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Arthavati
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ARTHAVATI

Arthavati : An International Journal

Editorial

Indian Economy is one of the fast growing economies of the world. Despite political upheavals and shift in the economic ideals of the ruling parties there has been a consistent growth in the past two decades. The main reason behind this is the emerging service sector industry which has added to the strength to the economy even when the manufacturing sector and agriculture suffered a significant fall in their activities. The demographic characteristics of Indian population have also a bearing upon this fact as India is the youngest country of the world where a huge proportion of the population is about twenty nine years of age. So, presently we have the biggest work force which is available in the nation and a significant part of it is serving abroad thus adding to the GDP as well as becoming a world leader in technological knowhow.

Last one and a half year has been a bit too tumultuous in Indian economy. The decision of demonetization and later the implementation of General and Services Taxes led to a massive debate in Indian economy and caused a major slowdown in the initial months of demonetization. History will tell whether the two steps could attain the objectives they were taken for. The immediate impact, however, has been a major jolt to the small and medium industry and business. As a researcher one would find it interesting to examine the impact of these steps on the various sectors of economy and sections of society. The widely pronounced objectives of making the Indian society cashless and later, the talk of less cash proved to be only hollow as one year after the self-proclaimed demonetization the amount of currency in India market was much more than the amount which was in circulation on the day demonetization was announced. No doubt, the share of online market increased in this duration but this is too small to radically affect the consumer behaviour in this country.

The biggest factor which has influenced the health of Indian economy is agriculture. The issue of farmer's suicides because of their inability to pay back loans of the banks became the most contentious issue in the last assembly elections and shall be also an equally powerful factor in deciding the Lok Sabha polls. This is the reason why both the major political parties have been trying to woo the peasants through promises of a number of loan waivers once they are elected to power. How far it will be effective in elections is also a subject of research and study.

The government of India has put forward the budget for the financial year 2019-20. This is the sixth budget presented by NDA government. This itself has become a topic of debate whether a government which has been elected for a period of five years, should go in for presenting a sixth budget just before the country goes to polls. There has been a variety of responses to the budget proposal. This has been seen as a purely election budget in which popular sentiment has been addressed. To boost up the image of a nationalist government, the outlay on defense has been increased to the highest ever of a sum more than three lakh crores. But contrarily outlay on education has been decreased and the outlay on higher education has been decreased considerably. In fact except for the first five year plan, it has not reached the recommended six percent of GDP stated in Kothari Commission report as well as in NPE 1986.

The merger of banks has also been a debatable issue in the past one year. The transfer of capital of smaller banks to one big bank has its pro and cons. However, the soup in which Chanda Kochar finds herself or what Arundhati Bhattacharya has said to have done in Australia for the Ambanis is also to be investigated. A researcher can take up such economic decisions for study and assess their viability. This number of the journal explores some of these issues is the articles that are published here.

The editorial team does not own responsibility for the data presented in the research articles nor for the inference made. The responsibility of the entire information in the articles rests with the authors. However, new ideas are always welcome to improve the quality, content and authenticity. We would welcome opinions, suggestions and corrections, if any by the readers.

Prof. Suman Pamecha

Contents

Economic Implications of Demographic Changes in India

* Ms. Beena Patel

Abstract

Like other countries of the world, India is also experiencing demographic shifts in its population structure. Since the efforts for socio-economic upliftment is associated with improvement in education and health condition as well as development of infrastructural facilities, the demographic composition is altered. Consequently, the growth process of the country is also affected. The present study deals with the economic implications of demographic changes in India. The change in the demographic composition is examined for age structure, sex ratio, rural-urban distribution of population and social class. The variations in economic growth due to demographic change are explained with the help of regression model. The study suggests that a country can increase its economic gains from the increasing share of working age population provided that it should focus on the quality of its potential human resources by providing the appropriate facilities to convert them into a productive human being.

Keywords: Demographic Change, Working Age Population, Economic Growth, Regression results

1. Introduction

Several countries of the world have experienced various changes at the demographic front. Demographic change occurs when the size, structure and distribution of population changes in response to change in birth rate, death rate, fertility rate, life expectancy and migration. These factors change naturally or due to policy intervention. In the past, several policy efforts have been made as a part of socio-economic development of the country. This includes development of medical and infrastructural facilities, employment generation, expansion of education and several awareness generation campaigns. Consequently, gradual demographic shifts have occurred which may be broadly categorized as age composition, sex ratio, rural-urban distribution and social class based distribution.

Like other countries of the world, India is also experiencing demographic shifts in its population structure. Its share of working age population (15-59 years) is continuously increasing in comparison to dependent population (below0-14 years and above 60 years of age). Besides, India's population is divided broadly into different classes viz. Scheduled Caste (SCs), Scheduled Tribe (STs), Other Backward Class (OBCs) and General. Among them, the population under Scheduled Caste and Scheduled Tribe category is

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gradually increasing. Also, India has a lopsided pattern of development. Some states/regions in the country are highly developed and some are less developed or backward. Due to lack of opportunities in the backward regions, people have a tendency to migrate to developed regions or urban areas. This increases the concentration of population in urban areas. Since population is one of the components of growth of the country, the demographic change in the country should have implications for its economic growth.

Regarding the change in age structure in favour of working age group, the existing literature shows a positive impact of increase in working age population of the country on its economic growth (Lee and Mason, 2007; Song, 2013; Joe et al., 2015; Aiyar and Mody, 2011; Majumder, 2013; Bloom et al., 2011 among others). Dike et al. (2014) found sustainable long run equilibrium relationship between economic growth and population growth. Prettner and Trimborn (2012) reported that in response to demographic change, technological progress and economic growth accelerate in the medium run but slowdown in long run .hagat (2014) has described that increased labor supply eventually results into increase in goods and services on the one hand and declining child dependency ratio will boost savings and investment on the other. However, for India, the studies have found both opportunities and challenges due to increase in population in the working age group. James (2011) has observed opportunities due to higher potential among the working age group to contribute to rapid economic growth of the country, while challenges are observed in terms of lack of homogeneity in transition across states in the country. Thakur (2012) explained that the favorable age structure of population plays a key role in promoting economic growth with good policies and institutions. The study stated that India will be able to capitalize on its favorable age structure depending on how well the BIMARU states are able to reform their economy. Jain (2016) emphasized on providing education and skill on the one side, and employment generation on the other, so that population in the working age group can be productively utilized for economic growth of the country. Bhagat (2014) also advocated that demographic benefits may not be realized automatically but it depends upon the right economic policy (particularly employment, education, health and skill development).

The studies have also advocated for the positive impact of favorable sex ratio economic growth (Angrist, 2002; James, 2011; Bhattacharya, 2012; Dasgupta et al., 2003). Wei and Zhange (2011) in a study on China used panel regression for the year 1980 and 2005. The study found that regional domestic product tends to grow faster in provinces with higher sex ratio. James (2011) in a study related to demographic transition in India emphasized on sex ratio along with human capital for attainment of balanced economic growth. Bhattacharya (2012) suggested that the increase in sex ratio and reduced gender imbalances probably have better prospects of sustained economic growth in the near future. Wei and Zhange (2009) in a study on China conducted during the period 1990-2005 confirmed that an increase in household savings rate is attributed to the rise in the sex ratio. Golley and Tyers (2012) in a study on China found that decrease in the population of women ultimately results into decrease in labour supply. The study stated that gender imbalances have other widely noted undesirable consequences, which adversely affect the economic growth rate. Agnihotri (2003) and Nagaraja (2013) advocated that development could not take place, if there is existence of disproportionate sex ratio in the country.

Considering the importance of each and every individual of the country in economic growth, focus of the studies has also been on upliftment of the social backward classes and bringing them at par with the main stream of development (Das, 1999; Deb, 2017; Thorat and Dubey, 2012 and Deshpande, 2013). Borooah (2005) suggested that to reduce inequality and poverty, there is a need for empowerment of weaker section and reduce caste-based discrimination through redistribution of resources. Das (1999) also emphasized on expansion of human capabilities for increasing the participation of weaker section in the growth process. For the equal participation of people from different social groups, the studies have suggested for adapting inclusive growth strategy (Ali and Son, 2007; Borooah et al., 2014; Thorat and Newman, 2007; Narayan, 2008; Vellala et al., 2014; Motiram and Sarma, 2011 among others).

The change in geographical distribution of population is generally considered in terms of shifting of population from less developed to more developed countries or from rural to urban areas. Several studies have accepted that increase in the concentration of population in urban area contributes to economic growth (Tripathi, 2013; Henderson et al., 2017: Bhagat, 2012; Turok and McGranahan 2013; Bhagat, 2017 among others). Dutt and Ravallion (2011) examined that after the economic reforms in India, urban economic growth has provided more opportunities to rural people in terms of employment and wages. The study experienced that poverty reduced and standard of living increased in both rural and urban areas. Ao et al. (2015) explained rapid urbanization and industrialization in China since 1987 and observed an increasing number of rural people migrating to urban area for jobs. The study argued that higher wages in urban areas have improved the standard of living of rural people. Arouri et al. (2014) stated that urbanization is related to concentration of human capital, which supports the growth of the country. In contrast, Kundu (2009),Lakshmana (2013), Colmer(2016), Kumar(2010) and Arouri et al.(2014) have described that rural-urban migration and uneven growth of urbanization created disparity in income level and quality of basic amenities in the regions.

The present study deals with the economic implications of demographic changes in India. Since the efforts for socio-economic upliftment is associated with improvement in education and health condition as well as development of infrastructural facilities, the demographic composition is altered. Consequently, the growth process of the country is also affected. With this background, the objectives of the present study are as follows:

1)   To examine the demographic change in India.

2)   To identify the shifts in the demographic composition in terms of age structure, sex ratio, rural-urban distribution and social class based distribution.

3)   To compare the demographic change with economic growth.

4)   To determine the causal relationship between demographic change and economic growth.

The study is structured as follows: Section-I contains introduction with objectives of the study. Section-II discusses the methodology adopted. Section-III examines the population trends in India. Section-IV analyses the change in demographic distribution of India's population. Section-V compares the demographic change

with economic growth. Section-VI determines the economic implications of demographic change. Section-VII concludes the study.

2. Methodology

The trends of population growth are examined at both India and state level. The change in the demographic composition is examined forage structure, sex ratio, rural-urban distribution of population and social class. Economic growth of the country is measured in terms of Per Capita Income. In order to adjust the income for price changes, PCI is deflated for the year 2011-12 by using Wholesale Price Index. The relationship between economic growth and demographic change is examined with the help of correlation coefficients. The variations in economic growth due to demographic change are explained with the help of regression model as shown below:

$$EG = \beta_0 + \beta_1 DNP + \beta_2 SXR + \beta_3 URB + \beta_4 WAP + \beta_5 SB + \beta_6 TD + e_t$$

Where EG is Economic Growth, DNP is Density of Population, SXR is Sex Ratio, URB is Urbanization, WAP is percentage of population in Working Age Group, SB is Social Backwardness and TD is Time Dummy. β_0 is the intercept term and et is the error term.

2.1 Description of Explanatory Variables and Hypothesis

1) Density of population

The density of population is expressed as the number of persons per square kilometer. The population density is one of the important indicators of economic growth. On the one hand, an increase in population density stimulates the economic growth, as there are more hands to contribute to economic activity. On the other hand, the increase in population density after a certain limit suppresses the economic growth, as the available resources becomes scarce as compared to the size of the population. Thus, relationship between density of population and economic growth is hypothesized as open-ended.

2) Percentage of Population in Working Age Group

The population in the working age group (15-59 years) is considered to be economically active. The gainful employment of this age group of population implies more production than consumption, saving thus translating into investment, which further augments the economic growth. The term is now a day interpreted as demographic dividend. However, if this group of population is not gainfully employed, they sometimes become a demographic curse, putting lot of burden on the economy. Thus, relationship between percentage of population in the working age group and economic growth is hypothesized as open-ended.

3) Sex Ratio

Sex ratio is an indicator of female's status in the society. An increase in sex ratio reflects the development of society against the outmoded attitudes and beliefs towards women. This implies liberation of women from

the clutches of social evils. This enables the female to enjoy her rights to which she is entitled and contribute to the economy. Therefore, a high sex ratio should imply an increase in economic growth. Thus, a positive sign is hypothesized between sex ratio and economic growth.

4)   Urbanization

Urbanization refers to increase in percentage of urban population. The population in the urban area increases because of better health facilities. Also the better facilities and employment opportunities in the urban area attracts the people from rural area for improving their living standards. The availability of employment opportunities in various sectors enables the migrants to utilize their potential to the maximum extent. As a result, the contribution to nation's income increases. However, if the population increase in the urban area crosses its carrying capacity, this creates social unrest resulting into economic loss. Therefore, relationship between urbanization and PCNSDP is hypothesized as open-ended.

5)   Social Backwardness

The social class based distribution of population comprises Scheduled Caste, Scheduled Tribes, Other Backward Class and General. Among them, the share of SCs and STs in total population comprises the socially backward group. It is deprived section of the society and are lagging behind the mainstream of development. In order to have more family income, they generally prefer large family size. The government also spares funds for their upliftment. The increase in the size of population in the socially backward category implies diversion of more resources for improving their socio-economic condition, which otherwise could be used for some other productive activity. Thus, the sign for social backwardness and PCNSDP is hypothesized as negative.

6)   Time Dummy

The time dummy is used in order to measure how the economic growth responds with time. Keeping the other factors constant, the economic growth sometimes is self-perpetuating. To measure this effect, the previous year is assigned the value zero and the current year is assigned the value 1. The data are pooled for the years 2001 and 2011. Since the growth related factors automatically respond to time, a positive sign is hypothesized between time dummy and economic growth.

2.2 Database

The present study is based upon the secondary sources of data. The data on population trends, age structure, rural-urban population, sex ratio at all India's well as state level are obtained from the sources like Census of India, Economic survey 2013-14 and report on National Health Profile, 2013, Registrar General of India, Ministry of Home Affairs, GOI .The data on social class wise distribution of population is taken from Socio-Economic and Caste Census, 2011, Government of India. Per capita net state domestic product is obtained from the official website of planningcommission.nic.in.The projected data of working age population from

2011 to 2091in India is procured from official websites of Future Population of India, Population Reference Bureau (www.popfound.org). The dataset is prepared for the years 2001 and 2011.

3. Population Trends in India

The population trends in India from 1901 to 2011 are shown in table 1. During the period, population of India has quadrupled. It has increased from 238.40 million in 1901 to 1210.57 million in 2011. Despite negative growth rate in 1921 , the decadal growth rate of population has remarkably increased to 25 percent by 1971 and after that, it has shown a continuous decrease. By 2001-2011, the decadal growth rate has reached 18 percent.

Table 1
Population Trends in India

Year	Population (In Millions)	Decadal Growth (in %)	Density(Per. Sq. Km)
1901	238.4	-	77
1911	252.1	5.75	82
1921	251.3	-0.31	81
1931	279.0	11.00	90
1941	314.7	12.79	103
1951	361.1	14.75	117
1961	439.2	21.64	142
1971	548.2	24.80	177
1981	683.3	24.66	216
1991	846.4	23.87	267
2001	1028.7	21.54	325
2011	1210.6	17.68	382

The negative growth rate in 1921 is known as the 'Year of Great Divide' due to occurrence of epidemics like cholera, plague, influenza and famine.

Source: (1) Registrar General of India, Population Enumeration Data, Table A-2, Decadal Variation in Population since 1901, (2) Census of India, 2011.

The higher rate of decrease in death rate as compared to birth rate (Annexure 1) has resulted into increase in population of the country. Accordingly, the density of population has increased from 77 to 382 persons per sq. km.

3.1 Population Change across the Indian States

Table 2 determines the change in population in Indian states from 1951 to 2011. The states are categorized according to their population ranges. In 2011, all the states have maintained the same categories as of 1951 except Tamil Nadu and Kerala. Tamil Nadu, which was in the III category in 1951, has shifted to IVth category in 2011. Kerala has shifted from IVth category in 1951 to Vth category in 2011.

Table 2
Population Change in Indian States (1951 to 2011)

Category	1951		2011	
	Population Range (in thousands)	States	Population Range (in thousands)	States
I	>48001	Uttar Pradesh	>160001	Uttar Pradesh
II	36001-48000	-	120001-160000	-
III	24001-36000	Maharashtra, Andhra Pradesh, Tamil Nadu, Bihar, West Bengal	80001-120000	Maharashtra, West Bengal, Bihar, Andhra Pradesh,
IV	12001-24000	Karnataka, Madhya Pradesh, Gujarat, Rajasthan, Odisha, Kerala	40001-80000	Madhya Pradesh, Tamil Nadu Rajasthan Karnataka, Gujarat, Odisha
V	<12000	Jharkhand, Punjab, Assam, Chhattisgarh, Haryana, Jammu & Kashmir, Uttarakhand, Himachal Pradesh, Tripura, Meghalaya, Manipur, Goa, Nagaland, Mizoram, Sikkim	<40000	Kerala, Jharkhand, Assam, Punjab, Haryana, Chhattisgarh, Jammu & Kashmir Uttarakhand, Himachal Pradesh, Tripura, Meghalaya, Manipur Nagaland, Goa Arunachal Pradesh, Mizoram, Sikkim

Source: Office of the Registrar General of India, Ministry of Home Affairs & Economic survey 2013-14, GOI

Only Uttar Pradesh has the highest population, which is above 160 million. Maharashtra, Andhra Pradesh, Bihar and West Bengal have population in the range of 80 to 120 million, while Karnataka, Madhya Pradesh, Gujarat, Rajasthan and Odisha have population in the range of 40 to 80 million. Rest of the states has population less than 40 million.

4.   Change in Demographic Distribution of India's Population

The population changes in a country is associated with change in the characteristic of age structure sex ratio, rural-urban distribution of population and social class wise distribution of population. This section examines the demographic distribution of population under the various characteristics, viz., age structure, sex ratio, rural-urban distribution and social class based distribution of population.

4.1   Change in Age Group Wise Distribution of Population

The change in age group wise distribution of population is presented in table 3 for the last four decades. It is revealed that the share of population in the age group 0-14 years has decreased from 40 percent in 1981 to 31 percent in 2011, while in the age group of 15-59 years; the share of population has increased from 54 percent in 1981 to 60.3 percent in 2011. However, in the age group of 60 years and above, the share of population has increased from 7 to 9 percent during the same period.

Table 3
Age Group Wise Change in Total Population

Age Groups	Year			
	1981	1991	2001	2011
0-4	12.6	12.2	10.7	9.3
5-9	14.1	13.3	12.4	10.5
10-14	12.9	11.8	11.9	11.0
15-19	9.6	9.4	9.3	10.0
20-24	8.6	8.9	8.8	9.2
25-29	7.6	8.3	8.4	8.4
30-34	6.4	7.0	7.4	7.3
35-39	5.9	6.2	7.0	7.0
40-44	5.1	5.1	5.2	6.0
45-49	4.4	4.3	4.5	5.1
50-54	3.8	3.7	3.4	4.1
55-59	2.5	2.5	2.8	3.2
60-64	2.7	2.7	2.8	3.1
65-69	1.4	1.5	2.1	2.2
70+	2.4	2.5	2.9	3.4

Source: Office of the Registrar General, Ministry of Home Affairs, Government of India

The change in distribution of population across different age groups is also presented with the help of pyramids (fig 1). On comparing the pyramids in figure 1(a) and 1(b), it is observed that the shift in the population towards the higher age group is supposed to give the pyramid a spindle type shape. This confirms the gradual shift of the population towards the working age group.

Figure 1
Population Pyramid
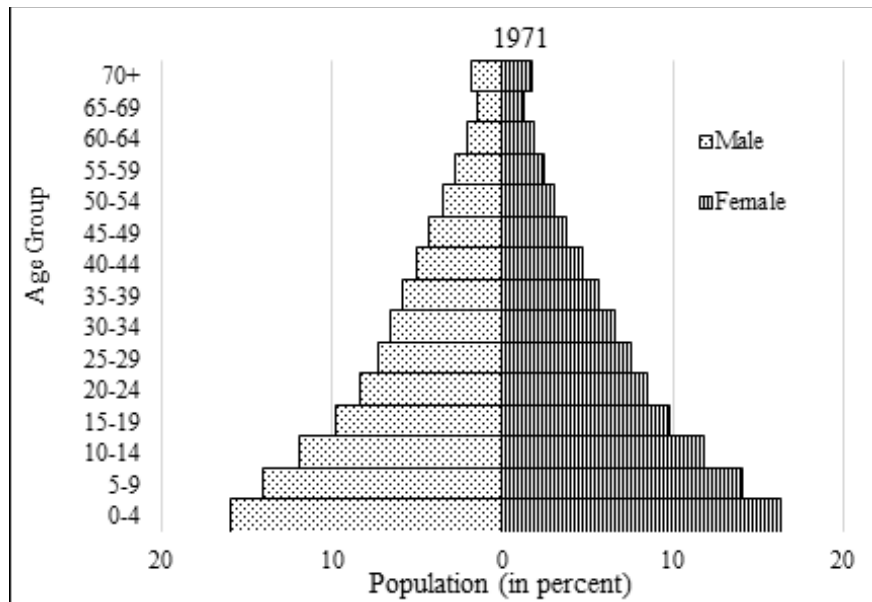
(a)   *Source: Census of India, 1971*
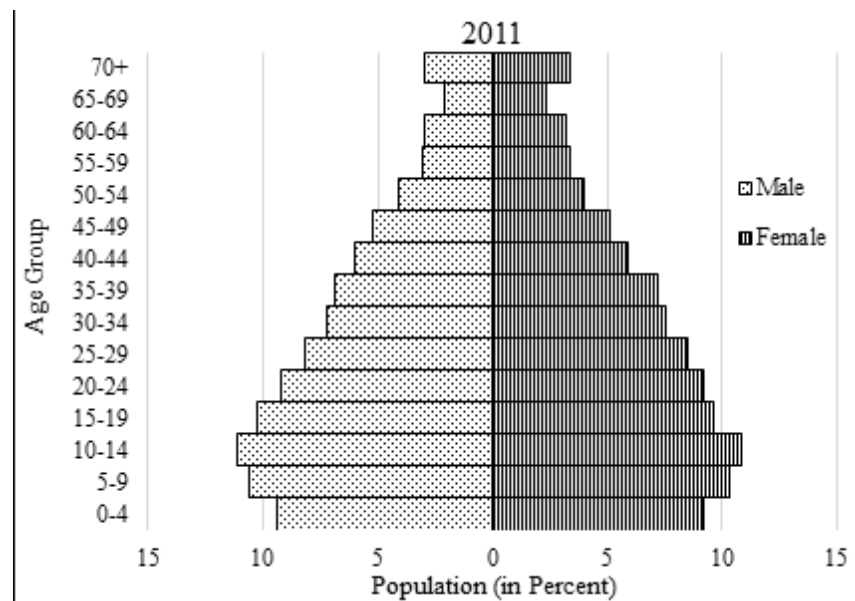
(b)   *Source: Census of India, 2011*

4.1.1 Projections for Population in the Working Age Group

In order to know future trends of working age population, population projections are shown in figure 2till 2091. The population in the working age group is increasing and it is likely to reach its peak during 2031 and after that, it is expected to decrease. From the figure, it is evident that India is likely to remain at the favorable demographic situation till 2091. This implies that India has the potential to reap the demographic dividend for a longer time.

Figure 2
Population Projections according to Working Age Group in India
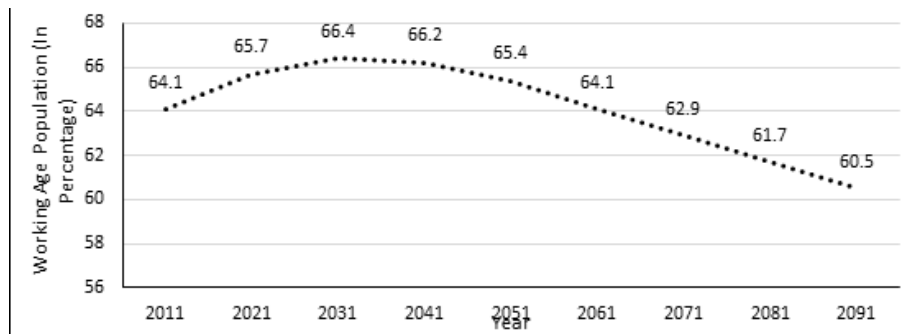
Source: Future Population of India, Population Reference Bureau (2007)

4.2   Change in Sex Ratio

On account of existence of patriarchal norms in Indian society, there is high preference for male child. This is visualized from the increase in female feticide, female infanticide, dowry suicide, divorce suicide and dowry death (Annexure 2). Consequently, the sex ratio has turned in favour of males. Figure 3(a) shows that number of females per thousand males has decreased from 972 in 1901 to 927 in 1991 with some fluctuation. Since 2001 onwards, some increase is observed in sex ratio. This could be due to several awareness programs for importance of females in the society. However, sex ratio has still not reached to the favorable point.

Figure 3
Sex Ratio in India (Since 1901)
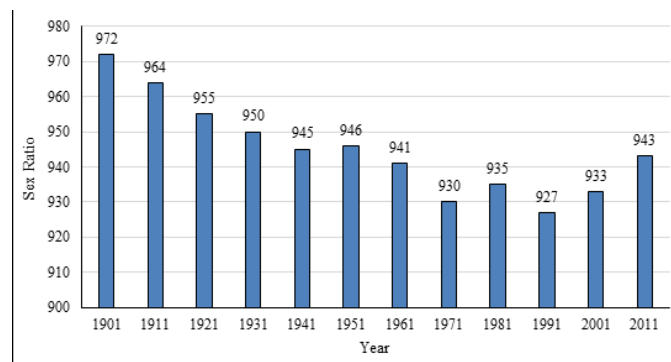
(a)   *Source: Office of the Registrar General, India*

A higher share of working age population in total population enables the country to reap the demographic dividend (as discussed in Bloom et al., 2011; Bhagat, 2014; Mody and Aiyar, 2011; Ladusingh and Narayan, 2011; Thakur, 2012; Kumar, 2010; Talreja 2014 among others).

The age group wise distribution of sex ratio (as showing in fig. 3(b)) reported that it is highly unfavorable for the population below the age of 14 years. From 1991 to 2011, it has decreased from 931 to 916. For the population in the age group of 15-59 years, increase is observed from 925 in 1991 to 961 in 2011. The sex ratio is found to be highly favorable in the age group of 60+ years. From a low figure of 914 in 1991, it has increased to 1027 in 2011. This is on account of higher increase in life expectancy of females as compared to males (Annexure 4).The poor sex ratio below the age of 14 years and between 15-59 years is a cause of concern as it determines the further potential of economic growth.

Figure 3
Age Group Wise Sex Ratio
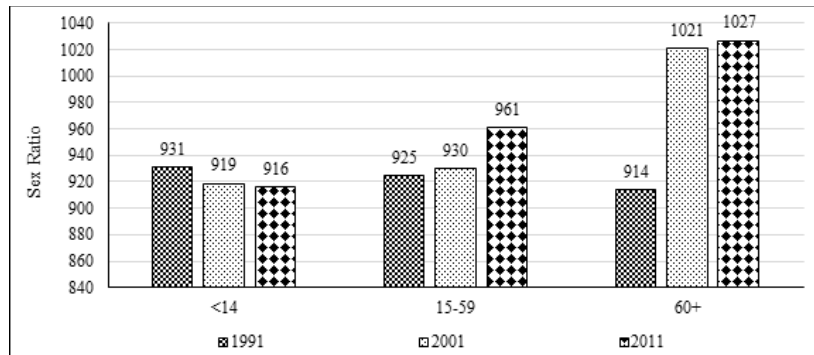
(b)   *Source: Office of Registrar General, India*

4.3   Change in Rural-Urban Distribution of Population

The change in rural-urban distribution of population in India from 1901 to 2011 is presented in figure 4. On comparing the trends of rural and urban population, it is evident that the growth rate of rural population has always been greater than the growth rate of urban population. However, the urban population is increasing at a higher rate (11.6 %) as compared to rural population (5.8 %). This has resulted into narrowing down of gap between the trend lines of rural and urban population over the time. The comparatively better infrastructure, health and educational facilities and opportunities in the urban area attract the population from the rural area. This increases the growth rate of population in urban area.

Figure 4
Change in Rural-Urban Distribution of Population
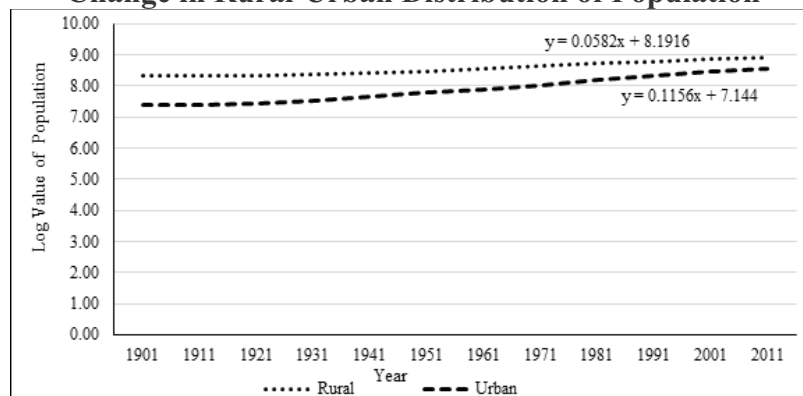
Source: Office of Registrar General, Census of India, 2011

4.4   Change in Distribution of Population among Social Classes

The change in distribution of population among social classes in India from 1951 to 2011 is depicted in table 4. During the period, the population of Scheduled Caste has increased from 15 percent in 1951 to 17 percent in 2011 and the population in Scheduled Tribe has increased from 5 percent to 9 percent. This is reflected in terms of overall social backwardness from 20 percent to 25 percent since 1951. On the contrary, the population in category other than SC/ST has decreased from 80 percent in 1951 to 75 percent in 2011.This implies indication of more funds for the upliftment of socially backward classes and hence more financial burden.

Table 4
Change in Distribution of Population among Social Classes (In Percent)

Years	SCs	STs	Other than SC/ST	Social backwardness
1951	14.39	5.36	80.25	19.75
1961	14.67	6.80	78.53	21.47
1971	14.60	6.93	78.47	21.53
1981	15.33	7.56	77.11	22.89
1991	16.33	8.01	75.66	24.34
2001	16.20	8.20	75.60	24.4
2011	16.63	8.61	74.75	25.25

Source: Socio-Economic and Caste Census, 2011, Government of India.

5.   Comparison between Demographic Change and Economic Growth

The comparison between demographic change and economic growth in major states of India is presented in table 5. The states having high level of economic growth have moderate to low level of population, high to moderate level of percentage of working age population, high to moderate level of urban population and low to moderate level of social backwardness. These states are Haryana, Uttarakhand, Kerala and Karnataka. Gujarat and Punjab have moderate level of economic growth and have moderate to low level of population, high to moderate level of percentage of working age population, high level of urban population and high to moderate level of social backwardness. The states which have low level of economic growth and have high level of population, low level of percentage of working age population, moderate to low level of sex ratio as well as urban population. These states are Bihar, Uttar Pradesh and Madhya Pradesh.

Table 5
Comparison between Demographic Change and Economic Growth (2011)

States	Population (in thousands)	Decadal Growth Rate of Population (in %)	Density of Population (Per Sq. Km)	Working Age Group (15-59) (in %)	Sex Ratio	Urban Population (in %)	Social Backwardness (in %)	Economic Growth (in thousands)
Andhra Pradesh	84581 (4)	11.1 (18)	308 (11.5)	63.5 (6)	992 (3)	33.36 (8)	23.41 (9)	69000 (10)
Assam	31206 (13)	16.93 (11)	397 (8)	60.3 (11)	957 (9)	14.10 (17)	19.60 (16)	41142 (16)
Bihar	104099 (3)	25.07 (1)	1102 (1)	52.2 (19)	917 (15)	11.29 (18)	17.20 (18)	21750 (19)
Chhattisgarh	25545 (15)	22.59 (3)	189 (16.5)	60.2 (12)	990 (4)	23.24 (14)	43.44 (1)	55177 (12)
Gujarat	60440 (9)	19.17 (9.5)	308 (11.5)	62.9 (8)	919 (14)	42.60 (4)	21.50 (12)	87481 (8)
Haryana	25351 (16)	19.9 (8)	573 (4)	61.5 (9.5)	878 (19)	34.88 (7)	20.17 (15)	106085 (1)
Himachal Pradesh	6865 (19)	12.81 (17)	123 (18)	63.8 (5)	971 (7)	10.03 (19)	30.90 (7)	87721 (7)
Jammu &Kashmir	12541 (17)	23.71 (2)	56 (19)	58.8 (14)	888 (18)	27.38 (11)	19.28 (17)	53173 (13)
Jharkhand	32988 (12)	22.34 (4)	414 (7)	56.5 (17)	949 (10)	24.05 (13)	38.29 (3)	41254 (15)
Karnataka	61095 (8)	15.67 (13)	319 (10)	64.2 (2)	972 (6)	38.67 (5)	24.10 (8)	90263 (6)
Kerala	33406 (11)	4.86 (19)	859 (2)	63.9 (3.5)	1084 (1)	47.70 (2)	10.55 (19)	97912 (4)
Madhya Pradesh	72627 (5)	20.3 (6)	236 (14)	58.7 (15)	930 (11)	27.63 (10)	36.82 (4)	38551 (17)
Maharashtra	112374 (2)	15.99 (12)	365 (9)	63.2 (7)	929 (12)	45.22 (3)	21.17 (14)	99173 (3)
Odisha	41974 (10)	13.97 (15)	269 (13)	61.5 (9.5)	978 (5)	16.69 (16)	39.98 (2)	48370 (14)
Punjab	27743 (14)	13.73 (16)	550 (6)	63.9 (3.5)	895 (17)	37.48 (6)	31.94 (5)	85577 (9)
Rajasthan	68548 (7)	21.44 (5)	201 (15)	57.6 (16)	928 (13)	24.87 (12)	31.31 (6)	57192 (11)
Tamil Nadu	72147 (6)	15.6 (14)	555 (5)	65.9 (1)	996 (2)	48.40 (1)	21.63 (11)	92984 (5)
Uttar Pradesh	199812 (1)	20.09 (7)	828 (3)	55.7 (18)	963 (8)	22.27 (15)	21.27 (13)	32002 (18)
Uttarakhand	10086 (18)	19.17 (9.5)	189 (16.5)	59.8 (13)	912 (16)	30.23 (9)	21.66 (10)	100305 (2)

Note: Figures in parentheses ( ) shows rank
Source: (1) Census of India, 2011, (2) Economic Survey 2011-12

6   Economic Implications of Demographic Change

(a)   Correlation Coefficient

In order to justify the relationship of economic growth with demographic variables, correlates of economic growth are obtained in table 6 for the year 2001 and 2011. The correlation coefficient of urban population and percentage of population in the working age group (15-59 years) are found to be positively and significantly correlated with PCNSDP for both the years. Though, negative sign of correlation coefficient of sex ratio in 2001 turned positive in 2011, but it remained insignificant in both the years. Social backwardness though negative, is also not showing any significant relationship with economic growth. It appears that sex ratio and social backwardness are not strong enough to show significant movement with economic growth. From the rank correlation coefficient, it is evident that the states, which have higher share of urban population and high percentage of population in the working age group, also have high economic growth and vice versa.

Table 6
Relationship between Demographic Change and Economic Growth
(Correlation and Rank Correlation Coefficients)

Variables	Correlation Coefficient		Rank Correlation Coefficient	
	2001	2011	2001	2011
Sex Ratio	-.121	.063	-.091	-.025
Urban Population	.556*	.703**	.623**	.688**
Percentage of Population in Working Age Group (15 -59 years)	.669**	.789**	.681**	.674**
Social Backwardness	-.285	-.318	-.225	-.161

*Note: * and ** shows 5% and 1% level of significant respectively*
Source: Author's calculation

(b)   Regression Results

Further, to find the causal relationship between economic growth and demographic change, the regression results are reported in table 7. The urbanization is found to have positive impact on per capita net state domestic product significant at 10 percent level. In the urban areas, the economic activities are more developed as compared to rural area. The economic activities are basically the non-agricultural activities, which is not influenced by climatic change. As a result, their contribution to domestic product is also high. In essence, higher the degree of urbanization, higher is the contribution to economic growth .The regression result shows that a one unit increase in rate of urbanization increases economic growth by 486.29 units. The

percentage of population in the working age group is found to have a positive and significant impact on per capita net state domestic product at 1 percent level. The population in the working age group of 15-59 years is considered to be productive as compared to dependent population (in the age below 0-14 years and above 60 years). The productive population have high propensity to save and invest as compared to population in other age groups. With the increase in percentage of population in working age group, the economic growth increases. The result show that when population in the working age group increases by one unit, economic growth increases by 2793.88 units. The time dummy is found to have a positive and significant impact on PCNSDP. This indicates that economic growth increases with time. However, the density of population, sex ratio and social backwardness are found to have a negative but insignificant impact on per capita net state domestic product. The explanatory variables together show 84 percent variation in the dependent variable. F-Ratio shows that the model is significant.

Table 7
Regression Results
Dependent Variable: PCNSDP

Explanatory Variables	B Coefficients
Constant	-75344.310
Density of Population	-6.572
Sex Ratio	-75.015
Urbanization	486.29*
Percentage of Population in Working Age Group (15- 59 years)	2793.886***
Social Backwardness	-358.398
Time Dummy	43283.880***
R^2	.842
F Ratio	27.530
N	38

*Note: ***, ** and * represents 1%, 5% and 10% significance level respectively*
Source: Author's calculation

7. Conclusion

As a whole, the study finds that the demographic scenario of India has changed in terms of age structure, sex ratio, rural-urban distribution of population and social class wise distribution of population. The study finds that the proportion of population in the working age group is high as compared to dependent population. The increasing trend of the working age population till 2031 and its share above 60 percent till 2091 indicates that India has the potential to reap the demographic dividend for a longer duration. This is confirmed from the significant impact of percentage of population in the working age group on economic growth.

The significant impact of urbanization on economic growth indicates the importance of all the social and economic factors for attainting a higher level of growth. Urban areas are comparatively more developed in terms of education, health, communication and telecommunication facilities, basic amenities (like electricity and water supply), as well as availability of economic opportunities to enable people to have a better standard of living. This implies a healthy human being equipped with knowledge and skill contributes to the nation's economy.

To conclude, a country can increase its economic gains from the increasing share of working age population provided that it should focus on the quality of its potential human resources by providing the appropriate facilities to convert them into a productive human being.

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ANNEXURES
A1: Determinants of Demographics Trends of India

Year	Crude Birth Rate (In %)	Crude Death Rate (In %)	TFR (children per woman) (In %)	Infant Mortality Rate (In %)	Child Mortality Rate (In %)	Net Migration Rate (In %)	Life Expectancy at Birth (In Years)
1950 – 1955	43.6	26.8	5.90	186	279	-0.1	36.62
1955 – 1960	42.6	23.8	5.90	170	255	-0.1	39.65
1960 – 1965	41.5	21.1	5.89	157	236	0.0	42.73
1965 – 1970	39.8	18.5	5.72	147	220	-0.1	46.02
1970 – 1975	38.4	16.1	5.41	136	202	0.7	49.39
1975 – 1980	36.6	14.0	4.97	121	178	0.4	52.54
1980 – 1985	35.5	12.7	4.68	106	153	0.2	54.93
1985 – 1990	33.0	11.6	4.27	93	133	0.0	56.73
1990 – 1995	30.0	10.2	3.83	82	116	-0.1	59.18
1995 – 2000	27.6	9.1	3.48	71	98	-0.1	61.57
2000 – 2005	25.3	8.4	3.14	60	81	-0.4	63.54
2005 – 2010	22.9	7.8	2.80	50	65	-0.5	65.57
2010 – 2015	20.0	7.3	2.44	41	52	-0.4	67.57

Source: Department of Economic & Social Affairs, Population Division,
World Population Prospects (2017 Revision), United Nations.

A2: Crime against Female in India

Year	Female Feticide	Female Infanticide	Dowry Suicide	Divorce Suicide	Dowry Deaths
2000	86	104	2411	169	6995
2001	55	133	2370	195	6851
2002	84	115	2378	-	6822
2003	57	103	2347	215	6208
2004	86	102	2585	242	7026
2005	86	108	2305	216	6787
2006	125	126	2276	226	7618
2007	96	134	3110	205	8093
2008	73	140	2981	255	8172
2009	123	63	2847	179	8383
2010	111	100	3013	177	8391
2011	132	63	3100	211	8618
2012	210	81	1894	151	8233
2013	221	82	2202	203	8083
2014	107	121	2222	183	8455
2015	97	91	1801	199	7634

Source: (1) Crime Report Bureau in India, various report since 1994, (2) Ministry of Health and Family Welfare, Govt. of India. (10443) & Lok Sabha Unstarred Question No. 1767, dated on 23.03.2012

A3: Sex Wise Infant Mortality Rate and Child Mortality Rate in India

Year	Infant Mortality Rate (Per 1000 live births)		Year	Child Mortality Rate (Per 1000 live births)	
	Male	Female		Male	Female
1981	110	111	-	-	-
1985	96	98	2008	64	73
1991	81	80	2009	60	69
1995	73	76	2011	51	59
2001	64	68	2012	49	56
2005	56	61	2013	47	53
2011	43	46	2014	42	49
2015	35	39	2015	40	45
2016	33	36	2016	37	41

Source: Sample Registration System (SRS) Bulletin various issues, Registrar General of India, Ministry of Home Affairs, Government of India.

A4:Life Expectancy in India (in years)

Year	Male	Female
1901-11	22.6	23.3
1911-21	19.4	20.9
1921-31	26.9	26.6
1931-41	32.1	31.4
1941-51	32.4	31.7
1951-61	41.9	40.6
1961-71	46.4	44.7
1970-75	50.5	49.0
1976-80	52.5	52.1
1981-85	55.4	55.7
1986-90	57.7	58.1
1991-96	60.6	61.7
1996-01	62.3	65.3
2001-05	63.8	66.1
2006-10	65.8	68.1
2011-15	67.3	69.6

Source: (1) Office of the Registrar General of India, Ministry of Home Affairs, GOI
(2) Report of the Technical Group on Population Projection May 2006, National Commission on Ministry of Health and Family Welfare, GOI

Impact of Monetary Policy on Financial Stability

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Abstract

Over the last two and a half decade since the introduction of deregulation and globalization, there has been a greater integration not only between financial and real market in the Indian economy but also at global level in form of inflow and outflow of cash. And financial stability has received much attention. Financial stability can be addressed either by monetary policy tools by the monetary authority or by the macro-prudential instruments by financial authority. Over the last few decades it has been a matter of great debate as to whom should control financial stability. The present paper is a contribution towards the theory. The paper uses six SVAR model on the basis of the empirical finding it can be concluded that macro-prudential measures can better address the financial stability but only for shorter durations as compare to the monetary policy instruments.

SECTION-I

Introduction

Over the last two and a half decade since the introduction of deregulation and globalization, there has been a greater integration not only between financial and real market in the Indian economy but also at global level in form of inflow and outflow of cash. This leads to the development of financial system. Financial system will be sound only when financial stability is maintained. Although there is no unique definition of financial stability. Different economists tries to define it in form of its role and function as " financial stability can be achieve with a goal of strong, sound and stable institutions, effective financial markets and efficient pricing perspectives".

Financial stability means that financial system can fulfill its three main functions:-

❖ Transforming savings i.e. mobilize savings for productive purpose
❖ Allowing risk management
❖ Sufficient resilience to disturbance arising from unanticipated shocks

Any imbalance in the financial system will pose great threat to the economic environment in form of credit of credit or liquidity expansion (asset price boom). It will further spur unanticipated inflation and hence adversely affect price stability and economic growth. Maintaining financial stability is fruitful not only for the efficient working of the financial system but also in maintaining price stability by making the transmission

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mechanism process effective.

Financial stability and Price stability both are complementary to each other i.e financial stability affects price stability through interest rate and lending by banks. For example caps on loan to value adversely affect household borrowings and their demand. Thus it indirectly affects inflation and price stability. Similarly, monetary policy affect credit, assets pricing, capital adequacy via change in interest rate and other non policy tools shows high degree of interaction between price stability and financial stability. It arise a question as whether monetary policy should pursue a goal of financial stability along with price stability or not. This led to the introduction of Macro prudential approach to address the procyclicality of financial system. Macro prudential approach also involves cost in form of loss in GDP and inflation due to high capital and liquidity requirement in form of reserves. Therefore, it arise a legitimate question as to which instrument be use for controlling the financial stability i.e. whether Monetary policy or Macro-prudential approach. The study covers all these aspects.

Rest of the paper is organized as follows- Section II will be the review of the earlier studies based on pros and cons of adopting Monetary policy and Macro prudential approach for addressing the financial stability . Section III focus on methodology and estimation using SVAR Model from 1991 to 2017. Section IV presents suggestions for strengthing the financial system.

SECTION -II

Review of Literature

The literature on the relationship of financial stability with monetary policy and price stability is divided as to whether there is tradeoff between them. And whether monetary policy alone is enough for maintaining financial stability and role of macro-prudential factors in maintaining the financial stability. There are three different views in this connection.

The first view argues on price stability and financial stability should be treated differently and control by different authorities i.e. macro prudential policy should pursue the financial stability task and price stability be under the supervision of central bank. It is based on "Jackson Hole consensus". Collard, Dellas, Diba and Loisel(2012) support this view. Adrian et al,(2013) also argues that financial stability be monitored through Macro prudential authorities.

Second view argues that financial stability concerns should be a part of the secondary objectives in the monetary policy strategy. This view considers "Leaning against the wind" strategy as proposed by Borie and Lowe (2002), White (2006), Woodford (2012) and others.

The third view proposes a radical view suggesting that there is an interaction between financial stability and price stability so it is impossible to make a distinction. Rajan(2005) investigated the theoretically and empirically to link between the monetary policy and risk taking behavior of the banking system. Schwartz (1995) considers price stability as a both necessary and a sufficient condition for financial stability and states that price stability lead to low risk of interest rate mismatches and low inflation risk premium. These minimization of risks resulted from accurate prediction of the interest rates due to credibly maintained prices.

The proper risk pricing contribute to financial soundness.

Fahr et al (2010) argued that the relative stability of inflation did not come at the cost of large fluctuations in aggregate output, but, when the financial crisis hits, output volatility increase.

Some authors like Issing(2008); Padoa-Schioppa(2002); Mishkin(1996) believe that price stability can be necessary but not a sufficient condition for achieving financial stability. They argue that a high interest rate measure to control inflation, could negatively affect the balance sheets of both banks and firms and too lax a monetary policy can lead to inflation volatility and a very tight monetary policy can lead to disintermediation and hence financial instability. Driffil et.al.,(2005) provided a theoretical argument that central banks interest rate smoothing process might induce a moral hazard problem and promotes financial institutions to maintain riskier portfolios.

Granvile et. Al., (2009), Dovern et.al. 2010 have examined the relationship between financial and monetary stability and found that the level of stress in banking sector is strongly affected by monetary policy shocks.

Sarat dhal, purnendu kumar and jugnu ansari (2011) have provided an empirical assessment of linkages of financial stability with economic growth and inflation using CAMEL indicators envisaged under Basel principles

Cheang and choy(2010); Caraderelli et.al. (2008) Borio and Lowe(2002), Van den End(2006), Albulescu(2010), Gersl and Hermanek(2006), BIS(2001), Illing and Liu(2003) and (2006) Das et.al.,(2005), Balakrishnan,et.al.(2009), these studies have engaged in constructing aggregated and composite indices for gauging stability of banking and financial system as a whole in line with the macro-prudential framework envisaged under basel principles popularly known as camel indicators.

A sign of increased awareness of the macro prudential dimension is that the authorities have made a number of adjustments to the original proposals in order to address procyclicity concerns (BCBS (2001 and 2006b), Caruana(2005)).

Present paper is the contribution to the above arguments. Present paper will tries to compare the effectiveness of monetary policy and Macro prudential instruments in addressing the financial stability. Along with it, cost-benefit test of individual Macro prudential instrument will also be conducted by analyzing their impact on output, price and financial stability.

SECTION-III
Methodology and Estimation

It has been a great debate on whether financial stability should be included as a goal of monetary policy along with price stability or financial stability should be maintained through Macro-prudential instruments. The article develops models that speak to compare the effectiveness of monetary policy and macro-prudential measure in maintaining financial stability by taking the data from 1991 to 2017.

 Six different SVAR model have been developed to analyze the above argument-

SVAR Model I ascertain the impact of monetary policy on price stability through all three channels of transmission mechanism i.e. credit, interest and exchange rate change.

$$\begin{bmatrix} y \\ p \\ r \\ \mathbf{cr} \\ \mathbf{neer} \end{bmatrix} = [y, p, r\ cr, neer]$$

SVAR Model II tries to analyze the effectiveness of monetary policy if it pursue goal of financial stability along with price stability.

$$\begin{bmatrix} y \\ p \\ r \\ cr \\ neer \\ fs \end{bmatrix} = [y, p, r\ cr, neer, fs]$$

SVAR Model III IV and V, we try to retrieve the impact of macro-prudential measure related to credit, capital and liquidity respectively on financial stability. Along with it cost-benefit analysis associated with the GDP, price and financial stability of individual macro-prudential measure will also be done.

$$\begin{bmatrix} y \\ p \\ Fs \\ credit\ growth \end{bmatrix} = (y, p, fs, credit\ growth)$$

$$\begin{bmatrix} y \\ p \\ Fs \\ c \end{bmatrix} = (y, p, fs, cr)$$

$$
\begin{bmatrix} y \\ p \\ Fs \\ Lq \end{bmatrix} = (y\,,\,p\,,\,fs\,,\,Lq\,)
$$

Model IV tries to identify the combined effect of all the macro prudential variables on financial stability output and prices.

$$
\begin{bmatrix} Y \\ P \\ Cr \\ Lq \\ Fx \end{bmatrix} = [y,p,cr,lq,fx]
$$

Where, y= output (GDP at current prices), P= prices(WPI), r= rate of interest, neer=nominal effective exchange rate, fs= financial stability estimated by using CAMEL indicators, lq=liquidity ratio and cr = credit growth.

Estimation

We will firstly transform the non-stationary data into stationary by taking log first difference. While interest rate and exchange rate are only in log form whereas in liquidity ratio no change has been done.

The identification restriction imposed on the above SVAR model is stated as under:

Model -I

$$
\begin{bmatrix} y \\ p \\ R \\ CR \\ NEER \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ NA & 1 & 0 & 0 & 0 \\ NA & NA & 1 & NA & 0 \\ NA & NA & NA & 1 & NA \\ NA & NA & NA & NA & 1 \end{bmatrix} \begin{bmatrix} e^y \\ e^p \\ e_r \\ e^{cr} \\ e^{nr} \end{bmatrix}
$$

MODEL-II

$$
\begin{pmatrix} Y \\ P \\ R \\ CR \\ NEER \\ FS \end{pmatrix}
=
\begin{pmatrix}
1 & 0 & 0 & 0 & 0 & NA \\
NA & 1 & 0 & 0 & 0 & NA \\
NA & NA & 1 & NA & 0 & NA \\
NA & NA & NA & 1 & 0 & NA \\
NA & NA & NA & 0 & 1 & NA \\
NA & NA & NA & NA & NA & 1
\end{pmatrix}
\begin{pmatrix} e^y \\ e^p \\ e^r \\ e^{cr} \\ e^{nr} \\ e^{fs} \end{pmatrix}
$$

Model-III

$$
\begin{pmatrix} Y \\ P \\ FS \\ CR \end{pmatrix}
=
\begin{pmatrix}
1 & 0 & 0 & NA \\
0 & 1 & 0 & NA \\
0 & 0 & 1 & NA \\
NA & NA & NA & 1
\end{pmatrix}
\begin{pmatrix} e^y \\ e^p \\ e^{fs} \\ e^{cr} \end{pmatrix}
$$

Model-IV

$$
\begin{pmatrix} Y \\ P \\ FS \\ NET\ FORIEGN\ EXCHANGE \end{pmatrix}
=
\begin{pmatrix}
1 & 0 & 0 & NA \\
0 & 1 & 0 & NA \\
0 & 0 & 1 & NA \\
NA & NA & NA & 1
\end{pmatrix}
\begin{pmatrix} e^y \\ e^p \\ e^{fs} \\ e^{fx} \end{pmatrix}
$$

Model-V

$$
\begin{bmatrix}
Y \\
P \\
FS \\
LIQ
\end{bmatrix}
=
\begin{bmatrix}
1 & 0 & 0 & NA \\
0 & 1 & 0 & NA \\
0 & 0 & 1 & NA \\
NA & NA & NA & 1
\end{bmatrix}
\begin{bmatrix}
e^y \\
e^p \\
e^{fs} \\
e^{lq}
\end{bmatrix}
$$

MODEL-VI

$$
\begin{bmatrix}
Y \\
P \\
FS \\
CR \\
LIQ \\
FORGIEN\ EX
\end{bmatrix}
=
\begin{bmatrix}
1 & 0 & 0 & 0 & 0 & 0 \\
0 & 1 & 0 & 0 & 0 & 0 \\
NA & NA & 1 & NA & NA & NA \\
NA & NA & NA & 1 & NA & NA \\
NA & NA & NA & NA & 1 & 0 \\
NA & NA & NA & NA & NA & 1
\end{bmatrix}
\begin{bmatrix}
e^y \\
e^p \\
e^{fs} \\
e^{cr} \\
e^{lq} \\
e^{fx}
\end{bmatrix}
$$

Empirical Findings:-

Model - I

Model I represents the effectiveness of monetary policy instruments on Real variables i.e. GDP and Price. Any shock in policy variables interest and credit has similar impact on GDP but works in opposite directions i.e., any shock in interest rate leads to increase in GDP where credit channel, any shock in it leads to decline in GDP. A positive shock to interest rate leads to decline in credit growth from period one and persist for longer period. Whereas, NEER has similar impact as the credit channel, however its effectiveness is lower as compare to credit channel. Similarly, in case of any response to price due to any shock on policy variable it seems that similar impact of these policy variables but the impact on price occurs with a lag after the impact on growth. Result also shows the GDP growth & inflation are statistically significant for number of periods. It is however, important to note that exchange rate channel of monetary policy transmission to GDP growth is

weak but its impact by way of inflation is significant leads to depreciation of currency which further improves net export & ultimately the impact on inflation. Thus, to conclude we can say that credit channel works efficiently on GDP followed by interest rate and NEER and is most important channel for monetary policy transmission.

Model - II

Model - II shows impact of financial stability on macro indicators. All macro variable and policy variable affects GDP and price over long time.

1.   Financial stability have significant and positive impact on GDP and prices and this impact raises over a passes of time but its relative impact on GDP is, about 3 times more as compare to its impact on price .

2.   Impact of price on financial stability to show interaction between price and financial stability.

3.   Impact of exchange rate (NEER) on financial stability is relatively high as compared to any other tools due to introducing financial stability. It seems impact of NEER on GDP became more as compared to its impact on price (reversal of model trend in model -I) i.e., there is lag impact 1st on GDP and gone price. It also suggests that the role of exchange rate became prime in maintaining financial stability. Further, it also reveals that impact of financial stability on price is less as compare to impact of price on financial stability i.e. price stability affects financial stability relatively high. Any instability in price lead to financial instability and it sustain for longer period. Thus, price stability is prerequisite for financial stability.

Model - III, Model - IV and Model - V, pertaining to operating the macro- prudential indicators credit growth; liquidity ratio and net foreign exchange assets separately i.e., use of single macro prudential indicator are blocked, in order to identify the response of individual indicator on GDP, price and financial stability. It also enables us to works on cost- benefit analysis of each macro prudential   indicators.

Net foreign exchange assets significantly affect GDP for longer period.   Similar impact can be seen for financial stability with comparatively lesser magnitude while for prices, its response is positive for short period (3 periods).

The behavior of credit on GDP and financial stability is modest with down ward trend. However, its impact on financial stability is for shorter period (4 periods). Credit shows negative impact on price for longer period.

Liquidity ratio has deterrent effect on financial stability and GDP with relatively higher impact on financial stability as compare to GDP. While it has lag effect on price up to 2 periods and thereafter its helpful in combating inflation with low magnitude. It also shows cost-benefit analysis of these macro-prudential indicators viz- credit, liquidity ratio and net foreign exchange assets. It can be also being seen   that credit significantly affects GNP and financial stability. Also its impact on inflation is also mild. That overall impact of credit is significant. On other hand the overall effect of change in liquidity ratio least effect the GDP, financial stability and price. Which suggest that if any financial authorities want to regulate financial stability for short period and not much impact is require than it can change liquidity ratio. However, the impact of any change in Net foreign exchange assets on GDP and price is more or less same with moderate effect on

maintaining financial stability. It shows that Net foreign exchange tool for controlling financial stability should be kept as a last resort.

SVAR model 2 and SVAR Model 6 comparative analyze the effectiveness of monetary policy and macro prudential policy in addressing the financial stability. On the basis of the model selection criteria if we compare the response of financial stability by the explanatory variables in both the model, it is found that value of R2 for model 6 is 0.69 while that for model 2 it is 0.055 further looking towards the other criteria i.e. AIC, SIC and Sum square residuals them their values are less for model 6. Thus it can be observe from the above analysis that model 6 fitted better as compare to model 2. i.e., macro-prudential polices can better work for resorting the financial stability. But at the same time it is also found that macro prudential indicators are having short term impact & less persistent as compare to the monetary policy tools.

SECTION IV

 Suggestions:-

Suggestions for strengthening the financial system

❖   Financial stability should be considered as one of the main aim of the economic policies just as price stability. A Financial system supervisory body be set up which works to maintain the financial stability.

❖   Target should be impose on crucial macro-prudential indicators which serves as a barometer of financial stability especially the CAMEL indicator, Loan to total value, Deposits to total income and

❖   Constant eye should be kept on these indicators and Early warning be given in case any deviation takes place and accordingly preventive measures should be taken immediately.

❖   Since there is an interaction between monetary policy tools and financial instrument so monetary policy and Financial system supervisory body be work under one roof.

❖   Up to the target level set by the authority, both the authorities can be work independently, take their own decisions but if financial instability level surpass the target then monetary policy and financial supervisory authority should work in a coordinated manner. A high level committee be also constituted consisting of experts from both bodies (Monetary and financial) in case if conflict arise due to overlapping of the tools.

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Jewellery and Gems: Export from India from 2007 To 2017

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Introduction

Ornaments have been a part of civilizations in India since ages. Jewellery has been an integral part of the Indian culture as they were in demand and in fashion since ancient civilization of Harappa and Mohenjo-Daro. As a well-known fact, jewellery can be adorned to highlight almost any part of the body. Gems and jewellery have been important part for both aesthetic as well as investment purposes. Masses in India have great fascination for gems and jewellery to the extent that it plays a significant role in the Indian economy. The industry is much fascinating being traditionally glamorous and artistically modern.

India is deemed to be the hub of the global jewellery market because of its low costs and availability of high-skilled labour. India is the world's largest cutting and polishing centre for diamonds, with the cutting and polishing industry being well supported by government policies. Moreover, India exports 75 per cent of the world's polished diamonds, as per statistics from the Gems and Jewellery Export Promotion Council (GJEPC). India's Gems and Jewellery sector has been contributing in a big way to the country's foreign exchange earnings (FEEs). The Government of India has viewed the sector as a thrust area for export promotion. The Indian government presently allows 100 per cent Foreign Direct Investment (FDI) in the sector through the automatic route. As an important sector of Indian economy, Gems and Jewellery is a leading foreign exchange earner for the country. Export of gems and jewellery has been among the fastest growing sectors in India in recent years. It has gained global popularity because of its talented craftsmen, its superior practices in cutting and polishing fine diamonds and its cost efficiencies. The gems and jewellery sector occupies a prominent place in the Indian economy in terms of export earnings, employment generation, and growth. 1 India has contributed about 80%of the global market in this sector in terms of carat. This leads to employing over 90% of the global diamond industry workforce, the country also accounts for about 90%of the volume of diamonds processed in the world. According to the recent reports, eleven out of twelve diamond tones set in jewellery are cut and polished in India. In this, processing is done on rough diamonds in a complete range of sizes and qualities, including the stones larger than ten carats.

The global market for Gems and Jewellery today is over $100 billion with jewellery manufacturing dominated by the countries like India, Italy, China, Thailand and USA. Gems and Jewellery industry is one of the significant contributors of the country's export-led growth. It is one of the fastest growing sectors accounting for around 15% of the India's total merchandise exports. The overall net exports of gems and

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jewellery stood at 35.6 bn US dollars during 2016-2017. India has established itself as the world's largest manufacturing sector for cut and polished diamonds. About 75% of the total cut polished diamonds are exported from India. India exported 16.55 billion US dollars of cut and polished diamonds in Apr-Nov 2018.

Review of Literature:

India Brand and Equity Foundation (IBEF), (2013) in the paper titled "Gems and Jewellery Industry in India" have examined that India has done wonders with respect to polishing and cut diamonds have become world class. Now our country and China are emerging as the leaders in the global jewellery industry in terms of consumption besides production and trade jointly would account for over 30% of global diamond market in 2015.

Economic Times, (2011) an article entitled "Gems and Jewellery rise 4% in April" has commented that India`s gems and jewellery exports rose marginally by 4.18% to 14,268 crores during April 2011. Exports of cut and polished diamonds have increased by 5%, while silver jewellery exports rose by around 34% during this period. The provisional export of gold medallions the same month stood at 4,543.31 crores, which shows decline of 0.72% over the comparative figure of 4,576.31 crore April 2010. "We have witnessed good business after recession and we hope that it will continue. We expect around 20% increases in exports this year".

Chanchala Jain, (2012) in the paper titled "International Journal of Engineering Sciences and Management A trend analysis of Export performance of Gems and Jewellery Industry in India" has discussed that this industry is an important emerging sector of Indian Economy. In this paper writer has used trend analysis technique collected through secondary data to give the performance of this industry for the years 2006-2011.

M. Soundarya P Retha, (2013) in the report entitled "Indian gems and jewellery industry export-oriented", in the paper THE HINDU has basically emphasized for those aspiring to get into gem-studded jewellery business, those already in the industry and even the buyers, learning more about diamonds other precious and semi-precious stones, the product made of these, and the designs will be popular now. This will be possible with the possible by the distance education courses planned by the Gemological Instituted of India, established by the Gems and Jewellery Export Promotion Council (GJEPC).

Prashant Rampuria, (2010) in a study named 'Competitive analysis of Indian Gems and Jewellery sector in US Market.' has basically emphasized to study structure, analyze India`s export of Gems and Jewellery sector for latest five years and to analyze the market share of India in US Market and to study Government Policy regarding export promotion.

Kaushik, Manu, (2009) in the article entitled "Gems not desired" has basically focused on the business performance of the gems and jewellery industry in India. The export earnings of the sector declined by 18.88 % according to the gems and Jewellery export promotion council in the second half of 2009. The cut and polish diamond segment is decreased by 18.24 % in 2007-08.

Das Keshab, (2007) in the paper titled "Informality and Double standards: The Globalized Indian Gems and Jewellery Industry." has summarized that participation in the global production network (GPNs) because of the efficient strategy has lead the Indian gems and jewellery industry is deeply linked in global market as it not only dominates the diamond processing trade but also major domestic consumer of gold and silver. Besides employing 1.5 million people it acts as a major foreign exchange earner. The informal nature of the production and labour process, thus cares, least of labour, environmental and social standards.

Objectives of the Study :
❖ To study the export figures of gems and jewellery during the period from 2007-08 to 2016-17.
❖ To study the major export destinations of Indian gems and jewellery.

Research Methodology :
The study is based on secondary data. The required data are collected from articles, newspapers, journals and websites mainly.

Empirics of the Study :
Export figures of gems and jewellery during the period from 2007-08 to 2016-17.

S.NO.	ITEMS	Value in US $ in million									
		2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
1	C&P DIAMONDS	14346	15156	19374	30574	26672	21607	24498	23160	20668	22784
2	COLOURED GEMSTONES	295	282	306	349	420	729	647	453	433	420
3	GOLD JEWELLERY	5687	8851	9755	7901	10029	13267	8367	9904	8557	8722
4	GOLD MEDALLIANS AND COINS	0	0	0	4939	6989	5235	3069	2837	5259	5409

5	PEARLS	4	4	4	5	4	6	10	2	1	5
6	SILVER JEWELLERY	232	241	420	574	774	934	1475	2052	2960	4021
7	SYNTHETIC STONES	1	1	1	17	25	52	80	79	73	135
8	COSTUME FASHION JEWELLERY	6	9	15	6	11	17	18	22	31	67
9	SALES TO FOREIGN TOURISTS	72	56	42	40	63	56	70	47	41	42
10	**TOTAL**	**20643**	**24599**	**29918**	**44404**	**44987**	**41903**	**38234**	**38556**	**38022**	**41605**

Source: www.giepc.org

Table 1
ANNOVA TABLE

SUMMARY Variance	Count	Sum	Average
C&P DIAMONDS 24183903	10	218839	21883.9
COLOURED GEMSTONES 22130.93	10	4334	433.4
GOLD JEWELLERY 3713934	10	91040	9104
GOLD MEDALLIANS AND COINS 6800916	10	33737	3373.7
PEARLS 5.833333	10	45	4.5
SILVER JEWELLARY 1631459	10	13683	1368.3
SYNTHETIC STONES 2031.822	10	464	46.4
COSTUME FASHION JEWELLARY 329.5111	10	202	20.2
SALES TO FOREIGN TOURISTS 150.9889	10	529	529.9

YEAR	COUNT	SUM	MEAN	VARIENCE
2008	9	20643	2293.667	23868451
2009	9	24600	2733.333	30118172
2010	9	29917	3324.111	46417064
2011	9	44405	4933.889	1E+08
2012	9	44987	4998.556	79591592
2013	9	41903	4655.889	59574402
2014	9	38234	4248.222	64969610
2015	9	38556	4284.00	60221792
2016	9	38023	4224.778	47045486
2017	9	41605	4622.778	56059987

ANOVA

Source of Variation	SS	Df	MS	F	P-value	F crit
Rows	4.29E+09	8	5.36E+08	150.437	8.85E-42	2.069832
Columns	70584775	9	7842753	2.20054	0.031649	2.012705
Error	2.57E+08	72	3564014			
Total	4.62E+09	89				

ANOVA tool is used to check whether there is any significant change in export value of different items of Gems & Jewelleries between years from 2008-2017 and the hypothesis made is given below:

$H_1 0$= Statistically there is no significant change in export values of different items categorised under Gems & Jewelleries.

$H_1 1$=Statistically there is significant change in export values of different items categorised under Gems & Jewelleries.

$H_2 0$= Statistically there is no significant change in export values of Gems & Jewelleries in different years.

$H_2 1$=Statistically there is significant change in export values of Gems & Jewelleries in different years.

As we have analysed the given data by using ANOVA we get that in both rows and columns (Items and Years) F-critical is less than F calculated, therefore on both times Null hypothesis is rejected.

Hence there is significant change in export value as far as different items are concerned and also there is significant change in export values of Gem & Jewelleries in different years,that is the export of Gem & Jewelleries are changing in different financial years.

The table:1reveals that in the year 2007-08, the export of cut and polished diamonds is the highest i.e. US$14346 million, followed by gold jewellery export of US$5687. The item which is least exported in this year was synthetic stones. In the year 2008-09 the highest export is of C&P Diamonds worth US$15156 million. The fluctuation in the export figure is not much. Such fluctuations can be seen normally. In the year 2009-10 the total export of gems and jewellery stood at US$29918 million showing 21.62% increase as compared to the previous year. The cut and polished diamonds stood at US$19374 showing an increase of 27.83 per cent. In the year 2010-11 the total gems and jewellery export in this year has increased by US$14486 million. The cut and polished diamonds showed an increase of 57.80% as compared to the previous year, while gold jewellery exports declined by 19 per cent. In the year 2016-17out of India's total merchandise exports, around 15% accounted for gems and jewellery in the financial year 2011-12. The total export of gems and jewellery in this year accounted for US$44987. Perhaps, the cut and polished diamonds exports declined by 12.76%.in the year 2012-13 ended on a positive note with increase in export of gold jewellery by 33 per cent contributing significantly to India's foreign exchange earnings and supported balance of payments. Total gems and jewellery exports for this year was US$ 39137 million. The year 2013-14 declared a contribution of US$34991 million to India's foreign exchange earnings, with a decline of 11 per cent as compared to the last year figures. But it shows an increase of 12.65% in export of cut and polished diamonds. In the year 2014-15 gross exports of C&P Diamonds during 2014-15 stood at US$23160 million shows a decline of 5.46% compared to US$ 24498 million during 2013-14. Gold jewellery export at US$9904 million during 2014-15 shows a growth of 18.37% when compared to the previous year.

In the year 2015-16 cut and polished diamond segment, at US$20668 million accounted for 52.61% of the total gems and jewellery exports. Gold jewellery exports at US$8557 million stood second accounting for 21.78% of total exports. Gold medallion and coins exports at US$5258 million stood third accounting for 13.39% of total exports. In the year 2016-17 the gems and jewellery exports increased by 12.32 per cent during 2016-17, compared to previous year. The export of cut and polished diamonds went up by 12.76 per cent and the gold jewellery exports grew by 4.14 per cent.

Major destinations for India's Gems and Jewellery exports (2017-18)

Country name	Growth percent
Hong Kong	33 per cent
UAE	25 per cent
United States	23 per cent
Singapore	9 per cent
Belgium	8 per cent

The above table reveals that the major destination for India's 33 percent of Gems and Jewellers were exported to Hong Kong followed by UAE with 25 percent, United States with 23 percent, Singapore with 9 percent and Belgium with 8 percent.

Export value of Gems and jewellery from the major export destinations from the year 2004-2005 to 2016-17

Financial year	Export value ($bn)	Growth rate
2004-05	15.66	-
2005-06	16.70	6.64
2006-07	17.16	0.0003
2007-08	20.92	21.91
2008-09	24.89	18.97
2009-10	29.44	18.28
2010-11	43.05	46.33
2011-12	43.21	0.37
2012-13	39.14	-9.41
2013-14	34.99	-10.6
2014-15	36.22	3.51
2015-16	32.63	-9.91
2016-17	35.55	8.94
2017-18	43.80	23.20
2018-19	45.77	4.49

Source: Gems and Jewellery Export Promotion Council (GJEPC)

The table is analysed by Forecasting. By forecasting we will see the future export value of Gems and jewellery.

The table reveals that there is fluctuating trend in the export value of gems and jewellery from the financial year 2004-05 to 201-17. The highest export value is in the year 2011-12 i.e 43.21bn but the growth rate is low as compared to the previous year i.e 46.33. The lowest export value is seen in the year 2004-05 i.e 15.6 bn. The average export value of all the years is 29.96 bn.

Hypothesis :

H0: Statistically there no is significant change in the export value of Gems and Jewelleries from (2004-05 to 2016-2017)

H1: Statistically there significant change in the export value of Gems and Jewelleries from (2004-05 to 2016-17)

ANOVA

Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	25509218	1	25509218	447562	9.11E-53	4.259677
Within Groups	1367.903	24	56.99594			
Total	25510586	25				

In the above table the P value (9.11) which is higher than 0.05 which indicates that there is no significant change of exports between the years. Therefore our null hypothesis is accepted.

Suggestions for improving the export value of Indian Gems and Jewellery are:

1.   It is necessary to establish design development centers to bring new futuristic designs in order to compete internationally.

2.   Government should take initiatives to provide sufficient credit to this industry for promoting the exports and helping in the development of the economy.

3.   The price should be stagnant so that there may be no change in buying pattern of consumers.

4.   To improve the export of Gems and Jewellery products government should take initiatives to maximize the export of imported raw material.

5.   Government should offer attractive labor union terms and export-friendly policies.

6.   Improving technology in the gems and jewellery market, so, that they may compete with other countries.

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Impact of Visual Merchandising on Impulsive Buying Behavior: An Empirical Study

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Abstract

Visual merchandising has been attracting retailer's attention since the eighteenth century. It increases the desirability of the product in the customers' mind. The arrangement of merchandise is often considered as the most critical factor for the store to attract the customer. A humble effort has been made to find out the impact of visual merchandising factors of the window display, mannequin display, promotional signage and store layout on customers impulsive buying behavior.

For measuring the impact 300 respondents have been selected through convenient sampling method. A set of questions given to customers' and their responses were recorded through a five-point Likert scale. The outcomes of the study reflect that window display, mannequin display and promotional signage have a positive impact on impulsive buying behavior. It has been found statistically significant. The study suggests that decoration of the window display and mannequin display are essential factors to entice customers. The promotional signage also plays a vital role in boosting customers' impulsive buying behavior. Therefore retailer should focus on the visual merchandising tools to enhance impulsive buying behavior.

Keywords : Promotional signage, store layout, window display, mannequin display, visual merchandising

Introduction :

The consumers show versatile purchasing behavior to the products, so the retailers appreciate visual merchandise and consider it as an essential tool to attract the customers and make their business well-being. The marketers and the retailers are continuously cramming, how they can create an excellent environment in the store to magnetize the customers and make their shopping procedure easy and exciting. The manipulation and the usage of eye-catching exhibits and store layout plans are used to connect the customers with the merchandise and enhance the stores' sales bustle. In visual merchandising, the products are typically exhibited in a way that it can draw the consumers' attention towards the best features of the products and pull out the customers from the projected market. The visual merchandising strategy can generate a brand identity.

Visual merchandise deals with the appearance of a store and its commodities in such comportment that it will

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attract the attention of the prospective customers. It engrosses in embellishing the store's interior appearance as well as outside presentation. Various authors projected different kinds of definitions on visual merchandising. Walters & White (1987) delineate visual merchandise as the activity that coordinates merchandise selection with an effective merchandise display. According to Bastow-Shoop et al (1991), visual merchandising is depicted as everything the customer observes both in the exterior and in the interior that creates a positive image of a business and results in attention, interest, desire, and action on the part of the customer.

Diamond and Diamond (2003) portrays visual merchandise as the presentation of a store and its merchandise, in a way that aims to attract the attention of potential customers and motivates them to make purchases.

Ebster and Garus (2011) illustrate visual merchandising as the art and science of presenting products in the most appealing way. The merchandising display in a pleasant and fashionable way attracts the consumers and converts the window shoppers into prospect and actual buyers. Currently the visual merchandising has become a natural component for a retail store and plays a role of direct communicator between the customer and the merchandise. Visual merchandising approaches the merchandise physically, visually, rationally and psychologically towards the customers without the help of a salesperson. It works as a 'silent seller'. It effects easily in the consumers' mind and converts the customers into buyers. In the modern era, visual merchandise acts as an indispensable communicator on behalf of the marketers and the retailers.

Review of Literature

"Visual merchandising" is everything that the customers observe in both the exterior and the interior that creates a positive image of the business and results in attention, interest, desire, and action on the part of the customers (Passewitz, et al 1991). Mills, et al, (1995), Diamond and Diamond, (2007) defines visual merchandising as "The presentation of a store/brand and its merchandise in a manner that will attract the customers and motivate them to purchase through the teamwork of the store's advertising, display, special events, fashion coordination, and merchandising departments in 11 order to sell the goods and services offered by the store/company". Visual merchandising is very important in retailing because, about 60% to 75% of the information regarding the atmospheric decor is gained at the very first sight of the store merchandise (Tullman & Clark, 2004, Passewitz, et al, 1991). Underhill (2009) in his research conveys that visual merchandising or visual display is a way to communicate between the retailer and the consumer by an effective, eye-catching presentation of the store that instantly creates an impact on the mind of the consumer to make further purchase with a positive attitude towards the store and its display."The purpose of visual merchandising is to educate the customer, to enhance the store/company's image, and to encourage multiple sales by showing apparel together with accessories" (Frings, 1999).

Window Display

Dawes (2008) in his article discussed very well that 'Window Display' is one of the most efficient contrivances

to grab the consumers' attention. He states window display portrays brand and business on behalf of the retailers. According to him display tools, not only attract the customers' mind but also, promotes the products displayed alongside. So window display is rather called a selling device that should be utilized skillfully. Ingenious displays are more enthralling to the consumers and to execute this kind of display, skill-full merchandise is required. The research provides some crucial guideline to do justice to the above task. The study emphasizes a lot on the simplicity of walls, floors, and fixtures. It is scrutinized that a simple and unconventional presentation is much more accomplished for its budget management and for an eye soothing demonstration. The study draws up a culmination by emphasizing the simplicity of the merchandising display to sustain a good brand image (Bustos, 2004). Madhavi, S., Leelavati T.S (2013) in their research exhibited the offshoot of an early inquisition on visual merchandising and its impact on impulse buying behavior. Their study converged on visual merchandising with a special precedence on the magnetism of the window display that creates an enticing charm over the consumers' mind and makes them an impulse buyer. The themes that work as active stimuli are merchandise colors, presentation style, awareness of fixtures, path finding, sensory qualities of materials and lighting. The study provides ample demonstration that will help the retailers to utilize visual merchandising in increasing the allurement of the products in the retail store and also to guide the customers to be aware of the products as well as to create a favorable attitude towards the store.

Mannequin

Mannequin helps to conduct positive response and approval as one can see the design and entire outfit and also can comprehend how the apparel will look like on him/her. Hence, the mannequin industry also plays a major role in visual merchandising (Clark, 2007). Clark (2007) discussed in his research study about the precedence of the mannequin in visual or retail merchandising. Time to time it has undergone drastic changes with the mannequins being realistic before, then abstract, later headless and now switching back to the realistic concept, associated with the human touch. Vinamra Jain, Ashok Sharma & Pradeep Narwal (2012), in their paper, explore that the decision-making behavior of women buyers, especially in apparel shopping, mostly depends on the window display and the mannequins. Their survey administered that apparel displayed on mannequins inside the store and in show-windows has a significant impact on the purchase decision of women.

Store Layout

Store layout provides the space through which the consumers can walk in the store comfortably. It includes selling space, storage space, personal space and the customer's space. A well-organized and spacious store layout insists the customers in browsing the store for a longer time and purchase those products also which they do not purchase frequently (Levy & Weitz, 2012). "Store layout refers to the ways that the store uses its space to facilitate and promote sales and serve customers" (Schneider, et al, 2009). It influences the flow of traffic in a certain corner of the store. A well-designed store layout is the base of the internal traffic patterns

and operational efficiency of the store (Lewison, 1994). Consumers' satisfaction level is mostly dependent on the design of the store layout (Cil, 2012), it can create and alter the demands and the preferences of a consumer (Simson, 1999). But most importantly, an efficient store layout contributes to both the product's sales and store's profitability (Cil, 2012). A study conducted by Vrechopoulos, O'Keefe, Doukidis, and Siomkos (2004) focus on how store layout plays a detrimental role in sustaining the store image. A good store layout renders an opportunity for a good increase in sale.

Promotional Signage

Promotional Signage is cost effective and an efficient tool to pass on the message of the retailers to the customers (Iqbal et al, 2011). It helps the customers to locate the specific product in the store and gives information related to it.

In-store environmental cues focus on the "communication" between the elements and the stimulus that the consumer digests through a number of sensory modalities. The whole point of visual merchandising is to help companies to communicate the brand message with the customers so that they can make better-informed choices. Amandeep Kaur, (2013) proved that there is a relationship between customers' buying behavior and promotional signage. His research concludes that visual merchandising has a close affinity with the sales performance

Objective

An effort has been made to investigate the relationship between the customers' impulsive buying behavior and visual merchandising strategies like- the window display, mannequin display, promotional signage and layout of the store.

The paper is organized as follows -Section 1 deals with an introduction, Section 2 presents Review of literature, Section 3 discusses adopted research methods, section 4 provides Empirics followed by conclusion and policy implications in section 5.

Research Methodology

The study had been conducted in Indore city. From the city 300 customers were selected by the convenient sampling method. The selected customers were given a set of questionnaire containing eighteen questions related to selected variables of visual merchandising. They were asked to respond on the basis of Likert Scale - 5 points for strongly agree (SA), 4- points for agree (A),3 for neutral (N),2 for disagree(D) and 1 for strongly disagree(SD).

Research Hypothesis

H0: Window display does not influence the customers' tendency of buying behavior.

H1: Window display influences the customers' impulsive buying behavior.

H0: Mannequin display does not influence the customers' impulsive buying behavior.

H1: Mannequin display influences the customers' tendency impulsive buying behavior.

H0: Promotional Signage does not influence the customers' impulsive buying behavior.

H1: Promotional Signage influences the customers' impulsive buying behavior.

H0: Store layout does not influence the customers' impulse buying behavior.

H1: Store layout influences the customers' impulse buying behavior.

Research Tools

$$Y_{IMP} = \beta_0 + \beta_1 X_{(WD)} + \beta_2 X_{(MD)} + \beta_3 X_{(PS)} + \beta_4 X_{(SL)} + \mu_i$$

Where,

Y_{IMP} = No of visit for shopping in the market/week

β_0 = Intercept.

$\beta_1...........\beta_4$ = Coefficient of variables.

$X_{(WD)}$ = Window display

$X_{(MD)}$ = Mannequin display

$X_{(PS)}$ = Promotional Signage

$X_{(SL)}$ = Store layout

μ_i = Error Term

Empirics

On the basis of the customers reporting, the given information has been analyzed.

General Profile

A brief summary of customers' demographic profile is given below-

Table No. - 1
Demographics Descriptive Statistics

PARTICULARS		FREQUENCY	FREQUENCY%
GENDER	MALE	128	42.67
	FEMALE	172	57.33
	TOTAL	300	100.00
AGE	20-25	89	29.67
	25-30	109	36.33
	30+	102	34.00
	TOTAL	300	100.00
OCCUPATION	SALARIED	207	69.00
	BUSINESS	93	31.00
	TOTAL	300	100.00

INCOME	20000-30000	100	33.33
	30000-40000	136	45.33
	40000-50000	45	15.00
	50000 & above	19	6.33
	TOTAL	300	100.00
EDUCATION	UNDERGRATUATE	67	22.33
	GRADUATE	120	40.00
	POST GRATUATE	113	37.67
	TOTAL	300	100.00
MARITAL STATUS	MARRIED	157	52.33
	UNMARRIED	143	47.67
	TOTAL	300	100.00

According to the above table, 57 percent customers are female and 43 percent customers are male. 36 percent customers are in the age group of 25-30, 30 percent customers are in the age group of 20-25 and 34 percent customers are in the age group of 30+. 69 percent customers are salaried and 31 percent customers are business holders. Most of the customers(45%) having income 30000-40000, 33 percent customers are in between 20000-30000 income group. 15 percent customers are in between the income group of 40000-50000 and the rest of the customer's income is above 50 thousand. Education wise 22 percent customers are under-graduate, 40 percent customers are graduates and 38 percent customers are postgraduate. 52 percent customers are married and 48 percent customers are unmarried.

Assessment of Relationship between Customers' Impulsive Buying Behaviour and Visual Merchandise Strategies

Now to investigate the relationship between customers' impulsive buying behavior and visual merchandise strategies like the window display, mannequin display, promotional signage, and store layout the regression has been run and the following result has been derived from reported facts/information.

$$Y_{IMP} = \beta_0 + \beta_1 X_{(WD)} + \beta_2 X_{(MD)} + \beta X_{(PS)} + \beta_4 X_{(SL)} + \mu_i$$

Thus

$$Y_{IMP} = 1.69 + 0.13X_{WD} + 0.19X_{MD} + 0.13X_{PS} + 0.10X_{SL}$$

t   (2.499*)   (3.589)**   (2.668)**   (1.742)

$R^2 = 0.73$ F=5.63

* Statistically significant at 5 % level.   ** Statistically significant at 1 % level

From above calculated result the following inferences can be drawn

Window Display

The window display is influencing customers' impulse buying behavior. Eye-catching and beautifully decorated window display attracts the customers. In the study, it has been found statistically significant at the 5 % level. It proves that window display is one of the most important factors that influence impulse buying behavior.

Mannequin Display

Customers like to purchase products after seeing it on mannequin display. Mannequin display is influencing customers' impulsive buying behavior. It has been found in the study that mannequin display is statistically significant at 1% level. Hence it can be inferred that mannequin display is a vital visual merchandising factor to attract the customers to make an impulsive buying.

Promotional Signage

Promotional signage is influencing customers' impulse buying behavior. The customers are tending to purchase products when they found promotional signage. In the study, it has been found statistically significant at 1 % level. Therefore, it can be said that promotional signage is one of the most important factors in enhancing impulse buying behavior.

Store Layout

Customers like to purchase products in a spacious and comfortable store layout. Store layout influences customers' impulse buying behavior. In the study, it has been observed statistically non-significant. It shows that store layout is not so important factor for customers' impulsive buying behavior.

The above model is statistically significant because F calculated value is higher than the table value. The total unexplained factor is 27% while 73% explained the variables taken into account for measuring the influence of impulsive buying behavior.

Conclusion and Policy Implication

Impulse buying is an unanticipated purchase or unplanned decision to buy a product or service made just before a purchase. The Window display and mannequin display decorated with innovative ideas or images related to our day to day life and the latest fashion trends attract customers. Mannequin generates an idea in the customers' mind about the products, how will they look when they wear it on - the imagination triggers in their mind and encourages them to purchase that product. When the passersby have noticed products in the window display, a curiosity augmented in their mind to know more about the products and they were unable to restrain themselves from entering the store. Eye-catching window display increases footfalls in the store and invokes them to make an impulse purchase.

Promotional signage's playing a vital role in boosting customers' impulsive buying behavior. The customers are inclined to purchase products when they found promotional signage like price discount, rebate, clearance sign etc. so, it can be said that when customers found promotional signage they are more tended to purchase discounted products without analyzing their actual needs. Signages should be placed in such a manner that they can be easily noticeable by the customers. Store layout is a noteworthy factor of the retail stores which contributes to the uniqueness of the stores. Convenient store layout helps the customers to browse the entire store and view a wide assortment of merchandise which can facilitate the sales and profitability. The spacious and comfortable layout is a leading concern for the customers' purchasing behavior so the retailers should prefer comfortable and spacious layout according to the nature of in-store products.

Therefore, the study suggested that retailers should emphasize on well decorated, innovative and eye-catching window display and mannequin display to invoke the customers to come into the store and make an impulsive purchase.

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Small Savings Schemes : Introduction, Trend and Pattern
(Post Reform 1991-2017)

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Abstract

This research paper intended to elaborate small savings schemes, trend and pattern after new economic reforms. General statistical methods would possibly used to show trend and pattern. It has been examined that small savings schemes sponsored by government is a very attractive avenue for small savers. Result shows that there is a high percentage of gross small savings to total household savings. Receipts in Small savings in these 26 years manifold more than 2400 times which shows faith of people in these schemes.

Keywords: Small savings, small savings schemes, Post Office Saving Banks (POSB), KVP, PPF, NSSF, IPPB.

Introduction

"Save for rainy days" is an old hearing which shows importance of saving but where to save? is also a very crucial question for not only individuals but also for the governments. Indians have habit to save but this saving cannot optimize till it should not be proper channelized. With the development of economical and financial institution problem of where to save is being resolving.

In India, saving schemes include a plethora of products that are intended for a wide segment of potential customers. The post office-run schemes sponsored by government of India are predominant as they are easy accessible to people in urban as well as rural areas. Despite the constant rate cuts and secure deposits, government-backed small savings schemes remain to be popular amongst all classes of people in India.

Various saving scheme were launched by central government under Government Savings Bank Act, 1873, Government Savings certificate Act, 1959 and Public Provident Fund act, 1968. The objective of the Small savings schemes is to encourage small savings, enhance social security and to mobilize resources. The small savings schemes has common characteristics like safe, guaranteed and comparatively high rate of interest, tax relaxation, capital protection and easy to liquidize that's why these schemes are very popular in Indian households. The investment in small saving schemes does not need any credit rating as they are government backed. Department of Posts (DoP) has the monopoly since a long to run these schemes but recently government given permission to some Banks to sold small savings schemes.

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Deposits under these schemes are managed by government of India under Public Account (art 266(2), constitution of India). National Small Saving Fund was established in 1999 within Public Account of India for pooling the money from different small savings schemes and to delink small savings transactions from consolidated fund of India. The money in this fund is used to finance fiscal deposits of state and central government and the balance in the fund is invested in government (centre & state) securities. The rate of interest on these saving schemes is decided by government of India which is revised quarterly and fixed on the basis of G-sec yields.

Recently Government of India proposed to merge the PPF Act and Saving Certificate Act with Government Saving Bank Act, 1873 without taking away any of existing benefit and with adding more benefits so that existing ambiguity due to multiple acts can be removed.

The small savings provides security not only to households but it also finance government and helps in reducing external debt. According to data from the Reserve Bank of India (RBI), small savings schemes such as post office deposits, National Savings Certificate (NSC), and Kisan Vikas Patras (KVP) accounted for a little over a fifth (20.9 per cent) of all central government borrowing in FY18. There has been a sharp rise in government borrowing from   small saving schemes in the past five years and the contribution of market borrowing was a 17-year low in 2017-18.

Objectives of the Paper

❖ To give general introduction of small savings schemes;

❖ To study trend and pattern of small savings in India after Reforms;

❖ To calculate annual growth of small savings;

❖ To calculate Percentage of gross small savings in total household savings.

Review of Literature

Many studies have been undertaken so far in this era of research a brief mention of these studies and their results would be disused in this section so that this paper would be more meaningful. Although there are essay like article available related to small savings but still there is lot of possibilities to be work done in this sector. Here are some studies:

Talukdar, Umesh(2003) in his exercise on the pattern of rural savings and its investment in the economic development of Assam(Nilbari District) and shown important role of small savings in strengthening rural economy .Joseph, M.A.(2004) has done his work on mobilization of saving through mutual funds and shown its important role into mobilize savings with merits and demerits of mutual funds. Further in 2015 Siby Joseph K and Joseph M.A has done their work on retail investors' perception (in Kerala) and summarized that

mostly small savers have positive approach towards investing in mutual funds.

R. Ganapathi and S. Anbu Malar (2010) Studied Investors Attitudes towards Post office Deposit Schemes to identify the awareness, preference and attitudes of investors towards various deposit schemes offered by the Post Office among 300 respondents of the Coimbatore District and found a positive attitude towards postal savings deposits. Vinayagamoorthy and K.Senthilkumar (2012) in their study "An analysis of Postal Investment and Small Savings", shown that mobilization of domestic financial resource has remained a major concern in many developing countries and small savings schemes proven an important role. Postal savings funds play a significant role in financing public debt. Dr. Dhiraj Jain, Ms.Ruhika Kothari (2012) also considered post office services as a backbone of rural economic development and K. Senthil Kumar (2014) in his study signify that investments made by the rural people may positively facilitate the nation to grow.

Dr. Ranjan Kshetrimayum (2014) attempted a study on small savings in Manipur From agents' prospective and shown that mobilizing small savings needs the role of agents as they explained the knowledge of small savings schemes (SSS) in rural India as well as in urban. Anjum Sayyad, Akbar Sayyed (2015), shown the Post office savings as a convenient, reliable, formal institutions which offering savings products to the people of the nation. After the globalization of economy facilitate the post office to march towards the internationalization. Indian POSB has a most reliable agency of Government of India due to its geographical accessibility and product differentiation.

Ms.S.Mathumitha(2015) and Kore Shashikant D, Dr. R.B. Teli,(2015) shown in their respective studies that as post offices provide safe convenience and liquidity hence it facilitate and attracts depositors. B.Saranya, G.B.Karthikeyan (2015) Analyzed attitude of savings in different form in India as there are multiple investment avenues available to meet different needs of the investors the rural savings will have a progressive impact on the growth of the economy. People have a positive attitude towards savings schemes available in post offices.

R.Vembu, J.Abinaya & K.Kirubhhaharan(2018) in their study on attitude of rural investors towards postal savings services shown that rural females and illiterate people tend to invest their huge amount in small savings due to easy availability of postal service. The study emphasize on the need to increase interest rate so that higher income group can also be attracted.

Source of Data and Methodology

Secondary database for this analysis has been taken from 1991-92 to 2016-17 (26 years). Small savings data published as occasional series in monthly Bulletin of RBI which are collected from Accountant General, Posts and Telegraph. These data are under three headings (1) Total Deposits which includes deposits of POSB, MNREG, National saving Scheme,1987 & 1992, Senior Citizen Scheme ,Post office Time Deposits, PORD and other deposits; (2) Total Certificates including National Saving Certificate (NSC) VIII issue, Indra

Vikas Patras, Kisan Vikas Patras, NSC VI, NSC VII and other certificates; (3) Public Provident Fund (PPF). Trends and patterns have been analyzed by using percentage method, tables and graphs. Here in this paper we have taken data as gross savings (only receipts).

Introduction of Small Savings Schemes

Small savings in budget section comes under department of economic affairs (DEA), Ministry of Finance. The major saving schemes are mentioned here in brief.

1)   Post office saving account (POAS)

Postal department have a wide network with more than 1.55 lakh post offices across India. It is very crucial to reach last mile not for communication but also for financial services. Knowing the potential of postal infrastructure post office saving bank was established in 1873. One can open account with a nominal opening amount i.e. Rs 20 with normal documents and KYC norms. The POSB account also has the facilities as normal account in commercial bank. Cheque book facilities, ATMs availability, ECS and easy accessibility made post offices very popular among common man. Government of India decided to use the huge potential of post offices in financial inclusion so India Post Payment Bank (IPPB) was established in Aug2016 and started to work as pilot project in Jan 2017. On September 2018 IPPB started to work in all district head quarter all over India which will be further expended to all postal branches with the motive of " Aapki Bank, Aapke Dwar".

2) Post-office recurring deposit (PORD)

The post-office recurring deposit (PORD) is a systematic savings plan (SSP), where one can save small but finite equal sums of money every month for a period of 5 years (60 months). As the savings in the PORD earn fixed interest and can be used to accumulate predetermined savings over time. One can prematurely close account after three years and made up to 50% withdrawal after one year. Its liquidity is offered in form of withdrawals subject to conditions and penalties and provides no tax benefit.

3) Post-Office Term Deposit (POTD)

The post-office term deposit (POTD) is similar to a bank fixed deposit, where one can save money for a definite time period, earning a guaranteed return through the tenure of the deposit. The scheme is backed by government hence capital in it is fully protected. The POTD is not inflation protected, which means whenever inflation is above the guaranteed interest rate, the return from the scheme earns no real returns. But whenever the inflation rate is below the guaranteed return, it does manage a positive real rate of return. The POTD is risk-free and liquid, means one can borrow against it and also withdraw prematurely. The POTD are in form

of 1yr, 2yrs, 3yrs and 5yrs among which 5yrs tenure is tax free.

4) Post Office Monthly Income Scheme (POMIS)

The Post Office Monthly Income Scheme (POMIS) was launched with the purpose to avail a fix assured monthly income having a guaranteed-return. Currently, one earns a 7.8 per cent interest per year on the deposit, which is paid every month hence the name 'monthly income scheme'. Although the scheme have not any tax incentive but still it is famous product among small savers as it is risk free and government backed. At present guaranteed interest rate on POMIS is 7.80% which will be notified every quarter but interest is applicable at the time of investment for the whole period. It is also a liquid investment as premature closing permitted with penalty.

5) Senior Citizens Savings Scheme (SCSS)

The senior citizen saving scheme was introduced in 2004 by central government for senior citizens to avail guaranteed returns. An assured quarterly return is paid which create a regular income flow. The capital in the SCSS is completely protected at present the rate has been set as 8.3 per cent compounded annually and paid quarterly. Although SSSC is liquid, despite of 5year lock-up period with conditions. There is penalty of 2% on deposits if closed prematurely. Tax deduction under 80C of the Income Tax Act is available for sum insured but the interest is taxable if above 10000 per year.

6) Public Provident Fund (PPF)

The Public Provident Fund (PPF) is a long-term savings instrument established in july1968 by the Central Government with objective providing old age income security to the unorganised sector and self employed people. It offers tax benefits on contributions, loan facility and withdrawals after the lock-in period. Guaranteed returns and tax benefit facility have fuelled its popularity. Although primary objective to invest in PPF is tax deduction as it has EEE facility but risk free capital protection with guaranteed returns attract people. EEE means deposits, interest earned and maturity amount are tax exempted. At present rate of PPF is 7.6% compounded annually which is revised by government quarterly. The account is transferable between all the institutions where it can be opened.

7) National Savings Certificate (NSC)

NSC was launched with assured returns and tax benefit. Capital under this scheme is fully protected; rate of interest is also fix and compound annually which is 7.6 at present. Although there is no guarantee against inflation but it can easily manage it. NSC is transferable and one can borrow against it but premature closure

is not allowed. The sum invested in the NSC is eligible for tax deduction under Section 80C up to the Rs 1.5 lakh limit stipulated in a financial year including assured interest.

8) The Kisan Vikas Patra (KVP)

The KVP launched by government of India in with the motive of welfare of farmers through this fund. It doubles the invested money in 100 months. This scheme is backed out by the government in 2011 and relaunched it on November 18, 2014. Although the scheme have not inflation protection but capital is fully protected with the compound interest rate at the time of purchase which is 7.8% at present. KVPs are transferrable, have facility of pledging and permitted premature closure. Source of income of KVP is not taxable.

9) Sukanya Samriddhi Yojana (SSY)

The Sukanya Samriddhi Yojana (SSY) is launched with a socio-economic motive by central government on 22 Jan 2015 at Panipat in Haryana as a part of an ambitious girl child welfare scheme "Beti Bachao, Beti Padhao". It is a tax-free small savings scheme to encourage saving for the welfare of girl child. The parents or legal guardians of a girl aged ten years or below can open an SSY account in the name of the girl child in designated branches of public-sector banks or in a post office under Sukanya Samridhi Yojna Account Rule,2014 with a minimum amount of Rs 1,000 and can deposit amount 1000-150000 Rs per annum. The contribution can't be withdrawn before the girl attains age of 18 for defined expenses, higher education or marriage. The scheme facilitates tax deduction with EEE model. The capital is protected with fix rate of interest and revised every quarter and new rate is applicable to all the subscribers.

Trends and Pattern of Small Savings

India continues remains one of the high savings economies among the emerging market economies. Gross domestic savings constitutes savings of public, private corporate and household among which household savings plays an important role in gross savings (more than 50%) which comprises financial and physical savings. Small saving is one of the important instruments of financial household savings considered under head net claims on government by subtracting investment in small savings out of provident fund contributions and deposit linked insurance funds from the receipts and net of disbursements in form of small savings. But here in this paper we will consider only receipts as small savings in different government sponsored schemes. Small savings (SS) have three types of components i.e. deposits, certificates and Provident Fund (PPF).

TABLE 1 : SMALL SAVINGS							
							Rupees Crore
Year	Deposits	Certificates	Public provident fund	Total2+3+4	% Deposits	%Certificates	%Public provident fund
1	2	3	4	5	2	3	4
1991-92	10551	6687	0	**17238**	61.2	38.8	0.0
1992-93	10151	7414	170	**17735**	57.2	41.8	1.0
1993-94	12229	11642	206	**24077**	50.8	48.4	0.9
1994-95	15791	18526	350	**34667**	45.6	53.4	1.0
1995-96	15920	16828	0	**32748**	48.6	51.4	0.0
1996-97	16428	16680	504	**33612**	48.9	49.6	1.5
1997-98	22622	23668	645	**46935**	48.2	50.4	1.4
1998-99	27621	27182	1017	**55820**	49.5	48.7	1.8
1999-00	37053	31237	1405	**69695**	53.2	44.8	2.0
2000-01	44869	33044	1398	**79311**	56.6	41.7	1.8
2001-02	51746	28078	1929	**81753**	63.3	34.3	2.4
2002-03	70214	33051	2337	**105602**	66.5	31.3	2.2

2003-04	94272	39170	2528	**135970**	69.3	28.8	1.9
2004-05	122616	33369	2534	**158519**	77.4	21.1	1.6
2005-06	130447	39812	3024	**173283**	75.3	23.0	1.7
2006-07	116303	34532	4065	**154900**	75.1	22.3	2.6
2007-08	104250	21364	3347	**128961**	80.8	16.6	2.6
2008-09	120770	22390	3652	**146812**	82.3	15.3	2.5
2009-10	179683	31683	4196	**215562**	83.4	14.7	1.9
2010-11	192012	31387	6837	**230236**	83.4	13.6	3.0
2011-12	166551	17979	6222	**190752**	87.3	9.4	3.3
2012-13	168408	19129	7221	**194758**	86.5	9.8	3.7
2013-14	178040	16946	7074	**202060**	88.1	8.4	3.5
2014-15	213749	19252	8157	**241158**	88.6	8.0	3.4
2015-16	282087	32610	7791	**322488**	87.5	10.1	2.4
2016-17	387955	28985	17261	**434201**	89.3	6.7	4.0
Source :	Reserve Bank of India Bulletin.						

In 1991-92 small saving were 17755 crores rupees which were increased to 434201 crores in 2016-17 means small savings increased by more than 2400 times in the mentioned period. In 1991-92 deposits in total savings was 61.1% which declined and remained below 50% till 1998-99 but after this again its share in total small savings became more than 50% and tend to grow consistently and reached 89.3%in 2016-17. As the share of deposits tend to decline share of certificates increase and vice versa. In 1991-92 certificates were 38.8% in total small savings which has reached to 50.4% in 1997-1998 and starts declined after that, in 2016-17 its share is only 6.7%. Share of PPF in small savings vary from 0% to 4% in the mentioned era.

Figure 1: Gross Small Savings
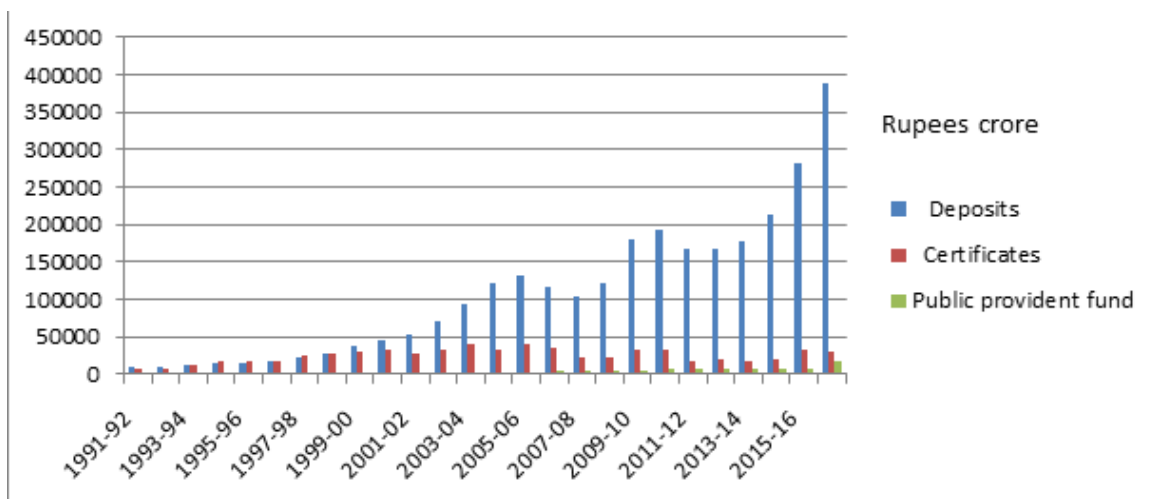
Source: Based on Table 1

Figure 2 : Percentage Of Small Savings in Different Instrument
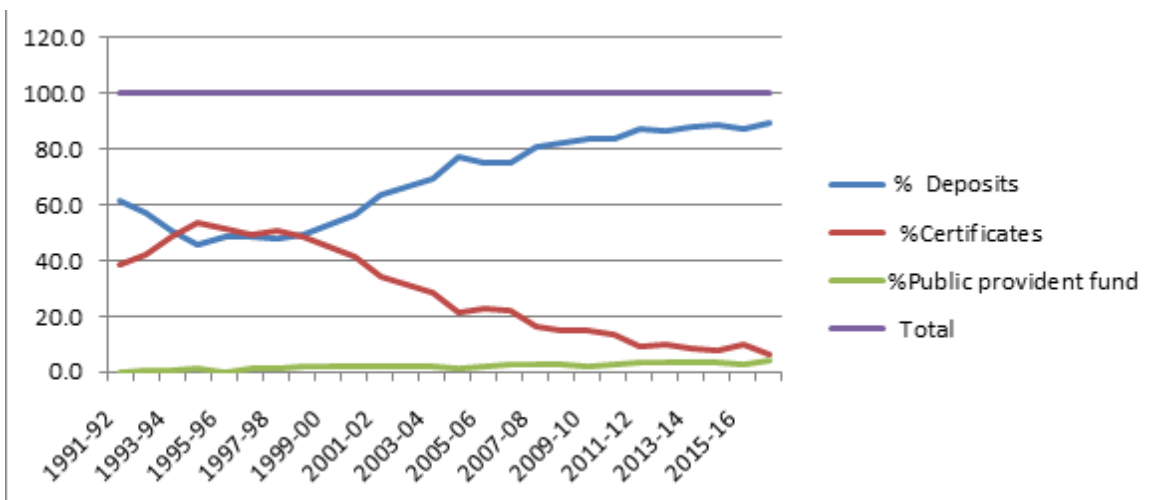
Source: Based on Table 1

Annual Percentage Growth in Small Savings

Table 2: Percentage growth in Small Savings		
Year	Small savings	% increase
1	**2**	**3**
1991-92	17238	-1.6
1992-93	17735	2.9
1993-94	24077	35.8
1994-95	34667	44.0
1995-96	32748	-5.5
1996-97	33612	2.6
1997-98	46935	39.6
1998-99	55820	18.9
1999-00	69695	24.9
2000-01	79311	13.8
2001-02	81753	3.1
2002-03	105602	29.2
2003-04	135970	28.8
2004-05	158519	16.6
2005-06	173283	9.3
2006-07	154900	-10.6
2007-08	128961	-16.7
2008-09	146812	13.8
2009-10	215562	46.8
2010-11	230236	6.8
2011-12	190752	-17.1
2012-13	194758	2.1
2013-14	202060	3.7
2014-15	241158	19.3
2015-16	322488	33.7
2016-17	434201	34.6
Source: RBI Bulletin		

Growth in small savings in these 26 years of post reform manifold it 2400 times although its annual growth has not been consistently increased. It was   -1.6% in 1991-92 and only 2.9 % in next year but in 1993-94 it was 35.8% and grown 44% in following year but declined to -5.5% in 1995-96 and raised by 2.6% in next financial year. The small saving increased by more and less till 2006-07 and shown negative growth rate in following year   but   reached to peak growth rate (46.8%) after a year in 2009-10. Again growth in small savings declined by 17.1% in 2011-12 and after that it is continuously showing positive growth rate which is 34.6% in 2016-17.

Figure 3 : Yearly Growth in Small Savings (in Percentage)
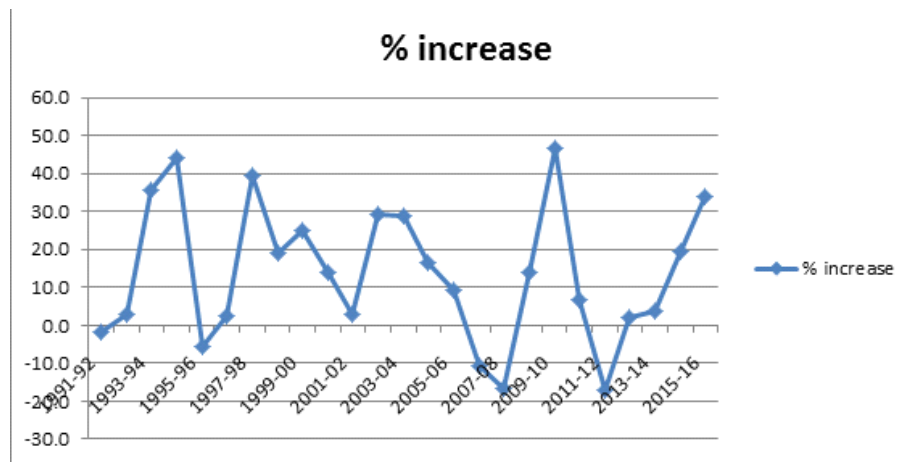
Source: Table 2

Table 3: Percentage of Gross small savings to Total Household Savings

Year	Gross Small Savings(GSS)	Total Household Savings	% Of GSS to Total Household savings
1	2	3	4
1991-92	17238	105632	16.3
1992-93	17735	127943	13.9
1993-94	24077	151454	15.9
1994-95	34667	187142	18.5
1995-96	32748	198585	16.5
1996-97	33612	224653	15.0
1997-98	46935	284127	16.5
1998-99	55820	352114	15.9
1999-00	69695	438851	15.9
2000-01	79311	463750	17.1
2001-02	81753	545288	15.0

2002-03	105602	564161	18.7
2003-04	135970	657587	20.7
2004-05	158519	763685	20.8
2005-06	173283	868988	19.9
2006-07	154900	994396	15.6
2007-08	128961	1118347	11.5
2008-09	146812	1330872	11.0
2009-10	215562	1630799	13.2
2010-11	230236	1800174	12.8
2011-12	190752	2065566	9.2
2012-13	194758	2235279	8.7
2013-14	202060	2285301	8.8
2014-15	241158	2439104	9.9
2015-16	322488	2447989	13.2
2016-17	4,34,175	2479661	17.5

Source: 1. CSO   2. RBI Bulletin

We have calculated percentage of gross small savings to total household savings which was 16.3%in 1991-92 and with having 2-3% fluctuations it reached to 20.7% & 20.8%in 2003-04 & 2004-05. After that it started declining and goes below 10% in 2011-12 and remained below 10% till2014-15. It was 13.2 & 17.5% in respective following years. Although this scenario provide just a gross overview but it shows that total deposits in small savings is large and interest of people in these schemes.

Figure: 4 Percentage of Gross small savings to total Household Savings

Source: Table 3

Conclusions :

We have analyzed trend and pattern in the paper and finds miscellaneous results. Small savings amount raised by more than 2400 times in the mentioned era but there is no growth consistency in its percentage annual growth as we have seen that annual growth of small savings sometimes declined to negative points and also reached to peak growth of 46.8% in 2009-10. There are fluctuations in growth of small savings. Deposits head in total small savings have a highest share throughout the period although there is short decline in initial years of reforms and after 1998-99 it have not shown declining share and at present it is 83.4%. It shows that people like to deposit in schemes rather than in certificates and PPF may be because of their time bonding. Share of certificates increases and decreases inverse to deposits while share of PPF remains in between 0-4%. Results also show that small saving is a viable financial avenue for small savers. Gross small savings remains around 15-20% to total household savings with some exceptional years.

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Status of Biomedical Waste Management in Medium and Small Hospitals of Indore

*Dr. Sakharam Mujalde
**Ms. Jayati Merwani

Abstract

Medical care is vital for our life and health, but the waste generated from medical activities represents a real problem of living nature and human world. Improper management of waste generated in health care facilities causes a direct health impact on the community, the health care workers and on the environment Every day, relatively large amount of potentially infectious and hazardous waste are generated in the health care hospitals and facilities around the world. Indiscriminate disposal of Bio Medical Waste or hospital waste and exposure to such waste possess serious threat to environment and to human health that requires specific treatment and management prior to its final disposal. The present research deals with the basic issues as definition, categories, problems relating to biomedical waste, procedure of handling and disposal method of Biomedical Waste Management, the quantity of waste generated by a hospital per day, the major difference between BMWM RULES 1998 and 2016 and how Bio- medical Waste Management is a business. It also intends to create awareness amongst the personnel involved in health care unit3.

Introduction

As Madhya Pradesh geographically represents the heart of India, Indore is in all senses is the heart of Madhya Pradesh. Indore is the commercial capital of the state and a hub for all major business activities in the Western part of the state. Footmarks of the royal dynasty meet the pace of the business in Indore. A small cosmopolitan is playing the pivotal role in the commerce of Madhya Pradesh. The city, after traversing centuries, is poised to become a software hub, for inclusion in that coveted category of software city. In recent years as the state has advanced, the city Indore has grown manifold and has more business potential to offer than other city of similar stature in the state. Major corporate and business houses including foreign investors have already invested huge sum of money in concurrent projects going on, in and around Indore. Secondly, major efforts are being taken for attracting investors to enjoy the privileges of a developing center.

Indore provides the industries with the complete necessary civic and up to a large extent industrial infrastructure. The Industrial growth in this region has been phenomenal and international companies have,

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solely because of the infrastructure at Indore, chosen to set up their industries here. Soya, pharmaceuticals, automobiles, plastics and packaging are some of the key industries operating here. The city of Indore is well connected through air, rail & road to almost all the major towns of India, which is a boon for the industries. With well developed infrastructure, transport facilities and cheap manpower, the city also turns out to be the educational capital of Central India. Institute like IIM, IIT, SGS Institute of Technology & Science, SVITS, IET & others, ensure that there is a regular inflow of skilled professionals. With a large graduate population (roughly 1 lac graduates are added every year) availability of technical human resource sums up to be Indore's greatest strength. With Air-tel, BSNL, Tata, Reliance & Birla AT&T providing world class telecommunication network, this city is poised to become a corporate address for many. Strategically positioned to become a logistic hub for redistribution of goods within the country, Indore could stake claim as the hardware centre of the country. With multiplex theaters, game parks, discos, golf courses, open air restaurant & hotels like Raddisson, Fortune Landmark & Sayaji, Indore has become an inviting proposition for many a business houses. With all the ingredients of a metro, minus the pollution, traffic & shooting property costs, Indore is everything about opportunity1.

The Bio-Medical Waste (BMW), is defined as any waste generated during diagnosis, treatment or immunization, of human beings or animals or in research activity. The waste produced in the course of healthcare activities has a great potential and possibility for causing injury and infection than other type of waste. As per the recent BMW Management Rules, 2016 these rules apply to all persons who generate, collect, receive, store, transport, treat, dispose or handle BMW in any form including hospitals, nursing homes, clinics, dispensaries, veterinary institutions, animal houses, pathological laboratories, blood banks, Ayush hospitals, clinical establishments, research or educational institutions, health camps, medical or surgical camps, vaccination camps, blood donation camps, first aid rooms of schools, forensic laboratories and research laboratories by whatever name they are called to take all the steps to ensure that such waste is handled without any adverse effect to human health and environment.

According to WHO 2009, around 85% of the hospital waste is non-hazardous, 10% infective and remaining 5% non-infective but hazardous. Management of infectious waste is a major challenge to the hospitals. A study on assessment of healthcare waste generated by Government Hospitals in Agra found out that most of the hospitals, nursing homes and pathological laboratories dispose of the waste in their neighbourhoods due to lack of awareness, inadequate services, limited utilization of existing facilities, lack of adequate institutional arrangements, operation inefficiencies and nodal authorities inefficiency in performing their task effectively. Improperly managed BMW is a potential risk factor for the Health Care Personnel (HCP), the community and environment.

The health care providers should also know the quantity of waste generated in their facility so that appropriate measures can be taken to reduce the waste generation in day-to-day work because, lesser amount of BMW means a lesser burden on waste disposal work and cost saving. Lack of data regarding awareness of BMW management among HCP and also the day-to-day generation of different category of infectious waste from our hospital prompted us to carry out this study5. The hospital waste can be classified into three groups. Waste covered under Group-I Includes Dry Garbage, Wet Garbage, Wet tissues and bones, Plaster casts, Packing materials, Surgical Waste, Metal Waste, Glass, Disposal Plastic Items. The Group-II of hospital waste covers sewage that emanates from bathrooms lavatories toilets, kitchen, pantries, operation theatres, dressing rooms, laboratories and laundries. To this must be added the waste from radiology department comprising of chemical developer and fixer solutions. The Group-III of hospital waste is the radioactive waste from radiotherapy and nuclear medicine department, usually in large teaching hospitals. Hospital waste generated from different units of hospital may cause serious health hazards like spread of HIV infection and Hepatitis-B 2. The health risk is extended beyond the premises of hospital, to both personnel providing support services to the hospital and to the common masses, which are extensively exposed to unprofessionally handled biomedical waste. Hospitals and other health care institutions generate waste, on continuous basis. It may prove to be a possible health hazard to the health care workers, the general public plus the flora and fauna of that area6.

Health Care Facilities in Indore - Health care in Indore has taken a giant leap of change in the past few years and now you have everything that you could possibly think of, when you search for good healthcare in this city. The days are long gone when people used to rush to metros in order to get best treatments and that scenario has taken a completely new turn. The medical facilities that you get in Indore now are so world-class and comparatively at low prices that people from metros come to Indore in order to get the treatments done. Indore health comprises of hospitals, nursing homes, diagnostic centers, rehabilitation centers and maternity homes of the city. The ambulance services, X-ray clinics, chemists and druggists and doctors of the city also form an integral part of the health sector in Indore2. City has 287 hospitals and over 1300 dispensaries, many of which are located in residential complex. Hospitals of the city pay to agency for collection and disposal of bio-medical waste and Indore Municipal Corporation (IMC) provides them a dedicated service for collection and disposal of municipal waste3.

Sources of Biomedical Waste - Hospitals produce waste, which is increasing over the years in its amount and type. The hospital waste, in addition to the risk for patients and personnel who handle them also poses a threat to public health and environment.

Major Sources- Govt. hospitals/private hospitals/nursing homes/ dispensaries, Primary health centers, Medical colleges and research centers/ paramedic services, Veterinary colleges and animal research centers, Blood banks/mortuaries/autopsy centers, Biotechnology institutions, Production Units

Minor Sources- Physicians/ dentists' clinics, Animal houses/slaughter houses, Blood donation camps, Vaccination centers, Acupuncturists/psychiatric clinics/cosmetic piercing, Funeral services, Institutions for disabled persons4.

Review of Literature :

Malini R Capoor, Kumar Tapas Bhowmik, 2017 - Unregulated biomedical waste management (BMWM) is a public health problem. This has posed a grave threat to not only human health and safety but also to the environment for the current and future generations. Safe and reliable methods for handling of biomedical waste (BMW) are of paramount importance. Effective BMWM is not only a legal necessity but also a social responsibility. This article reviews the current perspectives on BMWM and rules, conventions and the treatment technologies used worldwide. BMWM should ideally be the subject of a national strategy with dedicated infrastructure, cradle-to-grave legislation, competent regulatory authority and trained personnel. Improving the management of biomedical waste begins with waste minimization. These standards, norms and rules on BMWM in a country regulate the disposal of various categories of BMW to ensure the safety of the health-care workers, patients, public and environment. Furthermore, developing models for the monitoring of hospital health-care waste practices and research into non-burn eco-friendly sustainable technologies, recycling and polyvinyl chloride-free devices will go in long way for safe carbon environment. Globally, greater research in BMWM is warranted to understand its growing field of public health importance. [10]

Rajiv Kumar, Anil Kumar Gupta, Arun Kumar Aggarwal and Ashok Kumar, 2014 Proper management of Biomedical waste (BMW) generated in a healthcare facility is one of the most important functions of a healthcare worker (HCW) as its improper management not only poses risk to human beings and environment but may also invite legal action against HCW as well as hospital administration. This study was carried out to evaluate quality of BMW management in 1100-bedded hospital attached to a tertiary care public institute in North India.[12]

Prachi Vasistha, Rajiv Ganguly and Ashok Kumar Gupta, 2018 Biomedical waste disposal is very important due to its infectious nature. Proper management of biomedical waste is necessary for maintaining good human health and environment. Biomedical Waste (Management and Handling) rules 1998 under the

Environmental Protection Act, 1986 have been passed by government of India which is to be followed strictly to avoid menace. The purpose of the article is to differentiate between the Biomedical Waste Management practices such as collection, storage, transportation, and disposal along with the generation of biomedical waste undertaken in major public and private sector hospitals in Shimla city. A cross-sectional study and semi-structured interview considering the various biomedical waste management practices and personnel handling of the biomedical waste undertaken in the major public and private sector hospitals in Shimla city through detailed analysis and questionnaire prepared will be used for the purpose of study. The study will quantify the actual values and unveil the difference that lie in management procedures followed by these hospitals in Shimla. The present paper presents some initial findings of the questionnaire analysis carried out in a major public hospital in Shimla.[13]

Kirti Mishra, Anurag Sharma, Sarita, Shahnaz Ayub, 2016 The amount of biomedical waste generated per day is increasing day by day with increase in the healthcare facilities. This paper presents an analysis study of various techniques used for biomedical waste management along with the knowledge and attitude of people and healthcare workers. Along with this the scenario of biomedical waste management in various hospitals in India is discussed. This waste is sometimes very hazardous and can lead to dreadful effects. So, the waste is needed to be treated using adequate treatment method.[16]

Research Methodology

Objectives of the Study- The objectives put for conduction of the research were carefully designed to find out the required results which suited the score of study the most. Following are the objectives which formed the base for the conduction of research:-

1. To study the quantity of waste generated per day at a hospital in Indore

2. To study the existing system of solid waste segregation, collection, transport, storage and disposal at city Indore

Forms of Sampling used:-

Quota Sampling was applied for selecting the hospitals from among the present once. Hospitals were divided into various groups according to the capacity based upon number of beds in particular unit. To select medium and small hospitals, criteria of no. of beds ranging in between 30 to 120 was decided.

Snowball Sampling was applied during the conduction of research based upon the directions and help provided by the previous surveyed unit.

Convenient Sampling was also adopted during the research; the units coming in the way of selected units were also taken into consideration if they belong to the criteria decided for collection of the sample.

Data Collection (Sources) : - According to the nature of the research and objectives levied upon to conduct the research, the data was collected both from primary as well as secondary sources.

Primary Sources include the health care units involved in the survey. A dedicated questionnaire of 05 pages was prepared according to the guidelines of World Health Organization which were available on their official website.

Secondary Sources includes various sources available online, which are used to fulfill the aim of study according to their relevance with the study.

The details about number of Health Care Units surveyed to accomplish the task and find out the results for the research objective are given in Table (01). The Health Care Units across the research area Indore were studied in detail on the grounds of waste generation in a particular Unit each day, the method of segregation, handling, storage, transportation and disposal of waste generated during the operations of the hospital.

All the hospitals selected for the research comes under the category of private hospitals. The Health Care Units were categorized further according to the services which they were providing such as general health care, gynecologists, orthopedics, etc.

(TABLE-01)

| Hospitals	Type of Hospital	No. of Beds
A	Specialist (Gynecologist)	50
B	General	50
C	General	70
D	Specialist (Gynecologist)	30
E	General	40
F	General	30
G	Specialist(Orthopedics)	45
H	General	23
I	General	25
J	General	20
K	Super Specialty	100
L	General	25
M	Super Specialty	100
N	General	60
O	General	20
Total	**15**	**688**

Detailed information was collected from hospital administrators of all the hospitals and Health Care Units with the help of a series of Questions prepared. The questionnaire included questions which will answer the questions such as the quantity of waste generated in each hospital by various activities such as admitted patients, out-patients, pathology, blood bank, surgery, pharmacy etc.

Objective-1 -To study the quantity of waste generated in a hospital per day - For proper waste management, it becomes very important to know the quantity of waste generated from sources. Management plans and policies can be only made after knowing the quantum of material which is to be managed. Now, here the quantity of waste generated becomes very important because it is hazardous in nature and is to be disposed of within time, it also requires utmost care while handling such waste. Knowing the amount of waste generated is the primary objective of the study because according to a report published in Times of India, on August 23, 2013 the overall quantity of waste generated by medical care units in Indore city was around 3 tons per day. Out of which only 2 tons was properly being disposed of and the rest 1 ton was being mixed up with the municipal waste. And this 1 ton is generated by small health care units. It makes the study even more fruitful because the waste generated from small and medium health care units is taken into consideration while carrying out the research.

Categories of Bio-medical waste - : Medical waste has many names such as Biomedical Waste, Clinical Waste, Bio-Hazardous Waste, Regulated Medical Waste, Infectious Medical Waste, Healthcare Waste etc. All the terms mentioned above can be used for the waste generated by a medical unit or a health care unit. The waste generated by non-infectious or regular activities such as sweeping or drug store such empty boxes of medicines are non-hazardous but still are included under the head of Medical Waste. However, the expired medicines will be considered as an infectious chemical waste. Hence, the medical waste can be divided majorly into two categories that are:-
❖ Non-Hazardous Waste
❖ Infectious or Hazardous Waste

Figure-01 illustrates the major types of bio-medical wastes.
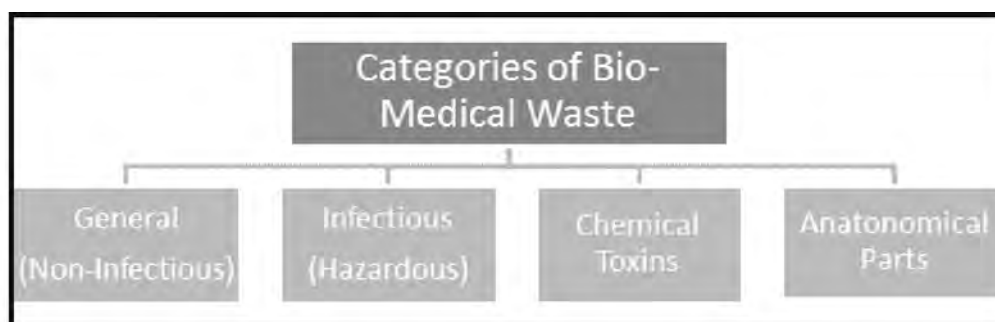
Now, the waste can be further categorized according to sources of their generation at various places at the hospital. Different activities at a health care unit produce different kinds of waste and their by-products which covers a diverse range of materials which are illustrated as under: -

Infectious waste : waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work (e.g. waste from autopsies and infected animals from laboratories), or waste from patients with infections (e.g. swabs, bandages and disposable medical devices);

Pathological waste : human tissues, organs or fluids, body parts and contaminated animal carcasses;

Sharps waste: syringes, needles, disposable scalpels and blades, etc.;

Chemical waste : for example, solvents and reagents used for laboratory preparations, disinfectants, sterilant and heavy metals contained in medical devices (e.g. mercury in broken thermometers) and batteries;

Pharmaceutical waste: expired, unused and contaminated drugs and vaccines;

Cytotoxic waste: waste containing substances with genotoxic properties (i.e. highly hazardous substances that are, mutagenic, teratogenic or carcinogenic), such as cytotoxic drugs used in cancer treatment and their metabolites;

Radioactive waste: such as products contaminated by radionuclides including radioactive diagnostic material or radio-therapeutic materials; and

Non-hazardous or general waste: waste that does not pose any particular biological, chemical, radioactive or physical hazard it is disposed of with common municipal waste but, it is produced at a health care unit so it is to be covered under the medical waste. [19]

Waste Generation

The table (02) shows the quantity of waste generated by all the 15 hospitals which were surveyed. The table shows the average quantity of waste generated by the hospital as a whole under the heads infectious, general, anatomical parts and sharps. The results are displayed below, all values in Kg/day.

Chart-01 shows the average of waste generated by several activities at the health care units

Nature of waste	Hospitals															
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	
General	12	17.5	20.2	9.5	18.5	13.5	15	8.1	13.5	5.1	36.5	8.5	33.2	34.8	6.8	252.7
Infectious	5	13.2	14.5	3.8	2.5	7.3	3.8	1.8	2	1	24.6	4.2	18.3	19.2	1.6	122.8
Chemical Toxins	1	6.8	9.3	0.7	1.8	3.5	5.4	3	.5	.5	13.2	1.5	7.1	5.9	.7	58.2
Anatomical Parts	0.5	1.7	2.1	0.3	0.2	0.4	0.2	0.1	0.1	0.1	3.8	0.8	1.8	0.9	0.1	13.4
Total Generation per day in Kgs	18.5	39.2	46.1	14.3	23	24.7	24.4	10.3	16.1	6.7	78.1	15	60.4	60.8	9.2	447.1

It is visible that the contribution of general (non-hazardous waste) in the overall waste generated is 57% and the rest infectious waste forms 43%. Although the quantity of hazardous waste is comparatively very less but the effect of its getting mixed with the general wastes are very sever.
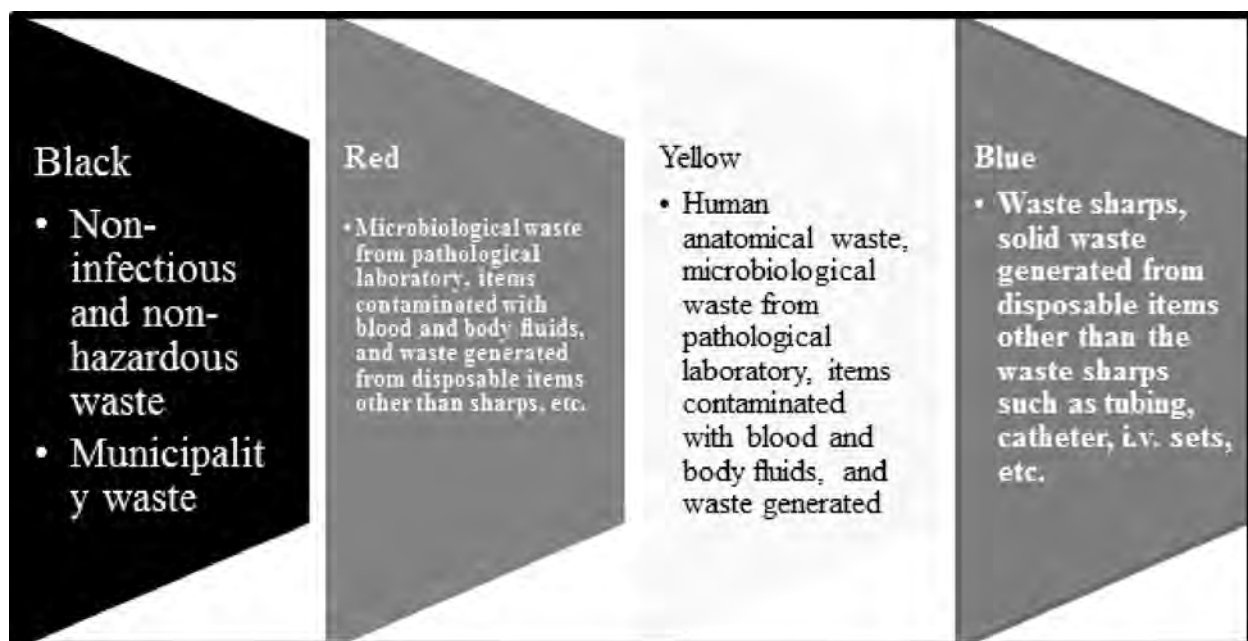
Objective-2 - To study the system of waste segregation, collection, transport, storage and disposal

Segregation of Waste - The waste generated from a hospital can consist of various types of materials, which are to be segregated according to their characteristics and then they are collected and disposed of by different methods. Segregation is considered to be the best way of managing the biomedical waste effectively and reducing the hazardous caused by such waste. Segregation is the method of identifying the wastes and sorting them into color coded bins. Survey in the 15 hospitals reveled that for the purpose of segregation of waste, different colored bins were used with different colored plastic bags in them and sometimes puncher proof
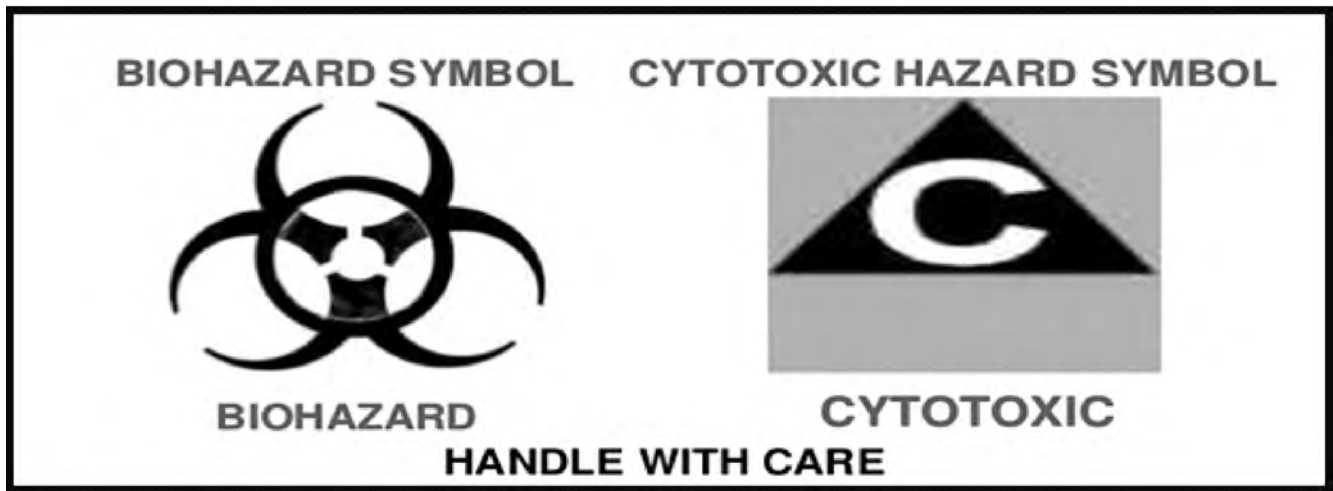
bags in some of the hospitals. These wastes are segregated as and when they are produced during various activities at the hospitals. Color coded bins were found at multiple places inside the hospitals such as at: pathology lab, blood bank, every ward, in the corridors, ICU, operation theaters etc. as per the convenience and requirement of the hospital. In Indore, the guidelines for these color-coded bins are given in every hospital by a private company named HOSWIN INCINERATORS which is affiliated by MP Pollution Control Board for collecting and disposing off the hospital waste. For the purpose of providing proper information there are posters which are having instructions regarding the nature of waste and type of color coded bin in which the waste is to be put. These posters are also printed by HOSWIN and provided to hospitals in order to create awareness among the people regarding the proper collection and disposal of hazardous wastes.

The bins in which waste is going to be kept are classified into majorly 4 categories for small and medium hospitals as they are not involved in treatment of very critical disease like cancer and radiology hence, no radioactive waste is generated out of there. Bins of black, red, yellow and blue color are found in these hospitals, the detailed description of these bins and types of waste which they will bear are specified in Figure-02. Codes are used on the bags, trolleys and dustbins in which waste is collected and is being transported. Generally two codes are used, one is Biohazards Symbol and another is cytotoxic symbol. These are illustrated in Figure-03

(Figure-02)

(Figure-03)

Process View of Generation to final disposal of Bio-medical waste in Indore.

1. • Day to day activities of aHospital

2. • Generation of waste from various sources.

3. • Installation of Color coded bins in the hospital

4. • Waste is thrown in dustbins according to nature of waste

5. • Waste collected by waste-handlerds of the hospital

6. • 3rd party waste handlers, people from Incinerator services collect the waste from hospitals.

7. • According to provision,hazardous symbols are pasted on waste containing bags

8. • Special Purpose waste carrying Vehicles transport the waste to Inceneration Site

9. • Waste is disposed of by Incinerators.

Introduction to Hoswin Incinerators pvt. Ltd. and their work

HOSWIN INCINERATOR PRIVATE LIMITED is a private limited Company incorporated on 06/09/2001 and is 16 Years 8 Months old. It is classified as Indian Non-Government Company and is registered at RoC-Gwalior

The company is involved in Human wastes, removal, Human wastes, treatment and disposal, Maintenance of sewers, drains, Removal of human wastes, Sewers and drains, maintenance, Treatment and disposal of human wastes.

Current status of HOSWIN INCINERATOR PRIVATE LIMITED is - Active.

The company deals in following products: Incinerator

Directors of this company are SUNILA AGRAWAL, SAYYAD ASAD ALI, ANKUR AGRAWAL and AJAY JAIN. [20]

According to the information provided by the executive at Hoswin Incinerators Indore, they are providing disposal facility of bio-medical waste to all the health care units in Indore. They own an incinerator plant at Sanwer Road Industrial area where the waste collected from all over the city is taken and burnt. They give facility of daily collection of waste from all the uits and most importantly is recognized by Pollution Control Board for providing such facility. It is involved in collection of waste from year 2006 and is actively involved in guiding the hospitals over the methods of collection and spreading the awareness for proper disposal of bio medical waste.

It has a fleet of 12 waste carrying vehicles which are dedicated to collection of waste material from all the hospitals, pathology labs, blood banks and mother health care institutions. In the absence of waste management policies of the hospitals, it is a considerable step taken by them to manage the waste and fulfill their social responsibilities.

Suggestions and References

Suggestions

❖   After completing the study, there can be following suggestions for improvement of bio-medical waste management in Indore:

❖   Dependency upon one service provider for the disposal of waste from all over the city, which can be very problematic if the system of that vendor fails. In that case, waste from the city cannot be disposed of. So, dependency should be reduced by keeping in mind sustainable waste disposal.

❖   Monopoly in the sector which is affecting the costs incurred in disposal of waste. There costs affect the small health care units more.

❖   90% of the hospitals were working upon the guidelines provided by the Hoswin Incinerators and does not have their own waste management plans or policies.

❖   Small health care units such as dispensaries are the defaulters who are mixing the medical waste with municipal waste; they are to be controlled for proper management of waste in the city.

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Impact of Mergers on Indian Bank's Efficiency: A Study

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Introduction

Business is subject matter to number of competitions affected by various factors like the bargaining power of suppliers and buyers, entry of new competitors, trade barriers, the threat of substitute products and services, rival firms, adaption of modern technology and globalization etc. In all these circumstances the main motives of any company is to generate economic profits and provide reasonable return to share holders. Mostly, every firm is most concerned with its profitability and to achieve advantageous growth of business and strength. To remain competitive every business need to expand its activities internally or externally.

Concept of Merger :

A mergers or acquisition is a combination of two companies where one corporation is completely absorbed by another corporation. In this process the less important company loses its identity and becomes part of the more important corporation, which retains its identity. A merger extinguishes the merged corporation, and the surviving corporation assumes all rights, privileges, and liabilities of the merged corporation.

Source of Synergy from Merger and Acquisition:-

❖ **Revenue Enhancement**

      Market Expansion or Gain in Marketing Share

      Market or Monopoly Power

❖ **Cost Reduction**

      Economies of Scale

      Complementary Resources

      Elimination of Inefficient Management

❖ **Tax Gains**

      Utilization of Tax Shields

Legal Aspects of Merger and Acquisitions:

  In India there are various laws which are directly indirectly relate to mergers and acquisitions. But major

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law involves in the subject are:

- Company act, 1965 and Company (Court) Rules, 1959 spelling out the legal procedures to effect mergers and acquisitions.

- Company Act, 2002, requiring regulations of monopolistic power arising out of mergers and acquisitions.

- Income Tax Act, 1961, specifying various taxable deduction or tax benefits to various parties associated with mergers and acquisitions.

- SEBI (Substantial Acquisition of shares and Takeovers) Regulations, 1997, which governs takeover of listed company.

Review of Literature :

(Abdullahi, 2009). An Assessment of the Perceived Impact of Merger and Acquisition on the Development of the Banking Industry in Nigeria. The study analyze the supposed impact of merger and acquisition in the progress of Nigerian banking sector. The research tool used for analysis is a self designed questionnaire which was administered to the selected customers, shareholders and employees of United Bank for Africa plc (UBA). The findings of the research are that, the merger and acquisition have paying attention more local and foreign investors to Nigerian banking sector and the bank merger and acquisition have greatly improved the capital based of bank, improve profitability and customer's service delivery through improvement in information technology.

(Aggarwal, 2012). Motives for Consolidation in Indian Banking Sector. In this paper the structure of Indian banking sector and its effect on competition by some ratios of top three, five and ten banks from 1995-96 to 2007-08 have been studied. As the concentration ratio related to assets, deposits, advances and revenue has declined, and CR ratio is one among the lowest in cross country analysis. Hence, strategy of consolidation among banks leaving the top five is suggested that if this strategy is adopted by Indian public sector banks and private sector banks, it can provide high-quality competition to foreign banks.

(Ahmed, 2014). Mergers and Acquisitions: Effect on Financial Performance of Manufacturing Companies of Pakistan. This research is a study on the objectives of mergers and acquisitions, as to why organizations accept the inorganic mode of expansion. This particular research is on manufacturing industries of Pakistan. This study has conducted to get the effect of mergers upon financial performance concerning acquiring firms in a variety of manufacturing industries of Pakistan. This research has taken twelve manufacturing companies involved in the process of merger during year 2000-2009 for their expansion and growth.

(Deepa Chavan, 2014). An Analytical study on ICICI and Bank of Rajasthan Merger. In this case, an attempt has been made to analyze the pre and post merger performance of banks. In this the banks merger has been taken for study is the merger of ICICI Bank and the Bank of Rajasthan. The study based on Secondary Data

and data. The ratios taken by researcher in this research are analyzed by using Paired T-Test to investigate any significant difference. For analyzing the data SPSS.(Paired Sample Statistics) Paired Sample Statistics have been used.

(Debajyoti Ghosh Roy, 2013). Basel I to Basel Ii to Basel Iii: A Risk Management Journey of Indian Banks. This paper shows the passage of Indian Banks from Basel1 to Basel 3.

(Gelda, 2013). A Comparative Study on Performance and Working Capital Management of ICICI and HDFC Banks. The intention of the study is to analyze the various ideas of working capital and find out the viability of the concept of working capital in the radiance of better planning and control of working capital. The sample banks particular for this study are ICICI Bank and HDFC Bank. The time period for the study has been taken was five years from 2007-08 to 2011-12. This study is based on secondary data.

 (Gupta, 2014). An Analysis of Indian Public Sector Banks Using CAMEL Approach. The present study attempts to assess the performance of public sector banks in India using CAMEL approach for a five year period from year 2009-13. The Capital Adequacy, Asset Quality, Management Quality, Earnings and Liquidity have been calculated to analyze the performance and financial position of the banks. this research is a descriptive research. The 26 Public Sector Banks in India have been analyzed for the purpose of the study.

(Prompitak, 2009). The Impacts of Bank Mergers and Acquisitions (M&As) on Bank Behavior. This thesis examines the impact of bank mergers and acquisitions (M&As) on lending behavior by commercial banks. Researcher used the data of European commercial banks from 1997 to 2005. To explain the effects of mergers on bank loan pricing behavior, interest margin setting, credit availability and lending objectives Empirical models were used. The results suggest that merged banks can gain efficiency through mergers and can pass these reimbursements to their customers in the form of lower lending rates and interest margins.

(Subrato, 2007). Commercial banking in India new challenges and opportunities after liberalization. The present research discussed about the challenges and opportunities faced by commercial banks after liberalization. This study explains that in the financial sector, liberalization and technological step forward has commenced reorganization in our banking sector, which is precisely reverse to our structuring norm.

(K.Kalaichelvan, 2011). Implications of Merger: A Perceptional Study. The purpose of this study was to analyze the perceptions of employees of a merge bank and its impact on the performance of banks. A comprehensive survey has done. This survey was among the employees of banks that have gone for merger and acquisition throughout the post-reform period. The study based on primary data. A wide-ranging questionnaire was created with two sections. The first section consisted of the job demographic facts and the second consisted of 14 statements measuring the perception of employees.

(Vijay, 2008).An Effect of Merger on Financial Performance of Corporate Sector in India". The study investigates the financial performance of mergers and acquisitions happened during 1999-2000. The sample has been taken for the study is selected merged manufacturing companies. For this study three financial tools

like RONW, MVA and EVA have been used. The objective of the study is to calculate the pre-and post-merger financial performance of merged companies. The study also fall out on motives variables of mergers such as Profit maximization ,Growth , Tax Consideration , Diversification , Leverage etc.

Research Methodology :

Research Approach : - Exploratory and Descriptive Research.

Data Collection : - The research is based on secondary data. Secondary source of data was gathered from journals, magazines, published articles and other gray material available online containing the information about the merger.

Sample Size and Sample Selection :-

Acquirer company	Target company	Year of merger
HDFC	CBOP	2008-09
ICICI	BOR	2009-10

Period of Study:-

❖   For HDFC bank analysis is from year 2005-06 to 2011-12.

❖   For ICICI bank is from year 2006-07 to 2012-13.

❖   Three years pre and post merger analysis has been done and merger year considered as a base year.

Tools and Techniques

Ratio Analysis and statistics graph

Objectives of the Study:

❖   To study the need and objectives of merger in corporate especially in banking industry.

❖   To study the pre and post financial efficiency of banks consider as cases of merger.

❖   To study the impact of merger on the financial ratios showing financial efficiency of the HDFC and ICICI banks.

Limitations of Research:

❖   There are number of merger and acquisitions have been taken place in different industries. The study is restricted to the banking industry. It is only the corporate efficiency of the banks before and after merger has been considered.

❖   Ratio analysis is used to compare the data and quantitative analysis has been done.

❖   The case study of two banks mergers have been taken for the study i.e. merger of HDFC bank with Centurion Bank of Punjab and ICICI bank with Bank of Rajasthan.

❖   The study is limited to three years before and three years after merger. The merger year considered as a base year.

Amalgamation of Centurion Bank of Punjab with HDFC Bank:

❖   On 23 May 2008 HDFC Bank acquired Centurion Bank of Punjab.

❖   CBoP was valued at Rs. 9,510 crores.

❖   All stock deal (no cash settlement).

❖   HDFC Bank paid Rs. 9,510 crores in shares for absorbing CBoP.

❖   Swap ratio was fixed at 1:29 (1 shares of Rs. 10 each of HDFC Bank for every 29 shares of Rs. 1 each held in CBoP).

❖   No Single lay off of employee.

Merger of ICICI and BoR at Swap Ratio 1:4.72:

❖   Private sector lender Bank of Rajasthan on 13 august 2010 agrees to merge with ICICI bank.

❖   Total asset of ICICI bank was 363,399.71 crores and BoR was 17,300.06 crores.

❖   Swap ratio was fixed of 1:4.72 (ICICI bank gave 25 shares for 118 shares of BoR).

❖   India's second largest bank private sector bank.

Analysis and Interpretation:-
HDFC Bank:-

Ratios of HDFC Bank	Average Ratio Before Merger Period	Average Ratio After Merger Period
Year	2006 to 2008	2010 to 20112
Capital Adequacy Ratio (CAR) (%)	12.69	16.72
Debt to Equity Ratio (times)	12.11	9.48
Advance to Asset Ratio (%)	48.92	57.35
Government Securities to Total Investment (%)	69.00	80.31
Credit Deposit Ratio (%)	64.84	79.58
Gross NPA to Total Advances (%)	1.43	1.17
Net NPA to Net Advances (%)	0.45	0.23
Total Investment to Total Asset Ratio(%)	36.40	26.92
Business Per Employee (Rs. in millions)	623.66	632.33
Profit Per Employee (Rs. in millions)	6.16	7.11
Net Profit Margin (%)	13.98	15.42
Net interest Margin (%)	4.06	3.80
Interest Income to Total Income (%)	81.15	81.96
Non Interest Income to Total Income (%)	18.84	18.03
Liquid Asset to Total Asset (%)	10.18	10.12
Liquid Asset to Total Deposit (%)	13.49	13.53
PE Ratio	27.61	26.57
EPS (in Rs)	7.36	17.61

ICICI Bank

Ratios of ICICI Bank	Average Ratio Before Merger Period	Average Ratio After Merger Period
Year	2007 to 2009	2011 to 2013
Capital Adequacy Ratio (CAR) (%)	13.73	18.91
Debt to Equity Ratio (times)	9.14	6.75
Advance to Asset Ratio (%)	56.94	52.91
Government Securities to Total Investment (%)	67.83	52.44
Credit Deposit Ratio (%)	92.42	98.13
Gross NPA to Total Advances (%)	3.32	3.92
Net NPA to Net Advances (%)	1.15	0.87
Total Investment to Total Asset Ratio(%)	27.18	32.92
Business Per Employee (Rs. in millions)	106.3	75.26
Profit Per Employee (Rs. in millions)	1.0	1.16
Net Profit Margin (%)	10.32	16.24
Net interest Margin (%)	1.88	2.34
Interest Income to Total Income (%)	78.04	81.36
Non Interest Income to Total Income (%)	21.95	18.63
Liquid Asset to Total Asset (%)	9.39	7.92
Liquid Asset to Total Deposit (%)	15.13	14.48
PE Ratio	20.77	18.26
EPS (in Rs)	35.99	57.86

Impact of Merger on HDFC Bank:

❖ Increased foot print and metro presence.

❖ Post merger results are satisfactory.

❖ 7 th largest bank with asset size of Rs. 1097 billion.

❖ Net Profit Margin improved after merger.

❖ After merger combined effort of both the banks resulted in increased investment as well as deposits.

❖ A consistent decline has been noticed in Debt Equity ratio which indicates a favorable scenario for long term creditors.

❖ Credit Deposit ratio has also improved after merger.

❖ EPS shows upward graph.

❖ The merger was in a win-win situation for HDFC Bank as it would acquire around 400 branches and skilled personnel.

❖ HDFC Bank has nearly 750 branches. CBoP has nearly 400 branches. Post merger, both banks will have around 1,150-1,200 branches.

❖ There were significant cross-selling opportunities in the short-term. CBoP management had relevant experience with larger banks (as evident in the Centurion Bank and BoP integration earlier) managing business of the size commensurate with HDFC Bank.

o   High level of write-off due to bad asset quality of CBoP in personal loans and two wheeler loans.

o   Net Interest Margin has decreased after merger.

Impact of Merger on ICICI Bank:

❖ Post merger results are satisfactory.

❖ Merger of BoR an old private sector bank with India's second largest private sector bank will definitely help both of these parties as ICICI bank can extend its activities as it total number of branches will go up to 25% and BoR will also get new direction after the announcement of merger.

❖ The liquidity position of bank has increased after merger.

❖ Net Profit Margin is increasing year by year.

❖ NIM of bank shows positive effect after merger.

❖ Return of Net Worth has been increased after merger and the EPS has taken good move after merger'.

❖ Before merger Debt Equity was high and after merger was low. So, it shows safe financial position of bank after merger.

❖ Credit Deposit ratio and Profit per Employee improved after merger.

❖ The number ATMs and number of customer also increased after merger.

❖ Hence, the merger is good for both the banks.

Conclusion:

Merger of HDFC & CBoP bank and ICICI & BoR highlights the fact that two successful banks merged to form the strong entity that could match Public sector banks in size and strength. The study therefore supports the idea that mergers and acquisitions can generate synergies over the long run if the banks many accurate evaluations, estimate future prospects and carefully allocate their resources. The study shows that mergers and acquisitions can be the first step towards creating a profitable organization but it alone cannot generate synergies and value for the shareholders on a sustained basis. The focus should therefore be on improving governance, risk management and strategic planning. The overall conclusion is that bank mergers appear to be driven for the most part by economically practical objectives and have beneficial effects on the efficiency in the banking industry. Superior management or production technology may have reduced costs more for merged banks more than for non-merged banks and subsequently reap higher profits. Also, improvements in information processing and credit scoring may have resulted in greater costs reductions for the merged banks.

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Information and Communication Technology and Economic Growth: An Inter-State Analysis

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Abstract

Looking into the remarkable growth of ICT services in India over more than a decade and the resulting increase in accessibility to information, the study is an effort to find the impact of ICT on economic growth. With the help of secondary data and simple statistical techniques, the study presents at national and state level scenario of ICT development in the country for both the rural and urban areas. The study finds that though the correlation between ICT index and economic growth is stronger but it totally adverse at the sectoral level. The individual impact of ICT on economic growth is weak both in the short run and long run. But it becomes stronger when ICT is combined with education and urbanization. The study suggests an integrated approach in which the development of ICT facilities be supplemented with development of education and infrastructural facilities.

Introduction

The past two decades have witnessed penetration of Information and Communication Technology (ICT) in all the sectors in developed as well as developing countries. These countries are at different levels in the adoption and usage of ICTs. ICT incorporates the flow of information between two or more networks via internet services. It eases the communication and sharing of information between persons within and beyond the nations' boundaries. The easy access to information enables people to explore knowledge and generate ideas which they can use for improving their quality of life. The knowledge about the opportunities enables the person to utilize their resources in the best possible ways. The decrease in transaction and communication costs allows the business to cross the national boundaries ultimately contributing to economic growth of the country. Now a day, ICT has wide use in all the sectors of the economy.

The ICT service is accessible through telephone, mobile phone, smart phone, computer, laptop, tablet, etc. Among them, the uses of internet service through smart phones have gained high popularity due to its convenience while moving. The decrease in the price of smart phones along with reduction in data charges during the past couple of years have made them highly affordable. A smart phone enables the person to access information at any place and at any time as compared to other devices. The development in the area of internet service over the time particularly 4G networks has further increased the use of smart phones for accessing

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information and remain in touch with the world including their family and friends. On the contrary, landline phones are notoriously expensive and unreliable as they are affected by weather and jumbled wires (Chakrborty, 2014). During the past few years, the launch of various mobile applications and smart phone features has reduced time consumption in accessing the various types of services and social interventions. In a way, ICT services have become more accessible via smart phones, and thus a contributing factor for economic growth.

Like other economies of the world, Indian economy has also experienced an unprecedented growth of internet services over the decade, particularly when web access services were added to mobile phones (viz., smart phones). The cut throat competition among the internet service providers has enabled access to ICT services at reasonable prices and thus connected the residents to the world. Today, it is the world's most competitive and one of the fastest growing telecom markets. [1]The Indian telecom industry has grown more than thirty times in 17 years, from less than 37 million subscribers in 2001 to 1153.51 million subscribers in 2018.

Under the umbrella of liberalization and globalization, ICT has enabled the country to integrate with the world economy. Consequently, the trade and investment related activities have remarkably increased. Currently, India is at a high growth trajectory with an average growth rate of 6-8 percent per annum, greater than the developed countries of the world. However, if we look at the state level scenario, the growth is highly lopsided. Some states have very high growth rate while the other states are lagging behind. India has very diversified features in terms of its geography, economy and socio-cultural aspects. These factors interplay with the growth related factors in various ways. With this background, this study is an attempt to determine the contribution of ICT in economic growth of India. Since Indian states are at various levels of development, this should have different implications for the relationship between ICT and economic growth across the states. The study is focused on the major states of India and tries to find the extent of causal relationship between the two variables taking into consideration their respective levels of development.

The objectives of the present study are as follows:

(1)   To examine the growth of ICT in India.

(2)   To explore the state level scenario of ICT in Rural and Urban area.

(3)   To determine the relationship between ICT and economic growth.

Rest of the paper is as follows: Section-2presentsreview of related studies. Section-3 discusses data, methodology and variables. Section-4 examines the growth of ICT services in India. Section-5deals with distribution of ICT services in India as well as in rural and urban areas.Section-6explores the distribution of ICT services across the states. Section-7 determines the relationship between ICT and economic growth. Section-8 uncovers the relationship of ICT with sectoral growth rates. Section 9 establishes the causal relationship between ICT and economic growth, and finally section 10 concludes the study.

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[1]*Dharmakumar (2011) and Kannan (2010)*

Review of Literature

The telecom services have received considerable importance for the growth of the country (Roller and Waverman, 1996; Thompson and Garbacz, 2007). Thompson and Garbacz (2007) have claimed that growth of telecommunication services improve the productive efficiency of the country as well as of the world. This increases the country's GDP. Among the telecom services, the recent development of ICT has highly been appreciated for its positive effect on economic growth (Farhadi et al., 2012; Jorgenson and Stiroh, 2000 and Niebel, 2014 among others).Particularly, the penetration of mobile phone and internet(viz., broadband) services has gained high popularity for increasing the growth rate of GDP (Lee and Brahmasrene, 2014; Pradhan et al., 2014; WTO, 2008;Kolko, 2012; Stenberg et al., 2009; Katz, 2009 among others).

Vu (2011) discussed three channels through which ICT penetration can affect growth: (i) fostering technology diffusion and innovation; (ii) enhancing the quality of decision-making by firms and households; and (iii) increasing demand and reducing production costs, which together raises the output level. Jakhar (2015) concluded that ICT industry has contributed a lot in promoting the economic growth of the nation through employment generation, direct GDP contribution and exports revenue generation.

Nasab and Aghaei (2009) have concentrated on exploring the supply side of ICT in the OPEC nations over the time span of 1990-2007. Using fixed-effects and random-effects models on a set of panel data, the study found that a 10 percent increase in investment in human capital, viz. secondary and tertiary education increases GDP per capita by 0.1 percent. In the same context, Colecchia and Schreyer (2002) observed that ICT affect the economic growth with an increasing rate. During the first half of the 1990s, ICT contributed between about 0.2 and 0.5 percentage point per year to economic growth and during the second half of the 1990s, this contribution rose to 0.3 and 0.9 percentage point per year.Vu (2005) has provided a cross-country view on this issue by assessing the impact of ICT on economic growth for 50 major ICT spending countries for the period 1990-1995 and 1995-2000. The study revealed that the key determinants of the variance of ICT contribution to growth across economies include education, institutional quality, openness and English fluency. Furthermore, ICT investment has a significant impact on economic growth not only as traditional investment, but also as a boost to efficiency in growth: a higher level of ICT capital stock per capita allows an economy to achieve a higher growth rate for given levels of growth in labor and capital inputs. Kumar and Vu (2014) have explored the nexus between ICT and output per worker in Vietnam for the period 1980 to 2012. The study show that ICT has a momentous short-run (0.002 per cent) and long-run (0.006 per cent) effect on per worker output and a unidirectional causation from capital per worker and ICT.

Jin and Jin (2014) have investigated the effects of internet usage on economic growth. Using a cross-section of 36 high-income countries, the regression result show that frequent usage of the internet has a positive and significant effect on economic growth. The estimated growth effect of internet skills is also found to be greater than the growth effect of math and science skills. Gruber and Koutroumpis (2011) have shown that increased communication technologies have played a significant role in driving economic growth in the last few decades .Bubna and Debnath (2017)have emphasized on mobile coverage in rural India under the Shared Mobile Infrastructure Program in 2007-2009. The study finds that the villages covered under the program had

12 percent additional growth compared to the uncovered villages. The result on luminosity gini suggests that every additional percent of population brought under mobile phone connectivity reduces income inequality by 0.06 percent.

However, some of the studies have a different opinion for the impact of ICT on economic growth. Kiley (1999) has explained the negative contribution of computers to economic growth due to adjustment costs. The study indicated that introduction of new investment good like computers impose large adjustment costs to the economy and decrease economic growth. Jacobsen (2003) has found no significant positive impact of computer penetration on the economic growth of 84 countries during 1990–1999, although the study confirms the positive link among mobile phone and growth.However, for the developing countries, Dewan and Kraemer (2000) has not found statistically significant relationship between ICT and economic growth.

The studies examining the relationship between ICT and economic growth have received very scant attention for developing countries. The developing countries differ widely in terms of developmental factors and thus needs special attention. The present study explores the relationship between ICT and economic growth taking the case of India.

Data, Methodology and Variables

The present study is based upon the secondary data. The data on ICT services at India level and states level are obtained from the sources like Telecom Regulatory Authority of India (The Indian Telecom Services Performance Indicators, Various Report) and Ministry of Statistics and Programme Implementation, Government of India. The state wise per capita net state domestic product and sectoral growth rate of agriculture, industry and services sector were procured from the official website of RBI (www.rbi.org). The data of economic growth are adjusted for base year 2011-12 using wholesale price index.

The growth of ICT services are examined at both India and state level.ICT services comprise both telephone services and internet services. As per TRAI, telephone services imply both the wireline and wireless services. Distribution of ICT services is determined in terms of density which is measured separately for wire line subscribers, wireless subscribers and internet subscribers per 100 populations. State wise ICT index is developed using ranking method by incorporating tele density and internet density. Economic growth of the country is measured in terms of Per Capita Net State Domestic Product (PCNSDP). [2] In order to find whether the states which are high in ICT index also have high economic growth, the ICT index of the states is matched with their respective economic growth with the help of ranking. Since ICT influences all the economic sectors, findings are also obtained for agriculture, industry and service sectors. Correlation coefficients are obtained to find the relationship between ICT index with economic growth as well as sectoral growth. Further, regression estimates are obtained to determine the impact of ICT on economic growth. Following regression models are constructed:

Model 1: $EG = \alpha + \beta_1 ICT + \beta_2 EDU + \beta_3 URB + e_i$

Model 2: $EG = \alpha + \beta_1 ICT + \beta_2 ICT^2 + \beta_3 ICT * EDU + \beta_4 ICT * URB + ei$

Model 3: $EG = \alpha + \beta_1 ICT + \beta_2 ICT^2 + \beta_3 ICT * EDU * URB + ei$

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[2] *Net state domestic product for the year 2015-2016 is based on 2011-12 prices.*

The variables are explained as below:

Dependent variable

Economic Growth (EG): Economic growth is the output of all the efforts in favour of development. It is measured as per capita net state domestic product.

Explanatory variables

(1)   ICT Index (ICT): ICT index is incorporates tele densFity and internet density. Accessibility to ICT decreases the information gaps and enables the population the take the benefits from policies as well as available opportunities. Their engagement in economic activities enhances the economic growth. Thus a positive sign is hypothesized for the relationship between ICT and EG. Further increase in ICT services should accelerate the economic growth. Accordingly, a positive sign is hypothesized for ICT^{2}and economic growth.

(2)   Education level (EDU): A high education level enables the person to acquire skill and get better job opportunities. Here, education level refers to the percentage of population with 10th standard and above. 10th standard is the minimum qualification required to attain skill. Thus higher the share of educated persons, higher is the level of economic growth. On this basis, a positive sign is hypothesized for economic growth and education level.

(3)   Urbanization (URB): Urban area generally has developed infrastructural facilities which support the population in finding the jobs ultimately contributing to economic growth. Urbanization is measured as percentage of population residing in the urban area. An increase in urbanization reflects higher share of population availing the infrastructural facilities for their upliftment and thus higher contribution to economic growth. Thus a positive sign is hypothesized for economic growth and urbanization.

Sometimes the impact becomes stronger when two or more variables are taken together. Assuming that the impact of ICT becomes stronger when the population is educated and has accessibility to all the basic infrastructure. Regression analysis is carried also for the interaction of variables, like, ICT * EDU is considered to measure the combined impact of ICT and education on economic growth, ICT * URB is considered to measure the combined impact of ICT and urbanization on economic growth and ICT * EDU * URB measures the combined impact of ICT, education and urbanization on economic growth.

Growth of ICT Services in India

The past decade has experienced rapid spread of ICT all over the world. Currently, India is enjoying the second position in the world after China in terms of total telephone subscribers and total internet subscribers (Department of Telecommunications, Annual Report 2016-2017). The growth scenario of ICT services in India is shown in table 1. Total telephone subscribers

Table 1
Growth of Information and Communication Technology in India

Year	ICT		
	Telephone Subscribers (In Millions)	Mobile Phone Subscribers (In Millions)	Total Internet Subscribers (In Millions)
2000	28.53	3.1*	0.94
2009	562.16	525.09	15.24
2017	1206.71	1167.44	429.24

*Indian Telecom Growth Story: From 10M To 900M Subscribers In 10Yrs, http://trak.in/tags/business/2007/06/19/indian-telecommunication-story-from-10-million-to-150-million-mobile-subscribers-in-5-years/ accessed on 27-8-2018.

Source: (1) Ministry of Statistics and Programme Implementation, Government of India,(2) The Indian Telecom Services Performance Indicators 2009 and 2017, Telecom Regulatory Authority of India, (3) Telecom Sector in India: A Decadal Profile ,Telecom Regulatory Authority of India.

have increased by 42 times indicating an average increase of 2.5 million subscribers per annum during 2000 to 2017. The growth in telephone subscribers during 2009 to 2017 (2.15 times) is

slow as compared to 2000 to 2009 (19.70 times). It is visible from table that the telephone subscribers which increased during the previous period by 20 times has increased by less than 2 times during the later period.

The telecom sector is highly dominated by mobile phone subscribers. The mobile phone subscribers have increased by 377 times indicating an average increase of 22 million subscribers per annum during 2000 to 2017.The rapid growth in mobile phone subscribers than telephone subscribers shows that mobile phone connections are more preferred than telephone connection. On an average, the internet subscribers have increased at the rate of 25 million per year. The per annum increase in internet subscribers have been higher during 2009 to 2017 (28 times) as compared to that for 2000 to 2009 (16 times). Apart from computer/laptops, internet now a day is widely accessed through mobile (smart) phones. This has increased the information accessibility of the users. According to TRAI (2018), mobile internet users are 89 percent of the total internet users. This comprises 95 percent in rural area and 86 percent in urban area. This shows high connectivity of the internet users and thus high possibility of utilizing the information for raising the income earning activities

Distribution of ICT Services

1 At National Level

Increase in the density of ICT services implies higher connectivity among people and greater accessibility to information. The density of ICT services distribution (viz., wire line, wireless and internet subscribers per 100 populations) in India is presented in figure 1. On account of the decrease in number of telephone subscribers and increase in number of mobile phone subscribers, the density of wire line subscribers has decreased and density of wireless subscribers has increased in India. Figure 1 (a) shows that the density of wire line subscribers have decreased from 3.74 in 2002 to 1.76 in 2018. On the contrary, the density of wireless subscribers have increased from 1 in 2002 to 91 in 2018 (figure 1 (b)). The ease in handling the wireless technology and high mobility makes it more popular as compared to wire line technology.
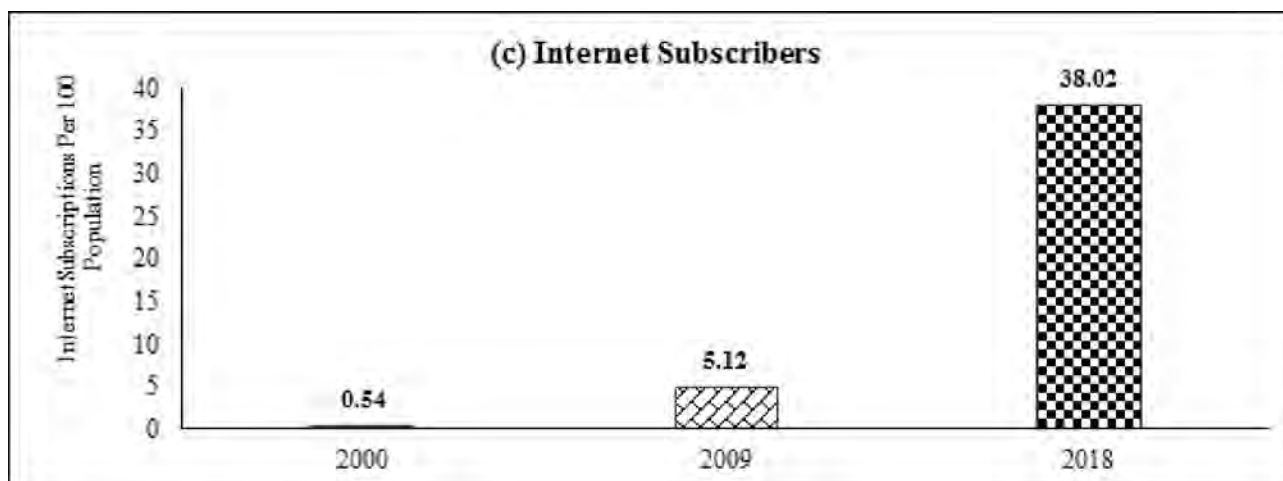
Figure 1
Distribution of ICT Services in India
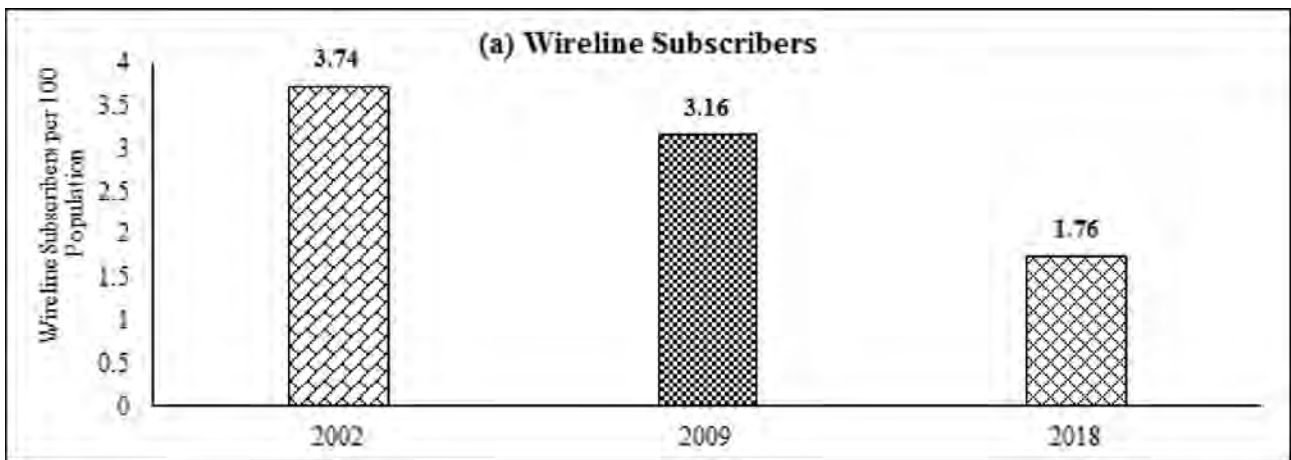
Source: Telecom Regulatory Authority of India (Performance Indicators, Various Reports).
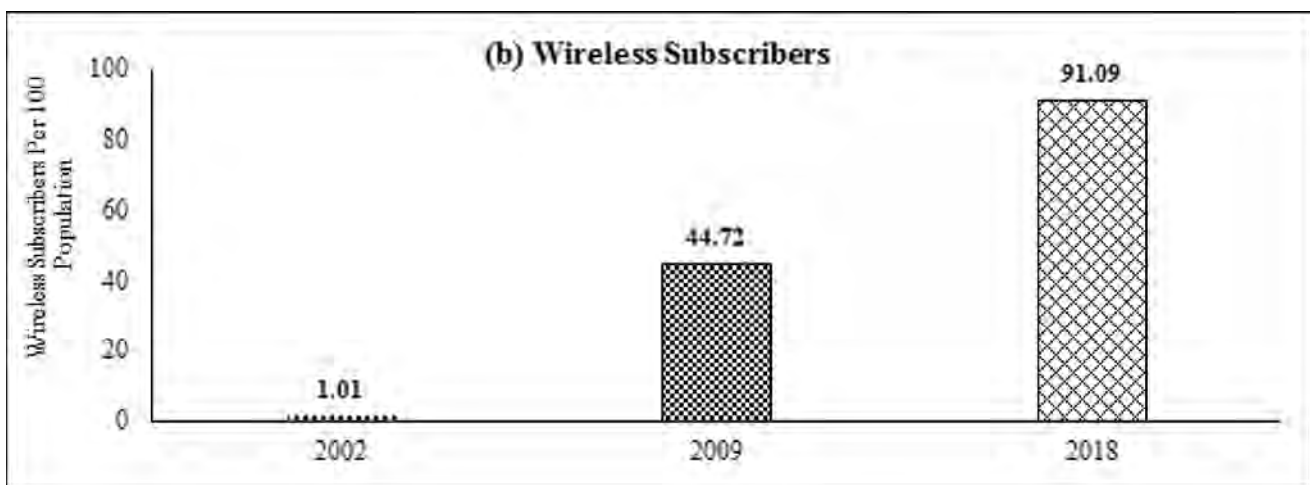
Source: Telecom Regulatory Authority of India (Performance Indicators, Various Reports).

Source :(1) World Development Indicators, The World Bank,(2) (Performance Indicators, Various Reports, Telecom Regulatory Authority of India.

More use of wireless devices as compared to wire line devices is a reflection of increase in mobility [3] and expansion of mobile networks in India. The internet subscriptions per 100 population have increased at a rapid rate from 0.5 percent in 2000 to 38 percent in 2018 (figure 1 (c)). The revolution in mobile technology along with introduction of high speed internet services has brought a boom in the telecom sector.

2 Distribution of ICT Services in Rural and Urban Areas

The distribution of ICT services highly varies between the rural and urban areas. From figure 2, decreasing importance of wire line connection is evidenced both in rural and urban areas. In rural areas, the density of wire line subscribers has decreased from 1.21 in 2009 to 0.38 in 2018 and in urban areas, it has decreased from 7.76 in 2009 to 4.73 in 2018 (figure 2 (a)).

On the contrary, the density of wireless subscribers has increased in both rural and urban areas. In rural areas, the density of wireless subscribers has increased from 19.95 in 2009 to 58.67 in 2018 (figure 2 (b)). While in urban areas, the density of wireless subscribers has increased from 103.2 in 2009 to 161.17 in 2018 (figure 2 (b)). People are keeping more than one connection in order to have greater accessibility. The density of internet subscribers has increased from 10.66 in 2014 to 16.41 in 2018 in rural areas and from 45.33 in 2014 to 84.74 in 2018 in urban areas (figure 2 (c)).

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[3] *People generally move for employment and educational opportunities. Mobile phone facilitates them in keeping contact with family members and also in accomplishing the tasks when moving.*
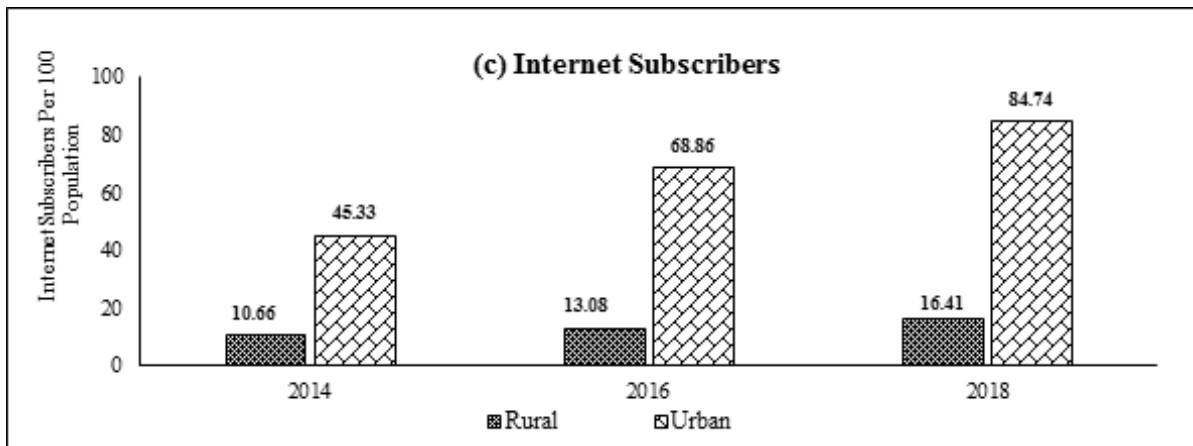
Figure 2
(a) Distribution of ICT Services in Rural and Urban Areas
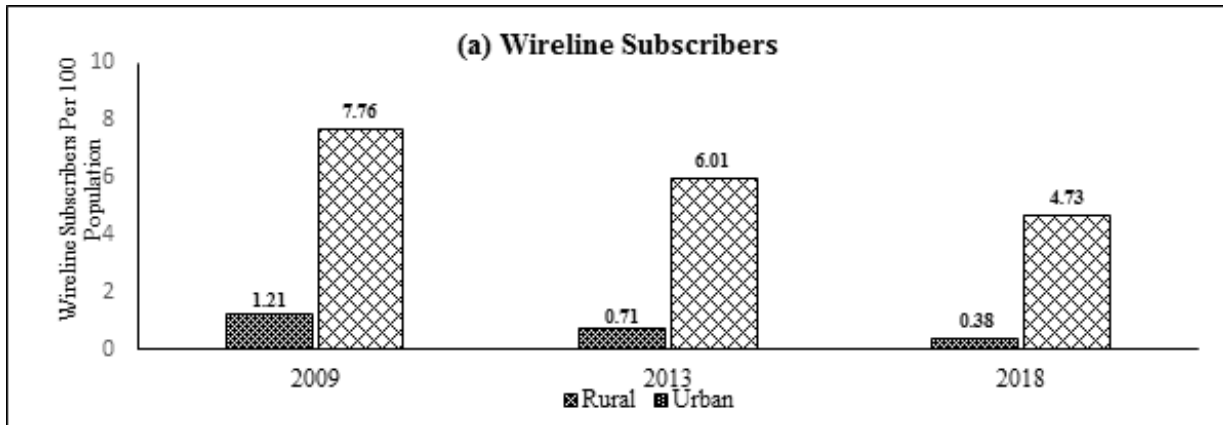
Source: Telecom Regulatory Authority of India (Performance Indicators, Various Reports).
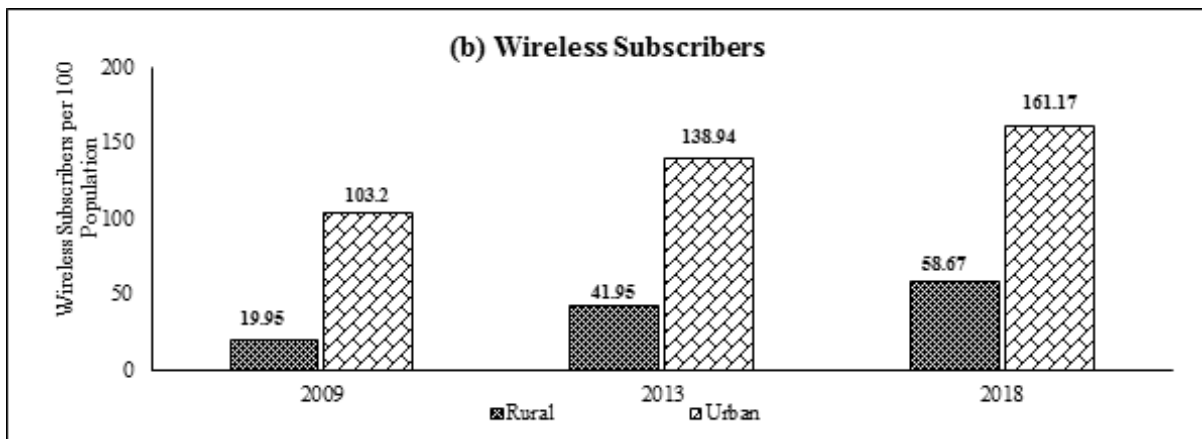
Source: Telecom Regulatory Authority of India (Performance Indicators, Various Reports).

Source: Telecom Regulatory Authority of India (Performance Indicators, Various Reports).

ICT Services across the states

1 Teledensity

Table 2 shows the state wise teledensity for the year 2017. Tamil Nadu (130.13) has the highest teledensity followed by Punjab (121.81), Kerala (120.00), Karnataka (115.08), Maharashtra (110.07) and Gujarat (108.70). Among them, Tamil Nadu (95.90), Punjab (79.88), Kerala (72.88) and Gujarat (71.29) have high rural teledensity. Only Kerala is the state which is high in both rural and urban teledensity. Karnataka is also high in urban teledensity. Bihar has lowest rank in teledensity preceded by Assam, Madhya Pradesh, Uttar Pradesh, Odisha and Rajasthan. These states are also low in rural teledensity. Among them, Rajasthan and Bihar have high urban teledensity.

Table 2
State wise Teledensity (2017)

Rank	Total Teledensity	Rural Teledensity	Urban Teledensity
1	Tamil Nadu (130.13)	Tamil Nadu (95.90)	Kerala (259.39)
2	Punjab (121.81)	Punjab (79.88)	Karnataka (201.67)
3	Kerala (120.00)	Kerala (72.88)	Andhra Pradesh (193.36)
4	Karnataka (115.08)	Gujarat (71.29)	Rajasthan (187.98)
5	Maharashtra (110.07)	Maharashtra (70.35)	Bihar (185.81)
6	Gujarat (108.70)	Jammu and Kashmir (67.92)	Jammu and Kashmir (183.64)
7	Jammu and Kashmir (100.56)	North East (63.08)	Odisha (183.01)
8	Andhra Pradesh (97.14)	West Bengal (62.19)	North East (175.70)
9	West Bengal (93.28)	Haryana (61.97)	Punjab (173.54)
10	Haryana (91.83)	Andhra Pradesh (59.73)	West Bengal (170.08)
11	North East (91.81)	Rajasthan (59.42)	Uttar Pradesh (166.07)
12	Rajasthan (90.60)	Karnataka (58.87)	Gujarat (159.55)
13	Odisha (80.79)	Odisha(58.31)	Assam (154.19)
14	Uttar Pradesh (73.89)	Assam (50.48)	Tamil Nadu (151.70)
15	Madhya Pradesh (68.41)	Uttar Pradesh (46.22)	Maharashtra (151.35)
16	Assam (67.55)	Madhya Pradesh (43.18)	Haryana (142.83)
17	Bihar (60.61)	Bihar (40.48)	Madhya Pradesh (134.30)
	India 93.40	India (56.71)	India (173.15)

Note: (1) Figures in parentheses (   ) shows teledensity.

(2) Data/information for Andhra Pradesh includes Telangana, Madhya Pradesh includes Chhattisgarh, Bihar includes Jharkhand, Maharashtra includes Goa, Uttar Pradesh includes Uttarakhand, West Bengal includes Sikkim and North- East includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland & Tripura states.

Source: The Indian Telecom Services Performance Indicators July September, 2017, Telecom Regulatory Authority of India.

The overall scenario shows unequal distribution of teledensity services across the states as well as between rural and urban areas. The states like Punjab, Karnataka, Maharashtra and Gujarat are at the higher ladder of economic growth, but their low level of urban teledensity and high level of rural teledensity presents a different scenario. On comparing the state wise teledensity with all India, it is observed that out of 17 major states, nearly 50 percent of the states have their teledensity above the national average. The situation is better in rural area as 13 states have teledensity above the national average. For the urban area, nine states appeared to have teledensity above the national average.

2 Internet Density

Further, the state wise density of internet subscribers (per 100 population) for the year 2017 is determined as shown in table 3.It is observed that Punjab (52.60) has the highest density of internet subscribers followed by Kerala (51.77), Tamil Nadu (48.09), Karnataka (46.05), North East (43.88), Maharashtra (43.81) and Gujarat (41.29). Among them, Tamil Nadu, Kerala, North East, Punjab and Gujarat have high density of rural based internet subscribers while Kerala and Karnataka have high density of urban based internet subscribers. On the contrary, Bihar (16.25) has lowest rank in density of internet subscribers preceded by Madhya Pradesh (20.61), Uttar Pradesh (21.32) and Odisha (22.92). These states also have low level of both rural and urban based internet subscribers.

The comparison of rural and urban based internet subscribers shows that among the states which have high density of rural based internet subscribers, particularly North East along with Kerala and Punjab also have high densities of urban based internet subscribers. Also among the states which have low density of rural based internet subscribers, namely Madhya Pradesh, Uttar Pradesh and Bihar also have low level of urban based internet subscribers. Rest of the states has shown a mixed scenario, like Tamil Nadu is the highest in rural based internet subscribers but low in urban based internet subscribers. Karnataka is low in rural based internet subscribers but high in urban based internet subscribers and so on.

On comparing the state wise figures of density of internet subscribers with all India level, it is revealed that as a whole, 10 states are above the national average. The situation is better in rural area as compared to urban area, as rural area includes 12 states and urban area includes 7 states above the national average in terms of density of internet subscribers. As a whole, high internet density in urban area as compared to rural area

reflects the importance of other factors. Viz. education, infrastructure, etc. Rural areas generally have poor infrastructure, low education level and less employment opportunities in non-farm sector. Thus the benefits of internet services should also vary.

Table 3
State Wise Internet Density (2017)

Rank	Total	Rural	Urban
1	Punjab (52.60)	Tamil Nadu (30.94)	Kerala (128.32)
2	Kerala (51.77)	North East (27.72)	North East (108.59)
3	Tamil Nadu (48.09)	Kerala (25.89)	Karnataka (91.46)
4	Karnataka (46.05)	Punjab (23.96)	Punjab (88.03)
5	North East (43.88)	Gujarat (19.90)	Andhra Pradesh (85.78)
6	Maharashtra (43.81)	Jammu and Kashmir (19.57)	Jammu and Kashmir (84.67)
7	Gujarat (41.19)	Maharashtra (18.79)	Rajasthan (76.77)
8	Jammu and Kashmir (37.93)	Haryana (17.41)	Assam (70.82)
9	Andhra Pradesh (36.42)	Andhra Pradesh (17.23)	Gujarat (70.13)
10	Haryana (35.32)	Assam (16.60)	Maharashtra (69.81)
11	West Bengal (30.28)	Karnataka (16.57)	Odisha (68.95)
12	Rajasthan (29.10)	West Bengal (14.90)	West Bengal (68.28)
13	Assam (25.52)	Rajasthan (13.84)	Haryana (65.92)
14	Odisha (22.92)	Odisha (12.80)	Bihar (61.15)
15	Uttar Pradesh (21.32)	Uttar Pradesh (10.71)	Tamil Nadu (58.89)
16	Madhya Pradesh (20.61)	Bihar (9.02)	Uttar Pradesh (56.66)
17	Bihar (16.25)	Madhya Pradesh (7.54)	Madhya Pradesh (54.74)
	India (33.22)	India (14.62)	India (73.65)

Note: (1) Figures in parentheses ( ) shows teledensity.

(2) Data/information for Andhra Pradesh includes Telangana, Madhya Pradesh includes Chhattisgarh, Bihar includes Jharkhand, Maharashtra includes Goa, Uttar Pradesh includes Uttarakhand, West Bengal includes Sikkim and North- East includes Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland & Tripura states.

Source: Telecom Regulatory Authority of India (The Indian Telecom Services Performance Indicators July September, 2017

Relationship between ICT and Economic Growth

In order to find the relationship between ICT and economic growth, ranks of ICT index are matched with economic growth of the states and further the difference between the ranks is calculated. The negative sign shows that the economic growth rate is faster than the growth rate of ICT services and the positive sign indicates high growth rate of ICT services than the economic growth rate. The sign is found to be highly negative for Haryana followed by Gujarat and Maharashtra. These states are in the category of highly developed states in the country. The difference is highly positive in Punjab followed by Tamil Nadu. These states are leading in terms of growth of ICT index but lagging in terms of economic growth. The rank correlation coefficient between ICT index and economic growth is found to be highly positive and significant, indicating the movement of both the variables in the same direction.

Table 4
State wise Ranks of ICT Index and Economic Growth

States	ICT index	Rank of ICT index	Economic growth	Rank of Economic Growth	Difference in ranks
(1)	(2)	(3)	(4)	(5)	(6) $(5) - (3)$
Andhra Pradesh	59.26	7	86118.38	8	1
Assam	18.52	12.5	48465	12	-0.5
Bihar	9.26	15	24572	15	0
Gujarat	70.37	6	122502	2	-4
Haryana	44.44	9	133591	1	-8
Jammu and Kashmir	44.44	9	60171	10	1
Karnataka	77.78	4	113506	5	1
Kerala	92.59	3	119763	4	1
Madhya Pradesh	18.52	12.5	46783	13	0.5
Maharashtra	74.07	5	121514	3	-2
Odisha	22.22	11	57616	11	0
Punjab	98.13	1	99371.92	7	6
Rajasthan	44.44	9	66341.52	9	0
Tamil Nadu	96.30	2	111453.8	6	4
Uttar Pradesh	14.81	14	36883.4	14	0
Rank correlation coefficient = 0.748**					

Note: ** indicates significance at 1 percent level.

Source: Author's calculation.

Further the states are categorized into high, moderate and low category for their ICT index and economic growth as shown in table 5. It is observed that the states maintain almost the similar position in terms of their ICT index as well as economic growth.

Table 5
Relationship between ICT Index and Economic growth in India

Category	ICT Index (2016)	Economic growth (2016)
High	Punjab, Tamil Nadu, Kerala, Karnataka, Maharashtra and Gujarat	Haryana, Gujarat, Maharashtra, Kerala, Karnataka, Tamil Nadu, and Punjab
Moderate	Andhra Pradesh, Haryana, Rajasthan and Jammu and Kashmir	Andhra Pradesh and Rajasthan
Low	Odisha, Uttar Pradesh, Assam, Madhya Pradesh and Bihar	Jammu and Kashmir, Odisha, Assam, Madhya Pradesh, Uttar Pradesh and Bihar

Source: Telecom Regulatory Authority of India (The Indian Telecom Services Performance

Indicators October - December, 2016). Central Statistics Office, Ministry of Statistics and Programme Implementation, Government of India,

The states of Punjab, Tamil Nadu, Kerala, Karnataka, Maharashtra and Gujarat are found to be in high category of ICT index as well as their economic growth. The states of Haryana and Jammu and Kashmir are moderate in terms of ICT index. But Haryana is in high category and Jammu and Kashmir is in low category of their economic growth. The rest of the states in the moderate and low category have maintained their similarly status in terms of ICT index and economic growth..

ICT and Sectoral Growth Rates

Further, the ICT index of the states is compared with their sectoral growth rates over the decade (Table 6). There is huge diversion between the ranks of sectoral growth rates and ICT index. Punjab which tops in the ICT index lags in terms of its growth in agriculture and manufacturing sector. Bihar which is at the bottom in ICT index is at a favorable position in growth of manufacturing and service sector. Rest of the status has also

shown differences in terms of their ranks of ICT index and sectoral growth rates. Rank correlation coefficient between ICT index and growth of the sectors is found to be negative though insignificant.

Table 6
ICT Index and Sectoral Growth

States in Descending Order of ICT Index	Growth over the decade (2006 – 2016)		
	Agriculture sector	Manufacturing sector	Service Sector
Punjab	4.93(13)	3.10(15)	8.46(7)
Tamil Nadu	12.39(3)	7.97(10)	6.47(13)
Kerala	5.47(12)	12.65(3)	6.63(11)
Karnataka	4.67(14)	8.53(9)	16.82(1)
Maharashtra	8.62(6)	5.71(14)	5.71(14)
Gujarat	10.12(5)	12.59(4)	4.72(15)
Andhra Pradesh	10.72(4)	7.30(11)	9.67(5)
Haryana	6.42(8)	9.01(8)	10.08(4)
Jammu and Kashmir	3.49(15)	14.71(2)	12.35(2)
Rajasthan	17.18(1)	6.68(13)	9.61(6)
Odisha	5.58(11)	15.03(1)	6.70(10)
Assam	6.73(7)	12.26(6)	6.61(12)
Madhya Pradesh	12.84(2)	6.92(12)	6.92(9)
Uttar Pradesh	5.73(9)	9.24(7)	7.52(8)
Bihar	5.64(10)	12.49(5)	10.59(3)
Rank correlation coefficient between ICT index and sectoral growth rates	-.127	-.334	-.206

Note: Figures in parentheses ( ) shows ranks in descending order.
Source: Author's Calculation based on TRAI and CSO Estimates

The rank correlation coefficient shows that which states have higher ICT index also have positive growth rate in industry sector. But which states have lower ICT index, also have negative growth rate in agriculture sector as well as services sector.

Regression Results

Regression results in table 7 show that the impact of ICT on economic growth is insignificant both in the short run and long run (as indicated by ICT^2). The impact of education is positive but insignificant. The impact of urbanization on economic growth is found to be positive and significant. The positive and significant impact of combined variables, viz. ICT * EDU and ICT * URB in model 2 and ICT * EDU * URB in model 3 show that education and urbanization strengthens the impact of ICT on economic growth.

Table 7
Regression Results

Dependent variable: EG			
Variables	Model 1	Model 2	Model 3
Constant	-53.29	38.09	48.05
ICT	27.056	-45.18	-45.36
ICT^2	-	-18.04	9.29
EDU	69.24	-	-
URB	14.26*	-	-
ICT * EDU	-	28.30*	-
ICT * URB	-	15.65*	-
ICT * EDU * URB	-	-	5.76**
R^2	.624	.686	.710
Adjusted R^2	.577	.623	.691

*Note: ** and * represents 5% and 10 percent level of significance.*
Source: Author's calculation

Conclusion

There has been a rapid growth of ICT facilities in India during the past more than a decade. Particularly the development of internet connectivity is a breakthrough in increasing the accessibility to information which can be utilized for economic and social upliftment. However, the uneven distribution of ICT index across the states as well as between the rural and urban areas leads to differences in the attainment of goals. The difference in the development of educational and infrastructural facilities is reflected in the usage of ICT

facilities and its impact on economic and sectoral growth.

The study finds that development of ICT index alone is not able to influence the economic growth of the country. ICT when combined with education and urbanization produces a significant impact on economic growth. This shows that in order to maximize the benefit from ICT development, there is a need to strengthen the education sector as well as the infrastructural facilities.

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