally distributed. When the collected data has been put to KS Test, the following inference were found. All the tested major parameters are near to the normally distribution for the Sutton's five factor variables viz., for Need assessment (NA) the score is.172 with p = .000, for Design (DS) the score is.156 and p = .000, for Development (DV) the score is.184 and p = .000, for Implementation (IM) the score is .143, and p = .000; and for Post-program evaluation (PE) the score is .147, and p = .000. Likewise for the Kirkpatrick's four factors- Reaction, Learning, Behaviour, and Results, the scores of KS Test are .165, .171, .152 and .149 respectively (Table 2). Thus, the major parameters of the study are not different to a normal distribution and can be used for further analysis.

Table 2: Test of validity and normality through kolmogorov-smirnov test

Parameter	Statistics	df	Sig.		Statistics	df	Sig.
Need assessment	.172	399	.000	Reaction	.165	399	.000
Design	.156	399	.000	Learning	.171	399	.000
Development	.184	399	.000	Behaviour	.152	399	.000
Implementation	.143	399	.000	Results	.149	399	.000
Post-program evaluation	.147	399	.000				

Analysis

The pilot tested questionnaire had been administered on the employees of the HDFC Bank and SBI and their responses were recorded under 5-scales for the five-point variables under Sutton's model and four-point variables under Kirkpatrick's model. Then through analysis of descriptive statistics scores, it is found that the modal value of the differences of the mean score of various groups viz., officers and clerks, SBI and HDFC Bank employees, officers of both the banks and clerks of both the banks are very low except for some variables as highlighted in the Table 3. With reference to the Sutton's Five-Factor Model, the notable differences across the groups were found among the officers of both the banks and clerical cadres of both the banks with respect to the factor 'design'. The difference of mean score between officers of both the banks is also notable with respect to the factors- post program evaluation and level of effectiveness, so as between the officers and clerks for the factor – level of effectiveness.

As per the Kirkpatrick's Four-Level Model, the notable difference in the mean scores were found out between the clerical carders of both the banks and all employees of both the banks with respect to learning. The difference of mean score across all groups except all officers and clerks irrespective of banks and across the different cadre groups in both the banks, showed notable differences of the mean score too, with respect to the post-training behaviour. The same phenomenon has also recorded for the fourth factor- result.

The descriptive statistical analysis of the responses of the respondents have not inferred any conclusive trend or variances with respect to the intergroup and intragroup strata, which induced to use the Analysis of Variance or ANOVA test to find out the significance level of differences among the strata (Table 4).

As the SD values of all the groups are low in comparison to the mean scores, the ANOVA is the appropriate test to find out the significance of differences. The following inferences were found out with respect to the Sutton's Five Factor Model which are summed up as below:

Table 3: Descriptive analysis of factors as per Sutton's five stage model and Kirkpatrick's four-level model

Parameters		SBI Officer	HDFC Officer	SBI Clerks	HDFC Clerks	Officers	Clerks	SBI	HDFC	Total
					Sutton's Five Factor Model					
Respondents		112	120	88	80	232	168	200	200	400
Training Need Assessment	Mean	3.76	4.04	3.82	4.01	3.90	3.91	3.91	3.91	3.91
	SD	.969	.693	.939	.716	.930	.895	.817	.859	.839
Design	Mean	3.25	4.17	3.21	4.14	3.73	3.65	3.56	3.83	3.69
	SD	.947	.972	1.001	.793	.963	.979	.993	.994	.993
Development	Mean	3.37	3.73	3.09	3.25	3.56	3.17	3.23	3.56	3.39
	SD	.972	1.008	1.001	1.281	.937	.958	.967	.899	.919
Implementation	Mean	3.26	4.00	3.15	3.46	3.64	3.30	3.33	3.67	3.50
	SD	1.002	1.001	.937	.933	.764	.847	.895	.972	1.001
Post-program Evaluation	Mean	3.09	3.97	3.15	3.56	3.64	3.34	3.36	3.68	3.52
	SD	.799	.911	.886	.883	.915	.679	.897	.792	.989
					Kirkpatrick's Four-Level Model					
Reaction	Mean	3.38	3.97	3.89	4.02	3.69	3.95	3.60	3.99	3.80
	SD	0.872	0.793	0.819	0.883	0.954	0.937	0.836	0.846	0.844
Learning	Mean	3.49	4.45	3.41	4.61	3.99	3.98	3.45	4.51	3.98
	SD	1.008	0.967	0.899	.969	0.893	0.979	0.899	0.962	0.953
Behaviour	Mean	3.38	4.45	3.43	4.52	3.93	3.95	3.40	4.48	3.94
	SD	0.972	1.008	0.997	1.001	0.793	0.979	0.901	0.981	0.937
Result	Mean	3.46	4.71	3.81	4.75	4.11	4.26	3.61	4.73	4.17
	SD	0.993	0.994	1.001	0.991	1.008	1.281	0.799	0.897	0.886
Level of Effectiveness	Mean	3.13	4.11	3.27	4.01	3.98	3.05	3.78	4.01	3.98
	SD	0.799	0.911	0.886	0.883	0.915	0.679	0.897	0.792	1.032

- Training need assessment (NA): The differences of the mean scores among the groups are not significanct either in 5% or 10% level of significance.
- Design (DS): The differences of the mean scores among the groups except the strata of the SBI and HDFC Officers, and Clericals groups of these banks are not significanct either in 5% or 10% level of significance.
- Development (DV): The differences of the mean scores among the groups are not significanct either in 5% or 10% level of significance.
- Implementation (IM): The differences of the mean scores among the groups are not significanct either in 5% or 10% level of significance.
- Post-program evaluation (PE): The differences of the mean scores among the groups except the strata of the SBI and HDFC Officers are not significanct either in 5% or 10% level of significance.

Table 4: Test of ANOVA to analyse the differences in Factors as per Sutton's Five Stage Model and Kirkpatrick's Four-Level Model

Variables	Sub Groups of Respondents	Mean Score	Difference F Score	p value	Significance at 5% level (2-tailed)
		Sutton's Five Factor Model			
Training Need Assessment	SBI vs HDFC Officer	0.28	1.975	.621	NS
	SBI vs HDFC Clerical	0.19	1.574	.789	NS
	Officer vs Clerical	0.01	0.921	.972	NS
	SBI vs HDFC	0.00	0.041	.991	NS
	Officer vs Clerical - SBI	0.06	1.296	.899	NS
	Officer vs Clerical- HDFC	0.03	1.219	.899	NS
Design	SBI vs HDFC Officer	0.92	9.876	.001	Significant
	SBI vs HDFC Clerical	0.93	10.001	.000	Significant
	Officer vs Clerical	0.08	0.567	.889	NS
	SBI vs HDFC	0.26	1.319	.549	NS
	Officer vs Clerical - SBI	0.05	1.189	.901	NS
	Officer vs Clerical- HDFC	0.03	1.189	.901	NS
Development	SBI vs HDFC Officer	0.36	1.416	.909	NS
	SBI vs HDFC Clerical	0.16	1.118	.899	NS
	Officer vs Clerical	0.39	1.341	.991	NS
	SBI vs HDFC	0.33	1.296	.899	NS
	Officer vs Clerical - SBI	0.28	1.219	.899	NS

Contd...

	Officer vs Clerical- HDFC	0.48	1.475	.683	NS
Implementation	SBI vs HDFC Officer	0.75	1.523	.619	NS
	SBI vs HDFC Clerical	0.30	1.043	.990	NS
	Officer vs Clerical	0.34	1.439	.990	NS
	SBI vs HDFC	0.34	1.416	.846	NS
	Officer vs Clerical - SBI	0.10	0.736	.900	NS
	Officer vs Clerical- HDFC	0.55	1.116	.872	NS
Post Program Evaluation Significant	SBI vs HDFC Officer	0.88	9.675	.003	
	SBI vs HDFC Clerical	0.42	1.488	.711	NS
	Officer vs Clerical	0.30	1.563	.881	NS
	SBI vs HDFC	0.33	1.632	.901	NS
	Officer vs Clerical - SBI	0.06	0.116	.946	NS
	Officer vs Clerical- HDFC	0.40	0.598	.719	NS
Kirkpatrick's Four-Level Model					
Reaction	SBI vs HDFC Officer	0.59	2.190	.763	NS
	SBI vs HDFC Clerical	0.13	2.109	.721	NS
	Officer vs Clerical	0.27	1.987	.972	NS
	SBI vs HDFC	0.39	1.997	.971	NS
	Officer vs Clerical - SBI	0.51	1.895	.928	NS
	Officer vs Clerical- HDFC	0.05	1.001	.889	NS
Learning	SBI vs HDFC Officer	0.96	9.897	.001	Significant
	SBI vs HDFC Clerical	1.20	11.029	.000	Significant
	Officer vs Clerical	0.01	1.003	.886	NS
	SBI vs HDFC	1.06	10.764	.000	Significant
	Officer vs Clerical - SBI	0.08	1.977	.967	NS
	Officer vs Clerical- HDFC	0.16	1.995	.973	NS
Behaviour	SBI vs HDFC Officer	1.07	11.096	.000	Significant
	SBI vs HDFC Clerical	1.09	11.074	.000	Significant
	Officer vs Clerical	0.02	1.523	.679	NS
	SBI vs HDFC	1.08	11.189	.000	Significant
	Officer vs Clerical - SBI	0.05	1.632	.901	NS
	Officer vs Clerical- HDFC	0.07	1.975	.882	NS

Contd...

Result	SBI vs HDFC Officer	1.25	11.742	.000	Significant
	SBI vs HDFC Clerical	0.94	9.986	.001	Significant
	Officer vs Clerical	0.15	1.413	.884	NS
	SBI vs HDFC	1.11	9.929	.001	Significant
	Officer vs Clerical - SBI	0.35	1.119	.869	NS
	Officer vs Clerical- HDFC	0.04	1.351	.981	NS

The following inferences were found out with respect to the Kirkpatrick's Four-Level Modelwhich are summed up as below:

- Reaction: The differences of the mean scores among the groups are not significanct either in 5% or 10% level of significance.
- Learning: The differences of the mean scores among the groups except the strata of the SBI and HDFC Officers, and Clericals groups of these banks are not significanct either in 5% or 10% level of significance. The difference of the mean score among the two banks under study are also found to be significant at 5% level of significance.
- Behaviour: The differences of the mean scores among the groups viz., officers of both the banks, clerks of both the banks, and among the employees of the SBI and HDFC bank are significant at 5% level of significance.
- Result: Like the factor – behaviour, the differences of the mean scores among the groups viz., officers of both the banks, clerks of both the banks, and among the employees of the SBI and HDFC bank are significant at 5% level of significance.

Table 5: Test of ANOVA to analyse the level of effectiveness of T and Das per Sutton's Five Stage Model and Kirkpatrick's Four-Level Model

Variables	Models adopted	Groups under study	Difference of Mean Score	F Score	p	Significance
Level of Effectiveness of T and D	Kirkpatrick's Four-Level Model	SBI vs HDFC	0.98	7.682	.003	Significant
	Sutton's Five Factor Model	SBI vs HDFC	0.74	1.547	.602	NS

The responses of all the beneficiaries of the T and D initiatives of both the banks were recorded in the 5-point Likert scale and then have been analysed. The

outcome of the ANOVA as presented in the Table 5 indicated a difference in the result with respect to the level of effectiveness of T and D across the banks under study, SBI and HDFC Bank, based on the two models. The Kirkpatrick's Four-Level Model shows a significant difference across the sampled banks whereas the Sutton's Five Factor Model inferred an opposite result, at 5% level of significance.

Conclusion

The Kirkpatrick's model has been used to gain the information to improve the future training programmes by analysing the effectiveness of the content, the course leader, the facilities, the schedule, training aids and general co-ordination, specifically (Sugrue and Kim 2004; Parry, 1997; Garavaglia 1998). Influenced by the dynamic and changing economic environment, various banking organisations have felt the urge of developing the HR to adapt the change. The requirement for the sustainable use of scare resources in the long-run is the proper training and development of employees, therefore the organization must be dynamic in order to achieve results-oriented goals by utilising its capabilities and skill. Assessment of the T and D needs, fair administration policy for the T and D programs, best management efforts for implementation for the change, and the post-program evaluation, as proposed by the Sutton's Five Factor Modelare the key to the organisational success (Cohen, Manion et al. 2000).

Kirkpatrick viewed the acquisition of knowledge as an essential precondition for behavioural change, which lead to an improved performance whereas Sutton's view is based on the changes in behaviour as a result of creation of an eco-system of knowledge which starts with the need assessment and ends with evaluation and corrective measure i.e., a wholistic view of T and D. As the T and D environment has different segments, the shortfall of one segment has been balanced through another segment. Thus, the significant difference of the Level of Effectiveness of T and D analysed through the Kirkpatrick's Four-Level Model has been reversed by the Sutton's Five Factor Model. It is in the line of the result derived by various studies undertaken by Kaufman, Keller et al., 1996;Abernathy 1999; Islam, 2004; Phillips and Stone, 2002; and Cross, 2004.

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