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From Editor's Pen

For the development and rapid expansion, Indian manufacturing sector calls for intensification and amplification of economic reforms that would strengthen the sector and make it grow faster and become an engine of inclusive growth. The manufacturing sector of the country is really on a challenging front and to maintain and enhance the level of efficiency and productivity of Indian manufacturing, there is urgent need to have rational review of existing policy framework. Recognizing this fact, Union Government after a long debate and discussion come out with a new industrial policy statement in the form of National Manufacturing Policy on 4th of November, 2011. After Industrial Policy Statements of 1948, 1956 and 1991, the NMP is going to be another milestone in the history of independence India. Presently the size of manufacturing sector of India, in terms of constant value addition is about 13 per cent than that of China and there seems extreme potential of improvement on this frontage. But, increasing the share of manufacturing sector from present 15 per cent to 25 per cent by 2012 demonstrates some flaws on arithmetic calculation basis. While summing up, the NMP seems to be a well prepared document but we should not remain 'tiger on paper' only. Rather, the plan should be implemented effectively, professionally in a continuous, flexible and result oriented mode for fulfilling the dreams of becoming a super economic power in the coming decade or so. In the light of this discussion the new issue of the Arth Anvesan- a bi-annual journal comprises a total of ten research papers. The first composition of the issue by Brijesh C Purohit has shown that how the medical tourism can improve the employment avenues for voluntary unemployed medial manpower who actually avoid rural based jobs due to lack of adequate facilities and proper working conditions. Mukund Kumar and Vikas Gupta through his contribution exploring the consumer attitude towards sustainable food consumption in India has suggested that consumers favour the sustainable food products but their actual buying behaviour is not supporting their claim. Underlining the impact of special incentives package in Himachal Pradesh, Rashmi Chaudhary and Y.S.Parmar has concluded that government incentives and concessions have not proved expected boosters of profitability for the industrial units thereby reducing the future chances of incentives. Gagan Deep Sharma and Sanjeet Singh at the same time has identified the cause and effect relationship of sales and advertisement in case of manufacturing companies and concluded that there is one-sided relationship between advertisement and sales wherein advertisement expenditure positively impacts the sales revenue of business. Studying the sample of farmers, wholesaler/commission agents and retailers, Jasbir Singh and Arshad Mahmood has analysed the marketing of vegetables in Jammu district and mentioned that major problems observed in marketing were high cost of transportation, trader's commission, packing materials, seasonal gluts, distress sale, losses at every stages, volatile behaviour of prices, etc. Further, Nishi Sharma has made a call for an urgent action to accountable and inclusive development by putting the question mark on sustainability of India's development. The composition on SARFAESI Act and Non-performing assets by Naresh Malhotra and Parvesh kumar has made recommendation that Indian private sector banks should continue to remain focused in their efforts to recover their non-performing assets and loans, to maintain the positive and effective trend of improving their asset quality. Surinder Sharma in his study on growth and forecasts of FDI inflows to BRIC countries suggested the policy makers to learn the need to relax the business regulations, focus on human capital, build infrastructure and propel service sector in order to attract the investors in India. Comparing the volatility in spot market and derivative market, Sanjay Garg mentioned that volatility in spot market is less as compared to other the futures markets at the index level. The present issue of journal wrap up with a short communication for research and discussion from Amarjit Singh Sethi on global financial crisis and its impact on India's GDP growth.

Supran Kumar Sharma

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Will Medical Tourism Help the Poor?

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ABSTRACT

India is now a favorable destination for medical tourism. Due to its comparative cost advantage it provides first world treatment at third world prices. This paper aims at dealing with two issues relating to medical tourism in India. First, it dispels the fear that encouragement to medical tourism may be anti-poor. It presents arguments to establish that this encouragement to medical tourism could provide an additional source of revenue to government if an appropriate regulatory mechanism to tax the monopoly corporate hospitals is in place. It further argues that medical tourism should reduce cost of excessive capacity in corporate hospitals in India. This may help better allocation of health resources in private sector since most of the hi-tech treatment under medical tourism is in corporate hospitals and not in public ones. However, the benefit of this reduction in cost of excessive capacity could be available if regulatory measures to tax and distribute the proceeds across poor patients who cannot afford hi-tech care are in place. The paper emphasizes that medical tourism is necessarily welfare oriented given that: 1) it adds to the comparative advantage of a country vis a vis other countries 2) it utilizes excess capacity of corporate hospitals leading to a better allocation or optimal utilisation of invested resources in the hospital sector and 3) with monopoly taxation it provides another source of revenue and treatment avenue to additional poor patients. The analysis also suggests that the apprehension of diverting manpower from public health system is rather misplaced. On the contrary, medical tourism may improve employment venues for voluntary unemployed medical manpower who actually avoid rural based jobs due to lack of adequate facilities and proper working conditions.

Key Words: Hospital, Medical Tourism, Welfare, World

Introduction

There is no one definition for medical tourism but it is generally accepted that this term is used to signify travel activity that involves a medical procedure or activities that promote the wellbeing of the tourist. (Lee and Spisto, 2007). In general, medical tourism and health care tourism may also be distinguished in terms of the latter incorporating other components namely, cosmetic surgery, alternate therapies and fertility treatment whereas medical tourism may focus on treatment of illness and surgical procedures only(TRAM, 2006). At present, keeping in view the comparative cost advantage, almost all the countries in the world offer some form of medical tourism[1]. It is presumed that this industry may attract more resources both from governments and private investors.

Analysis of medical tourism has been carried out using Porter's diamond model of national competitive advantage (Porter, 1990). It is used to conceptualize the four conditions that are important when conducting international business. These four factors originate from country and firm-based theories (Fisher et al, 2006). Thus, in the Porter type of analysis in the shape of a two dimensional diamond, four main components are included which include factor conditions, demand conditions, related and supporting industries, and firm strategy, structure and rivalry. Two additional elements, which refer to chance and government, were later included in the conceptualization to recognize the importance of these components in the influence of international business. In Indian context, a study conducted by the Confederation of Indian industry and Mckinsey consultants (2002) indicates that in 2005 around 150,000 foreigners visited India for medical treatment and number is rising by 15 percent every year. According to the study, India has the potential to attract 1 million medical tourists per annum and this could contribute around US$ 5 billion to the economy. Another estimate suggests that medical tourism business in India is growing at 30 per cent annually and it has the potential to generate as much business as software exports (The Economic Times, Jan. 20, 2008). It is also emphasized that to exploit the potential, government and corporate sector need to join their efforts. This may also require hospitals and their medical and paramedical staff and tour operators to be properly trained so that they handle the growing number of foreign tourists with desired care and courtesy. Keeping in view comparative cost advantage, visitors under medical tourism to India include patients from Arab countries, Africa, south-east Asia, America and Europe. According to some estimates, last year more than 70000 medical travelers were from the Middle East and 50000 people from Bangladesh and Nepal. India, thus,

[1] As suggested by some reports a list of these countries include Argentina, Australia, Bahrain, Bangladesh, ,Costa Rica, Cuba, Cyprus, Czech Republic, Dubai, France, Germany, Greece, Hungary, India, Iran, Israel, Japan Jordan,,, Korea, Lebanon, Lithuania, Malaysia, Mexico, Netherlands, Oman Peru, Philippines, Poland, Romania, Russia, Saudi Arabia, South Africa, Switzerland, Taiwan, Thailand, Turkey(TRAM, 2006)

provides first world treatment at third world prices with a cost differential, which merely is one tenth and sometimes even a sixteenth of the cost in the west. Thus, in view of its huge business potential, a number of government and private hospitals in India have joined hands to promote medical tourism. Notable among them are AIIMS, Apollo Hospitals, B.M.Birla Heart Research Centre, Christian Medical College, Vellore, Tata Memorial Hospital, Mumbai, Apollo Cancer Hospital, Chennai, Indraprastha Medical Corporation, Delhi, and Institute of Cardiovascular Diseases, Chennai.

Simultaneously, tourist industry has geared up to facilitate medical tourism through special arrangements to pick up medical tourists from airports and lodge them in luxury rooms of hospitals, having all the modern amenities like the internet, television, fridge, air conditioner and telephone etc. Even the state of Maharashtra has also formed Medical Tourism Corporation of Maharashtra (MTCM) in collaboration with FICCI to attract medical tourists from rich countries. In fact as an initiative under MTCM, 830-bed Wockhard Hospital in Mumbai has also come up.

Now, the question to be considered is: how will growing medical tourism affect people at large in India? The protagonists assert that it will bring huge foreign exchange resources to the country that will accelerate country's economic growth. More jobs will be created and this will benefit people at large. It is also presumed that the earnings from medical tourism will trickle down to health care infrastructure and services in rural areas, where more than 65 per cent of the people are living.

The ground reality at the moment point out that better hospitals in the government sector are available mostly to those who have some kind of influence, be it political, social or financial. Despite various incentives to private sector hospitals and nursing homes like land and other infrastructural facilities at concessional rates from the government, these establishments do not cater the needs of the weaker sections of the society (Purohit, 2009). At present there are hardly 4 qualified doctors per 10,000 population and in rural areas doctors do not want to go because of the lack of infrastructure and the amenities for their decent living. Lastly, in the years to come, when medical tourism business flourishes, there is bound to be a boost to racketeering in human organs and the poor and the ignorant will be deprived of their organs by unscrupulous doctors and hospitals for the benefit of the rich.

It is high time that the pros and cons of medical tourism should be debated in parliament as well as in other public forums[2].

Pertinently, at present there are several characteristics that make India a medical tourism destination for foreign visitors. Particularly an advantageous position of the country in terms of well-trained health practitioners, availability of super-specialty centers, technologically advanced diagnostic equipments and relatively lower cost of these services make it a prominent destination[3].

Further some of the cities have made them popular for certain type of treatments. For instance, New Delhi for cardiac care; Chennai for quality eye care; Kerala and Karnataka as hubs for state-of-the-art ayurvedic healing. Even the Government of India has also encouraged tapping the potential of this sector to promote India as a "global health destination". The National Health Policy 2002 (GoI, 2002) strongly encourages medical facilities to provide services to users from overseas. It states that "providers of such services to patients from overseas will be encouraged by extending to them foreign exchange, all fiscal incentives, including the status of "deemed exports", which are available to other exporters of goods and services" (GOI, 2005).

The Indian Ministry of Tourism has started a new category of visas for the medical tourists. These visas called the "M" or medical-visas are valid for one year but can be extended up to three years and are issued for a patient along with a companion (Chinai and Goswami, March 2007). These factors have favored the recent spurt of medical tourism in India. Official figures indicate that medical tourists from 55 different countries come to India for treatment[4]. Besides, foreign health travelers to India

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[2] http://girishmishra.com/Articles/medical_tourism.htm

[3] In fact, the costs of comparable treatment are on average one eighth to one fifth of those in the West. For instance, a cardiac procedure costs anywhere between US$ 40,000 - 60,000 in the United States, US$ 30,000 in Singapore, US$ 12,000 -15,000 in Thailand and only US$ 3,000 -6,000 in India. Likewise, the associated costs of surgery including Bone Marrow Transplant, Liver Transplant, Open Heart Surgery (CABG), Hip Replacement, Knee Surgery, Hysterectomy and Gall Bladder removal are also low (IBEF,2005).

[4] India's rise in medical tourism. The Times. 08/14/2007. Link: http://www.timesonline.co.uk/tol/travel/destinations/india/article2257994.ece

comprise of a large number of non-resident Indians (NRIs). If the present trend continues trade in health and health-services will become one of the biggest sectors in India. There are however several challenges that could impede the growth of medical tourism in India. Even more importantly, it is being suggested that the growth of this sector may pose a threat to the already crippled public health system in India (Hazarika, 2008); Reddy and Qadeer, 2010). This paper aims at dealing with two issues relating to medical tourism in India. First, it dispels the fear that encouragement to medical tourism may be anti-poor. In the next section after describing the challenges and issues in expansion of medical tourism, it presents arguments in section III to establish that unlike the apprehensions this encouragement to medical tourism could provide an additional source of revenue to government if an appropriate regulatory mechanism to tax the monopoly corporate hospitals is in place. In section IV it analyses the possible impact of medical tourism on public health system manpower. Final section comprises the concluding remarks.

Challenges and Issues in Expansion of Medical Tourism in India

The present growth in medical tourism in India may have important impact on the public healthcare delivery and on the poorer patients which is necessary to comprehend so that necessary corrective measures can be undertaken.

At the moment, even after three decades of the Alma-Ata Declaration, "health for all" remains an unattainable goal in India. Factors like low government expenditure on health, poor management of resources, acute shortage of skilled workforce have reduced the efficiency of public health system (Purohit, 2010 a, b). Coupled with this emphasis on private sector involvement and encouragement to private sector through incentives of the government (such as release of prime building land at low rates, exemptions from taxes and duties for importing drugs and high tech medical equipment and concessions to doctors setting up private practices and nursing homes) have helped the private sector more at the cost of poorer patients[5]. The recent boom in medical tourism has occurred in a context where nearly one third of India's population live below the poverty line and have no access to basic health care and infant and maternal mortality rates are high.

As skilled health workers move out of the public health sector, expansion of the private sector may be at some cost to the public sector involving doctors who are busy treating the rich in India. As one health researcher has pointed out: The poor in India have no access to healthcare because it is either too expensive or not available. Now we have another trend. For years we have been providing doctors to the western world. Now they are coming back and serving foreign patients at home (Ramesh, 2005).

In terms of equity and increasing market in medical care, the Indian health system has become even more dichotomous with the growing emphasis on technology and private enterprise. The increasing trade in health services is expanding and by becoming more competitive it is creating new dimensions of globalization.

Will Medical Tourism Help the Poor?

In this paper it is argued that medical tourism should reduce cost of excessive capacity in corporate hospitals in India. As discussed below due to predominance of private corporate hospitals in hi-tech treatment, this reduction may benefit poor patients if through tax regulation the extra revenue collected from additional profits of corporate hospitals could be distributed to poor patients.

Let us suppose that loss due to excess capacity to corporate hospitals is L.

Now due to medical tourism a hospital utilizing its excess capacity (or other available capacity) earns an amount FE as foreign exchange.

[5]Currently, the private sector accounts for 82% of outpatient visits, 58% of inpatient expenditure, and 40% of births in institutions. As per an estimate private hospitals in India earned Rs. 62,000 crore in fiscal year 2006 and revenues from the sector are expected to rise up to Rs. 130,000 crore in 2012, which represents an annual revenue growth rate of about 19% a year. As per NSSO estimates between 1995–96 and 2004, the utilization of government sources of treatment (including public hospitals, PHC/CHC, public dispensaries, ESI doctors, etc.) increased from 19% to 22% in rural India and declined from 20% to 19% in urban India. For hospitalized treatment, the decline in utilization of government sources was from 43.8% to 41.7% in rural areas and from 43% to 38.2% in urban areas.(GoI, 2006)The inadequacies in the public health sector has also stunted its growth and tarnished its potential of being a product that could be offered on an international market.

The net loss will be positive or negative depending upon if $L \geq$ or $<FE$ for a hospital H_i

In case FE>L

=>FE-L>0.

If we restrict to corporate hospital C_H, for a corporate hospital i we can write $FEC_{Hi}-LC_{Hi}>0$

Since most of medical tourism is for high tech surgery or high tech procedure under medical tourism, C_{Hi} may denote such hospitals and thus

we can write $\sum_{Chi=1}^{n}(FE-L)>0$.....(1)

Thus, relation (1) provides criteria to reckon the social gain due to decrease in losses owing to better utilisation of idle invested capacity in corporate hospitals in a particular specialty. This social gain criteria of course satisfies normal profit maximisation criteria for a private hospital, i.e, $\sum px_i-c_i>N_P$, where N_P represents normal profit margins under competitive situation for the hospital industry and the procedure.

Thus without regulation of this social gain the cost to society is:

1) As explained later in Table I, this may lead to an increase in monopoly power of certain private corporate hospital (say ΔMP_H)

2) loss of opportunity to poor patients who could have been treated with these resources which led to profits to corporate sector hospital due to medical tourism(say ΔLOP_{MT}) (see , for instance, Purohit, 2009, p.73) and

3) loss of opportunity to poor patients due to invested idle resources in unutilized specialized care (say ΔLOP_{WMT1}) (Purohit, 2009, p. 72)

Thus, in view of above assumptions 1) to 3), net loss to the poor will depend upon $\Delta LOP_{MT}+\Delta MP_H >\Delta LOP_{WMT1}$..... (2)

Now suppose that this medical procedure is being utilized by a citizen of other country thus implying $\Delta LOP_{MT} >0$ and ΔMP_H is also ≥ 0 or >0 depending upon a hospital's location/ relative position in the overall hospital industry in that particular specialty.

Suppose ΔMP_H is also <0, signifying a change in relative position of that hospital vis- a- vis other hospitals in other country with same specialty working with lower cost and thus attracting the patients there as medical tourist. This in turn would mean with global mobility and insurance to upper middle Indian income group some outgo of Indian patients to other country where they pay a certain amount as foreign exchange for treatment say ΔF_{OT}. Thus discouraging medical tourism would mean:

$\Delta F_{OT} + LOP_{MT} + \Delta MP_H = LOP_{WMT2}$ .....(3)

Provided here the decline in monopoly power of hospital is positive.

Thus by discouraging medical tourism loss to the poor patients would be given by a difference of relationship expressed by (2) and (3).

By contrast if through some regulation an amount "t" is taxed away by the government or a regulatory authority, the gain to the society in terms of additional poor patients being treated would be t(RHS of (2)).

This can be noticed that

$\Delta LOP_{MT}+\Delta MP_H >\Delta LOP_{WMT1}$

Now total loss to poor=1= $\Delta LOP_{MT} + \Delta LOP_{WMT1}$

- ⇨ $\Delta LOP_{WMT1} = 1-\Delta LOP_{MT}$

  Substituting this in (2) we get

  $\Delta LOP_{MT}+\Delta MP_H > 1-\Delta LOP_{MT}$

  $2\Delta LOP_{MT} +\Delta MP_H>1$

  $2\Delta LOP_{MT} +\Delta MP_{H=} 1+k$

  If $k>0$

- ⇨ $\Delta LOP_{MT} =\{ (1+k)-\Delta MP_H\}/2$

As long as poor is already not getting treatment in the hospital with medical tourism, the loss to patient will seem to be decreasing as there is an increase in monopoly power of the hospital

If k=0

⇨ $2\Delta LOP_{MT} = 1 - \Delta MP_H$

⇨ $2\Delta LOP_{MT} = (½)(1-\Delta MP_H)$

In both the cases it will help the hospital to grow in dominance without being significantly noticed by the society.

Thus it would be beneficial to poor patients as long as in $t(\Delta LOP_{MT}+\Delta MP_H) > \Delta F_{OT} + LOP_{MT} + \Delta MP_H$

Using relation (1) it would presume $\sum_{Chi=1}^{n}(FE-L)>0$

In terms of diagram, this exposition of tax incidence is depicted in Annexure I.

The situation, at present, in the Indian medical tourism industry is more or less like monopolies of certain group of hospitals which can be observed from the Table I below.

Table I: Major Players in Indian Medical Tourism Industry

	No. of Beds	Turnover (Rs. Millions)	%age of Revenues from International Patients	Major International Markets
Escorts	326	2180	11.9	SAARC, CIS, East African Countries, Afghanistan
Apollo	1500	2010	15	Middle East
Indraprastha-Apollo	650	1650	7.3	Nepal, Bangladesh, Sri Lanka, Gulf and Africa
Hinduja	351	1350	3	African and SAARC Countries
Jaslok	376	1080	10	USA, Japan, Middle East and African Countries

Source: Kumar, 2010.

The power of the monopoly of these groups, if anything, is likely to grow in future. This is indicated as the opportunities it has provided for potential investors. This sector has attracted US$ 379 million in 2006 - 6.3 per cent of the total private equity (PE) investment of US$ 5.93 billion. These groups are indeed heading for major expansion plans. For instance, Apollo Hospitals group plans to invest about US$ 235.69 million in the next 18 months to set up 15 hospitals in tier-II and tier-III cities in India. Likewise, Fortis Healthcare Ltd will add 28 hospitals to its 12-hospital chain by 2012. George Soros's fund Quantum and BlueRidge bought 10 per cent in Fortis Healthcare. Another group like Manipal Health Systems raised over US$ 20 million equity from IDFC Private Equity Fund. Bangalore-based HealthCare Global Enterprises raised over US$ 10 million in equity from IDFC. Yet another group, namely, Metropolis Health Services, a diagnostic chain, raised over US$ 8 million in equity from ICICI Venture. Investment firms Apax Partners, IFC and Trinity Capital have invested over US$ 200 million in hospital firms. Global Hospitals in Hyderabad, which started as a 150-bed facility is to invest close to US$ 178 million in a couple of years to set up hospitals in other metropolitan cities. Wockhardt Hospitals is planning to set up 14 super-specialty hospitals across the country over the next two years, which could entail an investment of up to US$ 152 million. Apollo Hospitals is planning to expand by setting up 50 hospitals across the country, including many in tier-II cities. It will invest US$ 5-9 million in each of the facilities. The monopoly power of these hospitals or hospital groups is further assured through accreditation from international agencies worldwide. Five hospitals in India -- Indraprastha Apollo Hospital (New Delhi), Apollo Hospital (Chennai), Apollo Hospital (Hyderabad), Wockhardt Hospital (Mumbai) and Shroff Eye Hospital (Mumbai) -- have been accredited by the leading healthcare accreditation agency namely Joint Commission International (JCI) in the United States. Delhi-based Escorts Hospital has been accredited by the British Standards Institute. Indian credit rating agency CRISIL has assigned a grade 'A' rating to super specialty hospitals like

Escorts and multi specialty hospitals like Apollo. Wockhardt Hospital has made an exclusive association with Harvard Medical International. Max Healthcare has collaboration with Singapore General Hospital for clinical practice, research and training.

The expansion plan of some of these groups is notable from their medical city projects which are presented in the Table II below.

Table II: Medical City Projects of Selected Hospital Groups

Health City	No. of beds	Area (acres)	Investment (US$ Million)
Dr. Naresh Trehan's MediCity , Gurgaon	1,600	93	293
Fortis MediCity, Gurgaon	600-800	NA	293
Fortis MediCity, Lucknow	800	52	122 - 195
Apollo Health City, Hyderabad	700	33	243
Nagpur Health City, Nagpur	2,000	100	N.A.
Chennai Health City, Chennai by Global Group	1,000	46	245
Bengal Health City Near Durgapur	50000	800	487
Narayana Health City, Bangalore	5,000	100	488

Source: The Economic Times, Realty plus, July 2007

In the year 2007, this kind of expansion has been backed by private equity (PE) investments. This is obvious from the figures in the Table III below.

Table III: Major PE Investments - 2007

Company	Fund	Investment
Max India	International Finance Corporation	$69.77 million (Rs 280 crore)
Apollo Hospitals	Apax Partners	$104 million (Rs 415 crore)
Sahyadri Hospitals	ICICI Ventures	$35 million (Rs 140 crore).
Fortis Healthcare	Trinity Capital	$31.4 million (Rs 125 crore)

Source: http://www.indiape.com/2008/07/

Thus in the decade of 2001 - 2011 corporate hospitals have enhanced their monopoly position by economies of scale in their operations. Most of the corporate hospitals have focused on networking and a wider presence across the country combined with vertical integration to cover the entire spectrum of services. Major players have large expansion plans. Even at present, the Apollo hospitals network includes about 26 hospitals while Fortis Healthcare runs 13 hospitals and 16 satellite centers and Wockhardt has 12 hospitals. Emphasis is also being laid on of medical cities and 'hospotel.' While the former are mainly to utilize the opportunity of medical value travel by encompassing all the possible healthcare services at a single location, the later (i.e., hospotels) include hotels within the hospital campuses.

All this monopoly expansion is funded from innovative financing options like joint ventures, franchisees or infusion of funds through Private Equity (PE), financial institutions and through FDI routes[6].

[6] In fact, private equity firms like Global Healthcare Investments and solutions (GHIS), ICICI ventures (through I-Ven Medicare) and evolvence India Life Sciences Fund have established India specific healthcare funds amounting to $500 million, $250 million and $150 million respectively. Even, Bluewater International Investment aims at investing Rs 500 crore for a multi-specialty hospital set-up in India. Ajay Piramal Group, one of the leading players in the Indian pharmaceutical market has launched a PE fund of $200 million focusing on the Indian healthcare market. The other PE firms focussing on the sector include Apax Partners, Chrys Capital, Trinity Capital, IFC, George Soros, Group Limagrain, etc. Foreign Direct Investments (FDI) in the hospitals and diagnostic centre segment has reached a new high in 2010 with total cumulative FDI inflow crossing Rs 35, 544.34 million. This may be a small but significant step for the healthcare sector(Neelam, 2010).

Utility Maximisation of Public Health Decision Maker

Let us assume that a public health policy maker maximizes a utility function represented as:

U= PTg +PTp+ PTpc

Where PTg=Patients treated in Government set up

PTp= Patients treated in private hospital

PTpc= Patients treated in private corporate hospital

This is subject to a budget constraint presented by

TExH= GEx+GExmtc+Pvtex

Where TExH= Total Expenditure on hospital care

GEx= Government expenditure on hospital care through the budget

GExmtc=Government Expenditure through monopoly tax on corporate hospital sector

Pvtex= Private out of pocket expenses on hospital care

If n_1= No. of patients treated through GEx.

n_2= No. of patients treated through Pvtex.

n_3= No. of patients treated through tax on private corporate hospitals.

Thus we have U= n_1 GEx + n_2Pvtex+ n_3GExpc

Forming Langrange function

L= n_1 GEx + n_2Pvtex+ n_3GExpc –λ(TExH-GEx-GExmtc-Pvtex)

Using GExmtc=GEx(tPC)=tGExpc

L= n_1 GEx + n_2Pvtex+ n_3GExpc –λ(TExH-GEx- tGExpc -Pvtex)

Setting first order derivative equal to zero we get:

$\partial L/\partial GEx=n_1+\lambda=0$……(a)

$\partial L/\partial Pvtex=n_2+\lambda=0$……..(b)

$\partial L/\partial GExpc=n_3+\lambda t=0$……(c)

We get : $\lambda=n_3/t= n_{1=} n_2$

- ⇨ $n_3/ n_1=t$
- ⇨ tax collections will increase as additional percentage of patients (relative to government hospitals) are added to the treatment through corporate hospitals.

However, this is based on the assumption that number of treatments has an average cost figure known to us. In reality, each treatment may not be the same in terms of cost. Thus, exact addition to the number of patients treated through this enhanced revenue by taxation may require a separate calculation for each specific disease classification or DRGs. Nonetheless, this illustration provides an emphasis that medical tourism is necessarily welfare oriented given that:

1) it adds to the comparative advantage of a country vis a vis other countries

2) it utilizes excess capacity of corporate hospitals leading to a better allocation or optimal utilization of invested resources in the hospital sector

3) with monopoly taxation it provides another source of revenue and treatment avenue to additional poor patients.

Impact on Rural Manpower/ Public Health System Manpower

It is contended that medical tourism will divert away manpower to corporate hospitals from the public health system particularly rural areas where it is already scarce. We suggest that it might not be the case.

Let total health manpower in the country be

Thm=Rhm+Uhm

Thm=Rhm+Uhm+Uhmc

Where Thm=Total Health Manpower

Rhm=Health Manpower in Rural Area

Uhm= Health Manpower in Urban Area

Uhmc= Corporate Hospitals in Urban Areas

Any increase in Uhmc would be diverted either from Uhm(more likely) or from Rhm.

Let n_1 be the proportion diverted from Uhm

Let n_2 be the proportion diverted from Rhm

Thus $Rhm_1=Rhm-n_1Uhm-n_2Rhm=(1-n_2)Rhm-n_1Uhm$

Now if $n_2=0 \Rightarrow Rhm_1=Rhm-n_1Uhm$

If $n_1=0 \Rightarrow Rhm_1=(1-n_2)Rhm$

If no diversion $\Rightarrow n_1= n_2=0 \Rightarrow$ Rhm1=Rhm

If corporate hospitals have excess capacity of capital investment it would require additional staff in case medical tourism provides utilization of it.

Now impact on medical manpower in either of rural or urban public health system will be felt through medical tourism only if there is a significant change in utilization of medical equipment/ diagnostics in corporate hospitals. Thus any appreciable impact on diversion of manpower will be realized only if this diversion is exceeding existing and available surplus manpower in either of the rural or urban areas.

Let this surplus of manpower not willing to work either in rural or urban health system be n_3. This implies that as long as n_3>=ARmch(or additional requirement of manpower in corporate hospital), $n_1= n_2=0$

In case ARmch> n_3 , there is likelihood of manpower being diverted , i.e., $n_1$or/and $n_2>0$

In order for this to happen medical tourism has to grow to an extent where ARmch>=n_3

Given the initial phase of medical tourism, as per various estimates, the growth in medical tourism will not be possible beyond the threshold level of additional manpower requirement n_3 if it can maintain its relative cost advantage by international competition with other countries dealing in medical tourism through better utilization of existing services including manpower. Thus attracting manpower from public health setup (rural or urban) may not be an avowed objective which could minimize cost of manpower employment. By the time (say a decade or two) the threshold level where ARmch>=n_3, the criteria of lowering cost will set in. This would mean any increase in overall employment in corporate hospital through diversion of public health manpower is only a remote possibility only.

By contrast, if ARmch $\rightarrow$ n_3, it will help only to utilize the unemployed medical manpower which is otherwise surplus owing to their unwillingness to work in rural or urban public health care setups probably due to location and other disadvantages of infrastructure[7].

Conclusion

Our analysis suggests that contrary to the much publicized view, medical tourism can be useful both for corporate hospitals maintaining the comparative cost advantage in the global medical treatment and for the government to help the treatment of additional poor patients through taxing the corporate hospital monopolies. Besides we also suggest that with the growing gap in manpower demand and supply, the apprehension of diverting manpower from public health system is rather misplaced. Our view is that medical tourism may improve employment venues for voluntary unemployed medical manpower who actually avoid rural based jobs due to lack of adequate facilities and proper working conditions

[7] This kind of voluntary unemployment may continue despite an estimated increasing demand-supply gap in medical manpower. This is presented in Figure 2 in Annexure II.

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Annexure I

As depicted in Figure1 below, presuming an underlying situation of monopoly scenario, the corporate hospital has the power to manipulate the price through its control over supply. If a per unit tax on a service procedure under medical tourism is levied it might be shifted to consumers. However, in the case of lump sum tax, this may be borne by the monopolist corporate hospital.

In Fig. 1, the vertical axis represents total revenue and total cost. Total cost curve starts from F, for OF has been assumed as the total fixed cost. The maximum profit before tax is RC at throughput OQ. The lump sum tax levied is FF_1 and this amount will have to be paid by the monopoly firm irrespective of the quantity it happens to produce. In such a case the best throughput will still be OQ because RC_1 will be the highest monopoly net revenue after the tax has been paid off. This means that there is no change in price or quantity and the money burden is borne by the monopolist himself. Theoretically, the government can impose a lump sum tax of the value of FF_2 and remove the surplus profits of the monopoly completely without causing any change in price and output. In the present situation using this amount of tax (FF_1), extra poor patients could be treated through government expenditure[8].

[8] Under duopoly and oligopoly, price determination is the work of the price leader. While there may be many corporate hospitals in oligopoly situation, only one or two will act as price leader. A tax which influences the cost of production of the price leader may be shifted unless demand happens to be highly elastic. On the other hand, a tax which influences the cost curves of only small corporate hospitals may not be so easily shifted. The smaller ones cannot influence the price as they have to follow the price determined by the price leader, and therefore, will have to accept the tax burden themselves. If the tax is a small one and if it taxes

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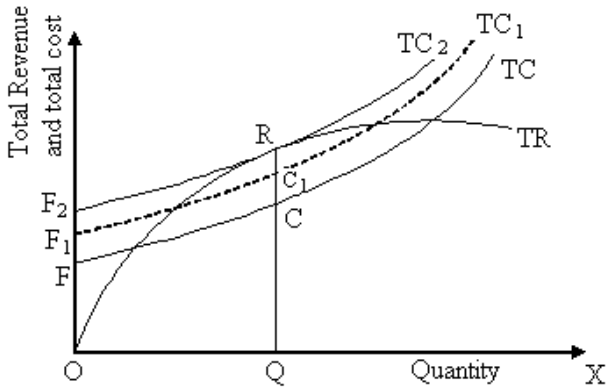

Fig. 1: Taxing Corporate Monopoly Hospitals under Medical Tourism

Annexure II

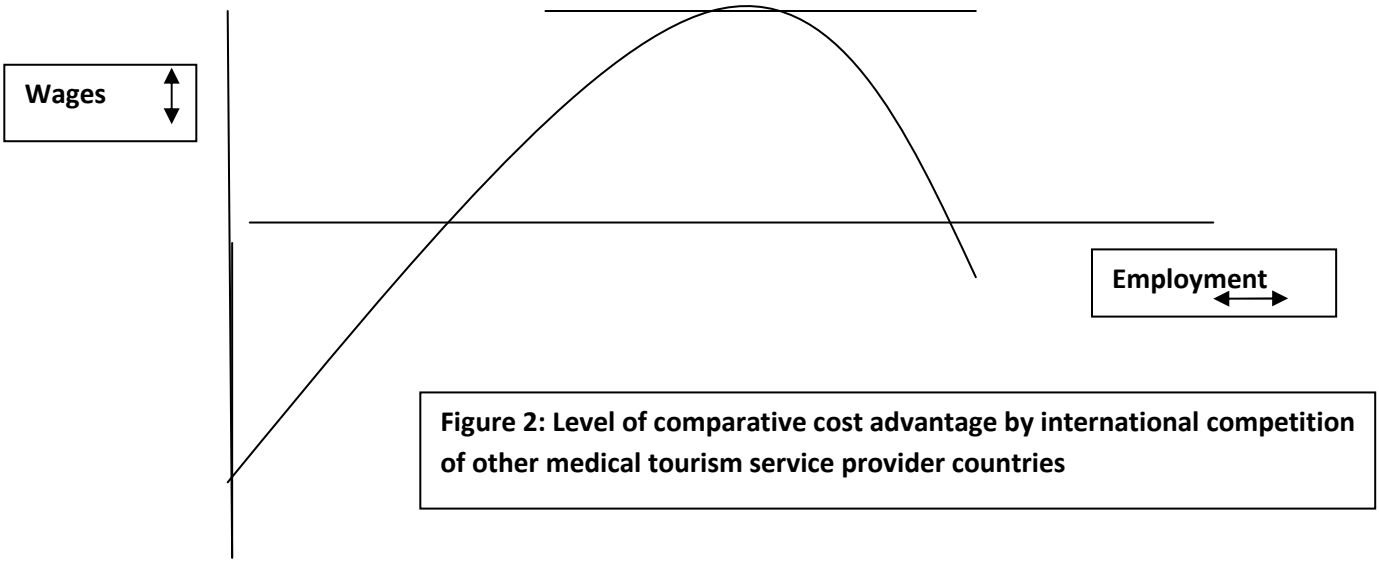

Figure 2: Level of comparative cost advantage by international competition of other medical tourism service provider countries

away only a part of the super-normal profits of these hospitals, the tax will undoubtedly be borne by these hospitals without much difficulty. But if the tax removes much of the profits, then the burden will be shifted to the consumer in the long run through compulsory withdrawal of these hospitals.

Exploring the Consumer Attitude towards Sustainable Food Consumption in India- The Behavior Gap

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ABSTRACT

In the present competitive world, the sustainable food products are getting special attention from the government due to burning issues of food safety and environment protection. However, in a consumer driven economy the final acceptance about any good or service has to come from the side of the consumer. In this context, the present study attempts to find out the behavioral gap of the consumers. The study findings suggest that the consumers favor the sustainable food products but their actual buying behavior is not supporting their claim. This gap persists because of several attributes and among those; price emerges out as the most affecting attribute followed by taste and trust.

Key Words: Sustainable food products, t-test, correlation analysis, price, taste, trust, consumer.

Introduction

Despite of all the food safety measures taken by the government in India for the common man general public are still experiencing the problem of adequate food for mouth. India is still an under developing country and we can say that these are the characteristics of under develop country. But Jensen and Sandoe, (2002), had found in their study that even in Europe, general public seems to have lost their confidence in food safety in the wake of the series of crises within the agro food system of Europe. These findings have raised an issue for sustainable production and consumption. Sustainability in the food consumption is based on consumer's decision making process of purchase. Sustainability in the food consumption pattern includes social responsibility of consumers like animal welfare, environment etc. Like for any other product in the market, consumer acceptance is also a vital factor for the success of sustainable products. The consumers segment buying the ethical or sustainable products consciously, like organic, animal friendly or fair trade, is increasing as the study by Strong, (1996) and Crane, (2001) indicated. However, consumption of everyday consumption goods is heavily driven by habit, convenience, practice and "individual responses to social and institutional norms" (SDC, 2003) further more these are likely to be resistant to change. Yet, these complexity and diversity of the consumers' motivations involved such means that in reality there is a scope for considerable change. The tendency towards reflexivity within a post-modern society is an important driver for change, particularly with the respect to sustainability concerns, because society actively and directly reflects upon existing cultural norms in the society. This collective cultural appraisal is further transferred to the level of the individuals through discourse narrative (SDC, 2003). The 'reflexive consumer' notion refers to a consumer who is not necessarily a social activist, but he seeks to make his own personal risk assessment (e.g. Dupuis, 2000). The period of globalization has stressed this tendency, which has further distanced the individual consumer from the environmental and social context of the commodities they are purchasing. The process of globalization has also reduced the capability of democratic governments to exercise successful control of the risks involved (Kirwan et al., 2003). Furthermore, in the present decade, the ethical consumer seems to perceive a more direct link between social issues itself and what is consumed. This type of consumerism is also extends to human rights, labour working conditions, and animal welfare apart from incorporating environmental issues (Tallontire et al., 2001). In other words the general trend shows that the ethical consumers are feeling more responsibility towards social environment and are expressing these feelings by means of their buying behavior. Dupuis, (2000) found that food is a particularly important focal point for reflexive consumers, because food consumption is a negotiation matter about what a person will, and will not consume for his/her body.

Enteleca, (2001) argued that consumers hardly ever seem to make the relationship between the food they eat and the wider environment in which it is produced, specifically in relation to the countryside. Likewise, research conducted by Institute of Grocery Distribution found that few people consider the impact of what they decide to buy anything usually making minimum connections between the food they buy and issues relating to the environment (animal welfare and fair trade). Moreover, it seems that even where consumers are interested in production issues; this will not necessarily have an impact on what they buy (IGD, 2002b). All these trends argue that many of consumers may not be open to sustainable consumption. However, in recent years ethical issues have got prominence among consumers. Mintel (2001a) found that in the present world, consumers are becoming vegetarian or willing to pay more for organic products, and less willing to boycott products from certain countries. Robinson and Smith, (2002) argued that a large number of consumers are not quite confident in their capacity to purchase sustainable foods from the markets. Moreover, buying from local markets has become an ethical issue as it may provide acknowledgements to local products to be eco-friendly, animal welfare, good for local community or economy (Mintel, 2003). The majority of consumers are ready to try local foods, but this was typically conditional upon it being measured against issues of price, convenience, accessibility and perceived quality (Weatherall et al., 2003).

Now, in the context of present competitive market, the most important question is related to the extent of actual buying decision of consumers related to their interests and buying habits. MacGillivray, (2000) found that most of the ethical labeling initiatives such as organic food, legal logged word, products free form child labor, and fair-trade products often have market shares of less than one percent. Only a small percentage of the consumers are taking ethical labels into account (Dickson, 2001). The reason for this low ethical labeling may be due to the attitude-behavior gap that is attitudes alone are often a poor predictor of marketplace behavior (Ajzen, 2001). The logic for the difference between attitude and behavior may be considered that the ethical criterion is just not taken into account and that respondents generally furnish socially desirable answers. Another potential explanation suggested by Carrigan and Attalla, (2001) is that price, quality; convenience and brand familiarity are still the most important decision variables whereas, the ethical factors are only taken into account by a small number of consumers. Even though interest of consumers about sustainable products may be growing, sustainable food markets remain niche markets for attracting consumers with explicit profiles. In general, the ethical consumer is a middle aged person with a higher income, who is above-average educated, with a esteemed occupation and who is well-informed (Carrigan and Attalla, 2001; Maignan and Ferrel, 2001). An ethical consumer can be identified by stressing on the importance of different variables like; relevant attitudes, behavioral and personality characteristics (Roberts, 1996).

Even after many studies in the context of barriers and consumer profiles, still there exists a huge gap in comprehensive understanding of consumer decision-making towards sustainable food consumption. Therefore, the purpose of the current study is two fold:

1. To investigate the attitude – behavior gap that often occurs,
2. To find, which factors influence the consumer decision-making process towards sustainable food?

Barriers to Sustainable Food Consumption

Sustainable purchases can be hindered because of personal as well as contextual factors. Research on past literature suggests that there exist three key barriers for sustainable consumption such as price, aloofness between production and consumption, and perceived availability of sustainable products. Latest research shows that fifty two percent of consumers were interested in purchasing earth-sustainable foods, but did not purchase those foods outstanding to the perceived barriers of lack of availability, price, and inconvenience (Robinson and Smith, 2002). The price of sustainable products is perceived as being too high and frequently causes a negative attitude (De Pelsmacker et al., 2003). For example, Thompson and Kidwell (1998) argued that the average price premiums for organic products ranged from 40% to as high as 175% in the stores, whereas much willingness to pay

studies have concerted on premiums from 5% to 25% above conventional prices. Yet when a consumer is capable to pay for sustainable food products, there is frequently inadequate information to persuade them that the extra disbursement is worth it.

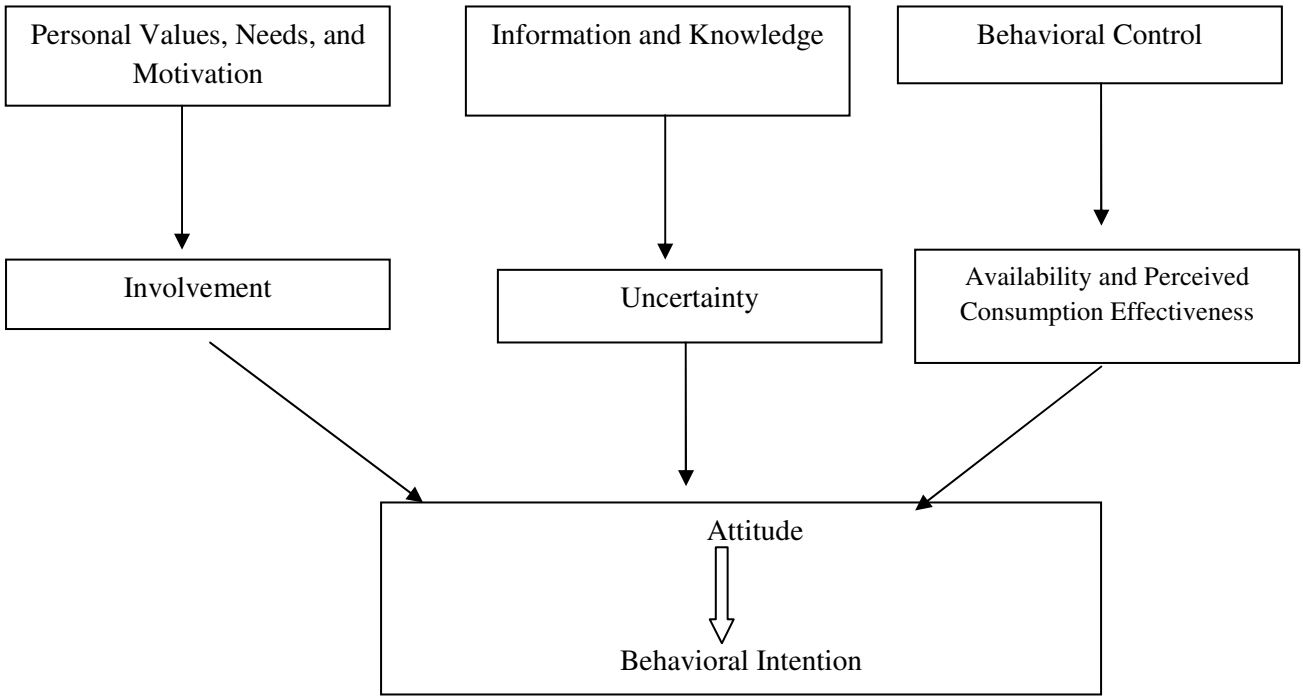
A second barrier is the aloofness between production and consumption. Dickson, (2001) suggests that this barrier comes into picture due to incomplete knowledge of consumers about agriculture and its production processes and a lack of insight in the implications of food buying decisions on the lower levels of the food supply chain. Few respondents intentionally make association between the foods they eat. Some merely do not mind about the beginning of the food they buy, but many might do so if they would have more knowledge and understanding of the concerns involved in the process. Deficient information does not only distress the agricultural and food production process, but in many countries there is also a dearth of knowledge and perplexity on the concept sustainability and the corresponding logos and labeling issues. Verbeke and Ward, (2004) argues that logos and labeling are often baffling and insufficient for consumers, leading many of them to lose awareness in the underlying messages.

The third major barrier is related to the perceived availability of sustainable products. This dilemma is related to the scarcity of local food shops such as farmers' markets (which often lack the regularity, and convenience demanded by consumers), the limited and irregular presence of sustainable products in supermarkets as this is the major purchasing point of many consumers (Vannoppen et al., 2002). Moreover, ethical products are repeatedly not really visible in the shop and/or inefficiently promoted (De Pelsmacker et al., 2003). On the other hand, supplying sustainable food products through supermarkets should not prohibit improving consumer access to sustainable products through more localized outlets.

Theoretical Framework

The current study is based on the consumer behavior model developed by Jager, (2000). With the help of this model, authors attempt to examine the consumer behavior towards sustainable food products.

Figure 1: Conceptual Framework to Examine Consumer Behavior towards Sustainable Food Products



Source: Adapted from Consumer Behavior model by Jager, (2000).

The three main determinants of consumer behavior are i) Values, needs and motivations, ii) Information and knowledge, and iii) Behavioral control with reference to with sustainable consumption. These determinants of consumer behavior have an indirect

impact on the decision making process of the consumer, through involvement, uncertainty, and availability and perceived consumer effectiveness, respectively.

Decision-Making: Attitude and Consumption Behavior

To stimulate sustainable consumption, a positive attitude of consumers is essentially required. In the literature, many studies in different contexts have been conducted to get clarity about the concept of attitudes of consumers towards sustainability and sustainable consumption behavior. For example: De Pelsmacker et al., 2003); Gordier, (2003); Tanner and Kast, (2003); Bissonette and Contento, (2001); Chan, (2001); Verbeke and Viaene, (1999); Shrum et al., (1995); Shamdasani et al., (1993). Generally speaking, approximately thirty percent of the consumers have got positive attitude towards sustainable products. Perception of sustainable products is made generally on the basis of taste, quality, safety, and freshness, contribution to regional economies and identity, impact on human health and on the environment. On the other hand, more negative attitude originates because of facts like; price, convenience, appearance, and conservation.

Consumer research literature propounds that majority of the consumers are willing to pay more for sustainable products in comparison to small number of consumers, who are really willing to pay a premium price for sustainable products. Therefore, this positive attitude of consumers does not persuade them to support animal welfare or environmental improvement campaigns.

Grunert and Juhl (1995) concluded that a positive attitude does not necessarily lead to the desired behavior in case of organic products. Mintel (2001b) suggested that seventy one percent of the adult population feel and think positively about sustainable, organic foods and are now potential buyers of sustainable organic foods.

A study on purchase intentions towards sustainable foods shows that psychosocial variables in comparison to demographic variables like attitudes, beliefs, perceived behavioral control and subjective norms independently envisage purchase intention for sustainable products (Robinson and Smith, 2002). Moreover, Minteer et al., (2004) argue that situational context influences influence choices more than environmental ethics.

Personal Values, Needs, Motivations and Involvement

Human values are considered as comparatively stable beliefs about the personal or social attractiveness of certain behavior and modes of existence. Values exhibit the objectives that motivate people and suitable ways to attain these objectives. Engel et al., (1986) argued that values can play an important role in the consumer decision process in terms of product and brand choice. For instance, Vitell et al., (2001) propounded that consumers are more guided by values than by consequences when making ethical decisions.

There exists an ample range of motivations to decide for some kind of sustainable products and these motivations are diverse as per the personal values of the consumers. Consumers do not always buy sustainable products as a result of environmental concern or to benefit the community. Boulstridge and Carrigan, (2000) argued that the decision to buy sustainable products is often an outcome of the need to save money and time, to give priority to health, to distinguish from others, to feel part of a social group, to fulfill the need, to try out new technologies or to look for the most easy and comfortable way of living.

Verbeke and Vackier, (2004) found that the involvement influences the comprehensiveness of information search, the extent of the decision-making process, construction of beliefs, attitudes and intentions as well as behavioral outcomes such as variety seeking behavior, brand-switching behavior, brand-commitment or loyalty, frequency of product usage and shopping enjoyment.

Vermeir and Verbeke (2004) connected ethical or sustainable behavior to personal values. The corroboration of an underlying influence between some values like universalism to a sustainable consumption pattern implies that promoting the accurate values through socialization and national institutions can smooth the progress of the achievement of the long-run target of sustainable consumption (Thogersen, 2001). On the other hand, author argues that in the short run the level of sustainable behavior depends much more on more specific factors, like; habits, specific attitudes and preferences and on opportunities to connect in sustainable consumption.

Information, Knowledge and Uncertainty

In the decision process, admittance to clear and reliable information on the products is an imperative factor. The profits of sustainable products are often scantily communicated to consumers, so that they are not capable to make well-versed purchasing decisions in accord with their budget and/or ethics. Product labeling can be considered as a valuable tool for providing information. Though, Verbeke and Viaene (1999) found a large disparity between knowledge and perception of labels and the exact labeled beef features. Moreover, research about sustainable fruit labels (Vannoppen et al., 2002), and the awareness of sustainable labels in general and a specific fair-trade, organic label (Gordier, 2003) concluded that both unaided and aided awareness of students about sustainable labels was very low. Past literature supports the notion that lack of transparent and factual information yields uncertainty at the consumer level.

Behavioral Control, Availability and Perceived Consumer Effectiveness

The third prospective determinant of consumer decision-making process is the availability of sustainable products, which is interrelated to consumer's behavioral control. Availability means the ease or difficulty to obtain or consume a specific product. Even though the motivation to consume sustainable products is high, but because of low availability, it may be impossible to consume. Behavioral control refers to the fact that whether the consumer can easily consume a specific product or whether its consumption is difficult or impossible. The availability of sustainable products is only one facet that has an impact on consumers' behavioral control with respect to sustainable consumption. Another facet related to behavioral control is the perceived consumer effectiveness, which is the degree to which the consumer believes that his personal efforts can contribute towards the solution of a problem. Roberts (1996) argues that in order to motivate behavioral changes, consumers must be persuaded that their behavior has an influence on the environment.

Research Methodology

Research Design

To gain a better insight in sustainable consumption, a survey with measurement of attitudes and behavior towards sustainable food products as well as some Price, Availability, Perishability, Trust, Information, and Taste related to sustainable products was conducted.

Statistical Tools and Techniques

To meet the objectives of present study, we used different statistical tools and techniques like; Weighted Average Scores, t-test and correlation analysis.

Data Collection

Primary data has been collected by the field survey method with the help of structured questionnaire containing eight questions in all. The first part of the questionnaire contains two questions; one is related to purchasing of sustainable food products, and another is related about perception of consumers about sustainable food products. These two questions were measured with the help of five point Likert's scale. In the second part of the questionnaire, a total of six questions were asked. These six questions are related to attributes of sustainable food products. These six attributes are Price, Availability, Perishability, Trust, Information, and Taste. These six attributes were measured with the help of constant sum scale. Target respondents were provided briefing about the scale and they were asked to distribute the hundred points among these six study attributes according to their requirements.

Results

Results of the study are presented in tabulated form to meet the objectives of the study.

Table I : T-Test For First Two Questions: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Actual Purchase	4.3558	104	.69559	.06821
	Perception	2.6442	104	.53821	.05278

Table II: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Actual Purchase & Perception	104	-.074	.458

Table III: Paired Samples t-test

		Paired Differences					t-Value	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Actual Purchase - Perception	1.71154	.91028	.08926	1.53451	1.88856	19.175	103	.000

Weighted Average Scores for Six Attributes

Table IV: Weighted Average Score

Attributes	**Price**	**Availability**	**Perishability**	**Trust**	**Information**	**Taste**
Weighted Average Score	34.31	12.27	7.05	15.13	12.92	22.32

Table V: 2ND T-Test Paired Sample T-Test to Compare the Means of Attributes Namely; Information and Availability

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Information	.1180	104	.06084	.00597
	Availability	.1242	104	.05947	.00583

Table VI: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Information & Availability	104	.159	.108

Table VII: Paired Samples t- test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Information - Availability	-.00625	.07805	.00765	-.02143	.00893	-.817	103	.416

Discussion

In the first part of the questionnaire, we asked two questions with the intention of getting the perceived behavioral gap about the sustainable food products. The responses of first question; 'I *think, sustainable food products are good'* provide the perceived value of the respondents about the sustainable food products. Whereas the responses of second question; '*I buy sustainable food products'* will provide the actual approach of the respondents on sustainable food products. Table I, II, III represent the results of paired t-test conducted to compare the means of these two questions. It is evident from table III that the means of these two questions are significantly different, providing evidences for the behavioral gap of the consumers about sustainable food products. The insignificant correlation (see table II) between the responses of two questions also supports the claim that the behavioral gap exists in the minds of consumers about sustainable food products.

The second part of the questionnaire is proposed to find out the possible causes for the behavioral gap. The second part contains six attributes of sustainable food products namely; Price, Availability, Perishability, Trust, Information, and Taste. The weighted average scores of these attributes have been provided in table IV. As it is evident from the table, price emerged out as the most influencing attribute for a not buying the sustainable food products followed by taste and trust. Whereas, Perishability is the least affecting attribute for a not buying the sustainable food products, with the average weighted score of 7.05. The average weighted score of availability, and information of the sustainable food products seem close to each other. Therefore to find out the greater influencing attribute among these two, Paired t-tests has been performed and the results of the test have been reported in table V, VI, and VII. Paired t-test results confirm that statistically these two attributes are equally influencing the consumers for not buying the sustainable food products since.

Conclusion

A large number of studies conducted in different contexts exhibit that consumers value the ethical aspects in a product that attitudes are quite favourable, but also that behavioral patterns are not universally consistent with attitudes. The results of the study confirmed the gap between favourable attitude towards sustainable behavior and behavioral intention to purchase sustainable food products. The current study attempted to explore the attitude – behavior gap by analyzing consumer attitudes and their purchase intention for sustainable dairy products in the context of India. Dairy products is a fast moving good, having low involvement in buying decision-making process, and at the same time, this specific good has several properties to which a consumer pays special attention namely; price, availability, Perishability, trust, information, and taste. Moreover, the study examined the impact of individual attributes (that is price, availability, Perishability, trust, information, and taste) on attitudes of customers and intentions towards sustainable food products. The results of the study revealed that price was the attribute which got highest impact on attitudes of customers and intentions towards sustainable food products, followed by taste of the products, then trust about the products. In the results, information, and availability got statistically same impact on attitudes of customers and intentions towards

sustainable food products, and finally Perishability got least impact on attitudes of customers and intentions towards sustainable food products.

Implications of the Study

The findings of the present study yield public policy and marketing recommendations for stimulating sustainable food consumption among the potential consumers in developing country like India who can reasonably be assumed to constitute the major market of sustainable food products in the near future. Individual characteristics like price, taste, trust with respect to sustainability claims and perceived consumer effectiveness have high positive impact on attitude towards buying the products respectively, where as Perishability, information, and availability also got impact on attitudes of consumers, but lower in hierarchy. Moreover, study strongly suggests that policymakers need to focus on the aspect of bridging the gap between perception of the consumers about the sustainable food products and actual buying, so that maximum benefits can be gained for individual as well as for society.

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Impact of Special Industrial Incentives Package in Himachal Pradesh: Managerial Perceptions

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ABSTRACT

This paper aims to examine the managerial perceptions on some selected parameters concerning Special Industrial Incentives Package (SIIP) granted to Himachal Pradesh, one of the eleven special category states eligible for central assistance. Many developing economies use tax holidays to attract investment in industrially backward areas by providing limited period tax exemptions, deferments and reductions for qualified investors. Moving on the same track, Government of India preferred the same as an important fiscal measure for balanced regional development. Results of data analyses reveal that government incentives and concessions have played a key role in attracting investment thereby enhancing employment opportunities despite of non-conducive industrial environment in the study area. Further it was concluded that government incentives and concessions have not proved expected boosters of profitability for the set industrial units thereby reducing the future chances of incentives being a fundamental determinant of attracting investment. The study has implications for governments of industrially backward states as it will help in evaluating investor perceptions pertaining to government incentives and concessions. Evidence of the study is relevant to policymakers designing tax incentives for such states.

Key Words: Special Industrial Incentives Package, Industrial Units, Industrially Backward States, Investment, Profitability

Introduction

Over the past two decades, incentives and concessions are being actively used to attract investment in industrially backward areas. Government of Himachal Pradesh has given top priority to rapid and balanced industrialization with the main objective of creating employment opportunities and economic development on sustainable basis. Lack of basic infrastructure and amenities constraint the state from being an ideal place for investment. Therefore, the central and state government has to give special incentives and concessions to industries for providing a fillip to the industrial development. Special Industrial Incentives Package (SIIP) was granted to the state by Government of India on 7 January 2003. It was affirmed that the industries eligible for such incentives will be environment friendly with potential for local employment generation and use of local resources.

Economic, political and social processes are interwoven inextricably in the course of development. Development economics is sterile without an understanding of the accompanying developmental politics, which involves the interaction of the state with the major factors. At the core of this politico-economic process is the role assigned to industrialisation (Bhaduri and Patkar 2009). Industrialization not only influences the growth of national output and income, but also influences the national life and the social, political and cultural pattern (Sadak 1986). Industrialization should be viewed primarily as means of improving the conditions of work and living standards of downtrodden masses all over the world and not merely as means of producing a wide variety of products by application of modern technology. If this is not kept in mind, efforts to industrialize may leave the lives of majority of people untouched. Thus, industrialization is the result of long term processes of development of industrial activities in a particular region. It brings the benefits of socio-economic transformation and boosts the economic growth of that region (Sharma 2007).

Industrialization influences the growth of national output and income and thus, improves the entire national life by affecting social, economic, political and cultural pattern of society. Industrialization brings more equitable distribution of income between different parts of the world by raising income in depressed areas at a higher rate than in rich areas (Rodan 1943). The impact of industrialization in the development of different infrastructure facilities in Himachal Pradesh has been positive. The process of industrialization has resulted in an increase in number of education imparting facilities, medical facilities, roads network, housing infrastructure, shopping facilities, banking network, insurance facilities, hotel and restaurant, parks and picnic spots and shopping facilities. However, these areas are still lagging behind in respect to higher educational facilities and hence there is a strong need to improve the higher education facilities (Sharma et al 2008). Rana (1988) feels that industrialization of hilly states poses serious

challenges to the planners of industry. Existing system of planning has failed to spread the fruits of industrialization particularly to the hill state like Himachal Pradesh and therefore, need of the hour is to restructure existing center-state relations and suggest an alternative plan for industrializing the state on the basis of specialization, where not only industries based on local raw material should be encouraged but also highly capital intensive industries should be encouraged by taking into consideration the locational advantage.

The special package of incentives granted by the Government of India in January, 2003 was supplemented by the Industrial Policy and Incentive Rules, 2004 of Himachal Pradesh Government which provided more incentives to the potential and existing entrepreneurs in the state such as; tax concessions, concessional rates of electricity, special incentives for establishing industrial units in the backward and tribal areas of the state, incentives for training and development of manpower etc. Public capital subsidies can modify industrial dynamics at local level, in both short and long run, though in the short run, subsidies seem to cause a higher level of indebtedness for firms, which they receive with non-decreasing costs of debt. In the long run, subsidized firms exhibit lower levels of productivity when compared to non-subsidized ones (Roberto et al 2006).

Undoubtedly, Himachal Pradesh is a success story in hill area development but inspite of sincere efforts by the central and state government for boosting its economy; it still remains an economically underdeveloped state. New units mostly set up in the periphery districts are achieving accelerated growth but the growth may not be sustainable in the long run as fiscal concessions are available only for a limited period. Role of incentives in developing industrially backward areas has been the subject of many studies, but managerial perceptions concerning incentives to the state of Himachal Pradesh has never been clearly stated. In this backdrop, present paper is an attempt to analyze the managerial perceptions concerning SIIP apart from knowing the entrepreneurial satisfaction with profitability position and also the reasons for setting industrial units in Himachal Pradesh.

Objectives of the Study

Main objectives of the present paper are**:**

1. To study the managerial perceptions concerning SIIP.
2. To know the reason(s) for setting up of industrial units and examine their sustainability.
3. To critically evaluate the profitability position of industrial units availing incentives.

Hypothesis

1. Industrial units have been set up due to SIIP.
2. SIIP has attracted investment in the area.
3. Units availing incentives comparatively earn more profits.

Research Methodology

Results of the study are based on the information collected through a detailed and exhaustive questionnaire prepared to carry out an in-depth exploratory and empirical level research during the year 2009-10. In the present work, a sample of 131 industrial units availing benefits of SIIP has been selected from different industrial areas of the study state. In order to make the sample representative, proper weightage has been assigned to the units according to their size and product. As far as possible, the researcher has selected the respondents at random but due to practical difficulties, the purposive sampling methodology has also been applied. The chi-square test as a goodness of fit has been used to analyze the magnitude of difference in opinion of the respondents between observed distribution and the expected distribution under the assumption that it is equally distributed on 5-point scale. This test helped to find out whether the distribution of opinion of respondents differs significantly or not. The factor analysis technique (Principal Component Analysis) with varimax rotation was applied to extract the basic factors underlining the observed factors. After ignoring the non-significant correlation, then the orthogonal factors were extracted. Sampling adequacy was measured by the Kaiser-Meyer-Olkin (KMO) statistics. KMO varies from 0 to 1.0 and values closer to 1 are better.

Empirical Results

Setting Up of Units Due to SIIP

Table I indicates that majority of the respondents either agree or strongly agree with the statement of setting up industrial units in Himachal Pradesh because of package. The mean score of aggregate responses is 2.27 with positive skewness of 0.713 and standard deviation of 1.17, which indicates that the distribution of respondents is highly skewed towards lower side of the mean and reflects that majority of the respondents either agree (40.5 percent) or strongly agree (29 percent) with this statement. There are only 22.1 percent respondents who do not agree with the statement. Hence, it can be summed up that majority of the industrialists have set up their units in Himachal Pradesh because of the package of incentives and concessions. The chi-square goodness of fit test also supports the above finding as there is a significant difference in the distribution of opinion of the respondents.

Continuation of Business Operation Even After the Expiry of Incentives

The perception of the respondents reveals that majority want to continue the business operation in Himachal Pradesh even after the expiry of fiscal incentives and concessions as the mean score was found 2.45. Two out of every five (38.2 percent) respondents have been found indifferent as they neither agree nor disagree with the statement, whereas nearly half (47.3 percent) of the respondents either agree or strongly agree with the statement. Positive and small value of skewness (0.360) with standard deviation of 1.18 also supports the indifferent nature of responses towards the statement. The calculated value of chi-square for the test of goodness of fit is highly significant.

Setting Up Industrial Units in Absence of SIIP

The views of respondents regarding setting up the unit in area under study in the absence of the package, as presented in Table I reveals that, half (50.4 percent) of the respondents either disagree or strongly disagree with this statement. The mean score of overall responses is 3.29 with negative skewness of -0.426 and standard deviation of 1.26. The value of chi-square is significant at 5 percent level of significance. Statistical analysis divulges that an overwhelming number of respondents would not have set up their unit in Himachal, if the industrial package was not announced for the state. Maximum concentration of the opinion of respondents is toward the higher side of mean score which clearly shows that package has given impetus to the development of industries in and around the area. So, it can be said that process of industrialization would never have ignited itself in the absence of the package.

State Government Special Package on Expiry of Incentives Presently Availed

The benefits of incentives are available to those industries which are established during the specified period. The central tax sops for industries established or expanded after 2003 and before 2010 are eligible for five year income tax exemption and 10-year excise duty waiver. After incentives to industry expire, respondents expect state government to substitute it by one way or the other. Even the extension of package will not affect the already established units but the extension will be beneficial to new entrants. The perceptions of the respondents on the statement that state government should review its policy after incentives by central government to industries expires, has been presented in Table I. Opinion of a large number of respondents (58.8 percent) fall between strongly agree and agree, whereas only 18.1 percent of the respondents either disagree or strongly disagree with this statement. The respondents expect state government to offer additional incentives after the term of incentives expire. This is evident from the low mean score of 2.39 and the value of skewness (0.612). The highly significant value of chi-square statistically brings out the fact that there is a significant difference in the perceptions of the respondents.

Table I: Perception Regarding Special Industrial Incentives Package (SIIP)

Responses / Variables	Strongly Agree	Agree	Neither Agree nor Disagree	Dis-agree	Strongly Disagree	Mean	Std. Deviation	Skew-ness	Kurtosis	Chi-Square	Asymp. Sig.
Set Up Unit Only Due to Package.	38 (29.0)	53 (40.5)	11 (8.4)	24 (18.3)	5 (3.8)	2.2748	1.17705	.713	-0.586	58.885	.000
Continue Even After the Expiration of the Incentives	38 (29.0)	24 (18.3)	50 (38.2)	10 (7.6)	9 (6.9)	2.4504	1.18460	.360	-0.568	48.427	.000
Set Up Unit even in the Absence of Package	17 (13.0)	17 (13.0)	31 (23.7)	43 (32.8)	23 (17.6)	3.2901	1.26788	-.426	-.818	18.504	.001
Expectations from the State Government to Review its Policy	36 (27.5)	41 (31.3)	30 (22.9)	14 (10.7)	10 (7.6)	2.3969	1.21326	.612	-0.492	28.275	.000
Most of the Industries will not Sustain in the Long Run	22 (16.8)	31 (23.7)	37 (28.2)	24 (18.3)	17 (13.0)	2.8702	1.26732	.133	-.960	9.420	.051
Packages Attract Investment in Underdeveloped Areas	49 (37.4)	46 (35.1)	17 (13.0)	11 (8.4)	8 (6.1)	2.1069	1.17834	1.022	0.214	59.496	.000
Package has Attracted Both Foreign and Domestic Investment	41 (31.3)	38 (29.0)	22 (16.8)	14 (10.7)	16 (12.2)	2.4351	1.35362	.640	-.782	24.000	.000
Employment Opportunities for Locals	65 (49.6)	45 (34.4)	2 (1.5)	19 (14.5)	0 (0.0)	1.8092	1.03116	1.204	.276	70.985	.000
Conducive Environment for Industrial Growth	11 (8.4)	31 (23.7)	29 (22.1)	18 (13.7)	42 (32.1)	3.3740	1.36627	-.135	-1.321	22.092	.000
Package has Breeded Inefficiency and Uncompetitiveness	25 (19.1)	17 (13.0)	31 (23.7)	22 (16.8)	36 (27.5)	3.2061	1.46086	-.200	-1.285	8.504	.075
Threat to the Economy of the State Once the Package Expires	15 (11.5)	27 (20.6)	33 (25.2)	30 (22.9)	26 (19.8)	3.1908	1.28969	-.123	-1.058	7.130	.129
Earn More Profits than Competitors	22 (16.8)	19 (14.5)	22 (16.8)	5 (3.8)	63 (48.1)	3.5191	1.59012	-.420	-1.443	72.168	.000
Competitive Edge	42 (32.1)	42 (32.1)	26 (19.8)	14 (10.7)	7 (5.3)	2.2519	1.17240	.717	-.335	38.809	.000
Expected Returns	27 (20.6)	26 (19.8)	36 (27.5)	15 (11.5)	27 (20.6)	2.9160	1.40350	.151	-1.177	8.504	.075
Satisfied with the Profits	26 (19.8)	13 (9.9)	20 (15.3)	19 (14.5)	53 (40.5)	3.4580	1.57020	-.466	-1.334	37.511	.000
Actually Benefited	40 (30.5)	26 (19.8)	23 (17.6)	23 (17.6)	19 (14.5)	2.6565	1.43993	.293	-1.282	10.031	.040

Source: Primary Probe
Note: Figures in parentheses denote percentages

All these statistical values clearly indicate that a vast majority of the entrepreneurs are of the opinion that the package should be substituted with some other incentives by the state government. So, it is inferred that majority of the industrialists do not want to continue in Himachal Pradesh in the absence of any special incentives.

Sustainability of the Units in Long Run

Two-fifth (40.5 percent) of the respondents either agrees or strongly agrees with the statement that most of the industries in and around the area will not sustain in the long run. Three out of ten (31.3 percent) respondents either disagree or strongly disagree with this statement, whereas 28.2 percent respondents are found indifferent. The opinion of the respondents regarding the long term sustainability of industrial units is positively skewed (0.133) with mean score of 2.87. The aggregate mean score of responses is slightly high from average mean with standard deviation of 1.26 and reflects that the opinion of respondents is distributed more towards disagreement or strongly disagreement responses. Hence, it can be concluded that the chances of industrial units to sustain in long run are remote and industries will retreat from the state as soon as fiscal benefits expire. It will be difficult for the industries to immediately revert back, but slowly and steadily it will happen and after that the status-co will prevail.

Packages Attract Investment in Underdeveloped Areas

Special incentive packages are a good way for attracting investment in underdeveloped areas but these have to be supplemented with rich infrastructural facilities. The opinion of respondents on the statement that the packages of incentives and concessions are a good way of attracting investment in underdeveloped areas as depicted in Table I which reveals that 72.5 percent of the respondents either agree or strongly agree with the statement. Mean score of aggregate responses (2.10) supports the fact that a large number of respondents have given a favourable response to the statement. High positive value of skewness (1.02) and standard deviation (1.17) also support the above findings. The value of chi-square is highly significant. Hence, it can be said that packages of incentives and concessions attract investment in underdeveloped areas.

Beguiled Global Investment

Himachal Pradesh experienced abundant growth in its investment after 2003. The package for industrialization has attracted both domestic as well as foreign investment. Several multi-national corporations have been established, but the share of domestic investment is still substantial regardless of export processing zones declared by the state. Three-fifth (60.3 percent) of the respondents feels that investment has come to the state from both domestic and foreign sources. The mean score of overall responses is 2.43 with positive skewness of 0.640 and standard deviation of 1.35. The value of kurtosis (-0.782) lies in the expected range and value of chi-square is highly significant. The opinion of the respondents is concentrated towards lower side on the five point scale and reflects that majority of the respondents either agree or strongly agree with the statement.

Employment Prospects for Locals

Four out of every five respondents (84 percent) are tilted towards lower side of the mean and have agreement on this statement. The perception of respondents is positively skewed with very low mean score of 1.80 and standard deviation of 1.03. The value of kurtosis is positive and lies in expected range and value of chi-square is highly significant. Statistical analysis reveals the fact that the respondents either agree or strongly agree with the statement and hence, it can be said that employment opportunities for locals have increased with the advent of the package.

Conducive Industrial Environment

Slightly less than half (45.8 percent) of the respondents either disagree or strongly disagree with the statement that Himachal Pradesh provides conducive environment for industrial growth. The outlook of respondents vis-à-vis the statement is negatively skewed (-0.135) with a mean score of 3.37 and kurtosis of -1.32. Chi-square test of goodness of fit shows that there is a significant difference in the opinion of the respondents. It is clear from the statistical analysis that an overwhelming number of respondents are of the view that the environment of industrial growth in the state is not encouraging.

Packages Breed Inefficiency and Incompetency

More than two-fifth (44.3 percent) of the respondents either disagree or strongly disagree with the statement that these kinds of packages have led to creation of inefficiency and uncompetitiveness among industry. High mean score (3.20) with negative skewness (-0.200) and standard deviation of 1.46 implies that majority of the respondents either disagree or strongly disagree with the statement. Therefore, it can be concluded that packages of incentives and concessions do not adversely affect the efficiency and competitiveness of the industries.

Impact on Economy

Two-fifth (42.7 percent) of the respondents either disagree or strongly disagree with the statement that expiry of industrial incentives package will adversely affect the economy of Himachal. This is also reflected from the aggregate mean score of 3.19 and negative skewness of -0.123 with standard deviation of 1.28. A large majority of respondents disagree with this statement as responses are highly concentrated towards higher side of the mean score. Chi-square value depicts that there is no significant difference in the distribution of the opinion of the respondents. In the survey a significant proportion of respondents had a strong feeling that even if the package expires it won't negatively affect the economy of Himachal Pradesh.

Better Profitability

The views of respondents regarding the statement that they earn more profits than their counterparts who have set up their units in other states where incentives and concessions are not available has been exhibited in the Table I. Nearly half (51.9 percent) of the respondents feel that they are not earning more profits than their competitors. The mean score of overall responses is 3.51 with negative skewness of -0.42 and 1.59 value of standard deviation. The value of chi-square goodness of fit is also highly significant. Statistical analysis reveals that the responses for the statement fall between disagreement and strongly disagreement responses. Majority of the respondents also had a strong feeling that setting up the units in Himachal Pradesh was not a good decision as the production and distribution cost are very high in the state. Hence, it can be summed up that due to increased cost of production in Himachal Pradesh, industrialist are not earning more profits than their competitors from other states where even incentives and concessions are not available.

Package Propounded Competitive Edge

Incentives and concessions give competitive edge to industrial units upon their competitors. Most of the industries established in the area under study are promoted by already well established business houses. They have their own market and clientele. Incentives and concessions are complimentary and industries availing them have an upper hand as they tend to lower the cost of production. Overwhelming number (64.2 percent) of respondents either agrees

or strongly agrees with the statement that industrial units in Himachal have a competitive edge upon industries in other states. The mean score of overall responses is low (2.25) with positive skewness of 1.17. Chi-square test of goodness of fit is highly significant. Statistical analysis reflects that the opinion of respondents is distributed more towards agreement or strongly agreement responses. Hence, it is inferred that package of incentives and concessions provide competitive edge to industrial units.

Expected Returns

Net profits of units located in special category states are expected to be high because they are given incentives and concessions by the government which ultimately reduces the cost and is expected to increase the profitability. But, cost of production in such areas is always high because such areas are generally underdeveloped. The mean score of 2.91, skewness of 0.151 and the value of standard deviation of 1.40 depict that the concentration of responses is towards disagreement and strongly disagreement responses. Hence, it can be concluded that entrepreneurs are not earning expected returns on their investments.

Satisfaction Level of Profitability

Profitability of units can be analyzed from quantitative data but satisfaction level towards the profitability position can be judged only on the basis of the opinion of the entrepreneurs, that whether they are satisfied with the profits or not. More than half (55 percent) of respondents are not satisfied with the profitability of their enterprises which indicates that they are not earning sufficient and expected returns on their investments. The main cause of low profitability is high cost of production. Mean score of 3.45 with negative skewness of -0.466 and high standard deviation of 1.57 supports the disagreement of respondents with respect to satisfaction level for profitability. Chi-square value of goodness of fit has been found highly significant. Hence, it is concluded that industrialists are not satisfied with their profits.

Benefits Derived

Industrialists who have established their units in Himachal Pradesh and have fulfilled the conditions imposed by government have certainly been benefited. The perceptions of respondent in this regard reveals mean score of 2.65 with positive skewness and standard deviation of 1.43. The mean score reflects that the responses are slightly skewed towards disagreement or strongly disagreement. Value of chi-square also supports the above findings as there is a significant difference in the distribution of opinion of respondents on five point scale. Thus, it can be concluded that though industrialists have been benefited but the difference between expected benefits and benefits actually derived is quite large.

Factor Analysis of the Managerial Perceptions

Role of SIIP in economic development of the state depends on the interplay of other independent traits that can be best explained by appropriate biometrical tools. As indicated by Table II, Kaiser-Meyer-Olkin measure of sampling adequacy in the present data is 0.612 which reveals adequacy of data. Bartlett's test of sphericity tests the null hypothesis that the correlation matrix is an identity matrix and is significant at 1 percent level. The study under consideration significantly satisfies both the tests.

Table II: KMO and Bartlett's Test

Kaiser- Meyer –Olkin Measure of Sampling Adequacy.	.612
Bartlett's Test of Sphericity Approx. Chi-Square	399.227*
Degree of Freedom	120

Note: Significant at 1 per cent level of significance

Source: Primary Problem

Since it was difficult to conceive 16 variables, (Table III) principal component analysis was employed for the data reduction. The total variance accounted for by each equation is called the eigen value. Table III reveals the factor pattern and summary of principal component analysis of collected data. The Kaiser rule is to drop all components with eigen values under 1.0. Six out of sixteen components have eigen values greater than one and together they account for 63.19 per cent of variation of the original variables.

Table III: Total Variance Explained for the Perception Regarding SIIP

Component	Initial Eigen Values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.973	18.582	18.582	2.973	18.582	18.582	2.699	16.867	16.867
2	1.722	10.762	29.344	1.722	10.762	29.344	1.610	10.063	26.930
3	1.692	10.574	39.918	1.692	10.574	39.918	1.581	9.879	36.809
4	1.368	8.552	48.470	1.368	8.552	48.470	1.514	9.464	46.273
5	1.246	7.787	56.257	1.246	7.787	56.257	1.436	8.974	55.247
6	1.109	6.931	63.188	1.109	6.931	63.188	1.271	7.941	63.188
7	.975	6.092	69.280						
8	.905	5.656	74.936						
9	.719	4.495	79.432						
10	.667	4.171	83.602						
11	.579	3.616	87.219						
12	.548	3.423	90.642						
13	.482	3.011	93.653						
14	.402	2.514	96.166						
15	.331	2.066	98.232						
16	.283	1.768	100.000						

Extraction Method: Principal Component Analysis.

Source: Primary Problem

The first component has explained 18.58 percent variance, second 10.76, third 10.57, fourth 8.55, fifth 7.78 and the sixth component has explained 6.93 percent of total variation. Cattell scree test (Figure 1) plots the components on the X axis and the corresponding eigen values on the Y axis. As one moves to the right, toward later components, the eigen values drop. When the drop ceases and the curve makes an elbow toward less steep decline, Cattell's scree test says to drop all further components after the one starting the elbow. The scree criterion may result in fewer or more factors than the Kaiser criterion. The Kaiser criterion stopped at 6 components, but sometime the scree plot criterion may be used which would result in selection of 5 or 3 components.

Figure 1: Secree Plot for Perception Regarding SIIP

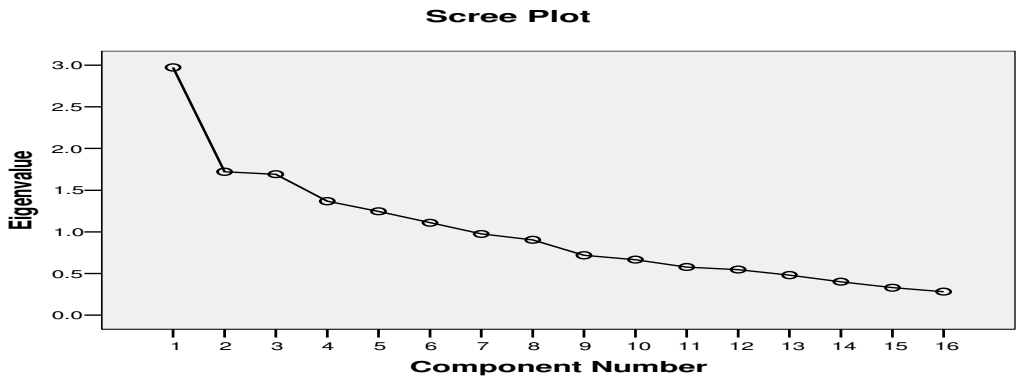

Table IV contains the rotated factor loadings which show correlations between the variable and the factors. Rotation sums of squared loadings represent the distribution of the variance after varimax rotation. Varimax rotation tries to maximize the variance of each of the factors so the total amount of variance accounted for is redistributed over the six extracted factors. The first factor extracted was the combination of 'package has attracted both foreign and domestic investment, conducive environment for industrial growth, package has breeded inefficiency and un-competitiveness and most of the industries will not sustain in the long run'. The second factor extracted was the combination of 'setting up of unit only due to package, continue even after the expiration of the package and expectation from state government to review its policy after incentives by central government to industries expires'. The third factor signifies the combination of 'competitive edge and employment opportunities for locals'. The fourth factor indicates the blend of 'actually benefited, satisfaction level for profitability and packages attract investment in underdeveloped areas'. The fifth factor extracted was a combination of 'threat to economy of the state once the package expires, expected returns and satisfaction level in view of profitability'. The sixth factor is 'setting up units even if package does not exist'. The variables loadings are highest for first component which imbibes 'package has attracted both foreign and domestic investment, conducive environment for industrial growth, package has breeded inefficiency and un-competitiveness and most of the industries will not sustain in the long run' and may be interpreted as industrial incentives package: short term solution of a long term problem'. The second factor may be termed as 'relevance of incentives and concessions', the third may be termed as 'dual benefits of package: to industrial units and society', the fourth as 'increase in investment and other benefits', the fifth as 'benefit to industrial units' and sixth being a single variable should be interpreted as 'setting up units even in the absence of package'.

Table IV: Rotated Component Matrix for the Perception Regarding SIIP

Components / Variables	1	2	3	4	5	6
Package has Attracted Both Foreign and Domestic Investment	.818	.089	.033	-.176	-.073	-.172
Conducive Environment for Industrial Growth	.799	-.046	-.088	.045	-.125	-.177
Package Breeded Inefficiency and Uncompetitiveness	.745	.113	-.234	.019	.002	-.055
Industries will not Sustain in the Long Run	.686	-.087	-.008	.150	-.055	.459
Set up Unit only Due to Package.	.122	.690	.036	.237	.201	-.235
Continue Even after the Expiration of the Incentives	-.140	-.669	.121	.045	.110	-.178
Expectations from the State Government to Review its Policy	-.169	.633	.316	-.137	-.026	.025
Competitive Edge	-.109	.034	.797	-.094	.009	-.149
Employment Opportunities for Locals	-.187	.144	.723	.063	-.070	.400
Actually Benefited	.102	-.063	.092	-.772	.061	-.026
Satisfied with the Profits	.047	-.124	.078	.701	-.220	-.235
Packages Attract Investment in Underdeveloped Areas	.379	.285	-.028	.444	.162	.415
Threat to the Economy	-.177	.079	-.090	-.168	.733	.015
Expected Returns	.079	-.313	.321	.051	.697	.007
Earn More Profits than your Competitors	-.085	.172	-.340	-.137	.498	.095
Set Up Unit Even in the Absence of Package	-.235	-.006	.025	-.188	.070	.699

Extraction Method: Principal Component Analysis.
Rotation Method : Varimax with Kaiser Normalization.
Source: Primary

Conclusions

It can be generalized on the basis of above discussion that SIIP has been witnessed as one of the remarkable steps in the economic history of Himachal Pradesh inspite of the fact that there is a discouraging difference between the expected and actual results. Undoubtedly, the package has attracted both domestic and foreign investments but fingers need to be crossed for its future sustainability as majority of the industrial units do not want to operate in Himachal Pradesh in the absence of any kind of special incentives and concessions. They are looking forward to the state government for its substitution. It is noteworthy that the industrialists have set up their units in Himachal Pradesh only to avail incentives and concessions. It is pertinent to mention here that entrepreneurs do not find the industrial environment of the state to be conducive. Although industrial units availing incentives in the state are earning more profits than their counterparts, but still satisfaction level for profitability has been found very low. Undoubtedly SIIP has made a dent in industrial development of the state but its economy as a whole has remained untouched due to concentration of majority industrial units in its periphery districts. It may be concluded that the opinion of the respondents regarding SIIP in order of the variance extracted in factor analysis are; industrial incentives package: short term solution of a long term problem, relevance of incentives and concessions, dual benefits of package: to industrial units and society, increase in investment and other benefits and setting up units even in the absence of package.

To sum up the foregoing discussion, it may be argued that the ultimate outcome in terms of growth, employment and well-being of the people obviously does not depend only on the scale of financial outlays on development activities, but on how effectively they are used. It is common knowledge that there are serious deficiencies in the design of programmes, scrutiny and evaluation of schemes, in monitoring their implementation and ensuring accountability for performance. Fragmented implementation and virtual lack of credible accounting of government policies leaves much scope for waste and corruption at all levels. Packages of incentives and concessions breed the same. Such packages are expected to bridge the prevailing regional imbalances and income gap but unfortunately they always benefit upper strata of the society and actual beneficiaries remain untouched. This paper has tackled a number of separate but related questions. The advice here is to avoid tax holidays, as they are particularly attractive to short-lived one-off investment. Politico-administrative peculiarities of Himachal Pradesh demand a continuing big role for the state, but future investment in development depends largely upon the private sector. The state has to acquire professional competence in managing the private sector and privatization. A review should be made of the existing legal provisions relevant to different sectors, and all cases that restrain the development process should be revised. A nodal agency should be appointed to co-ordinate and formulate plans to implement the schemes and programmes of industrial development awarded to state by Government of India for extracting maximum benefits. Results of the study will hopefully add to the debate about tax incentives extended to industrially backward states. They suggest at the same time that tax incentives may work in some cases, as there is clearly a measurable effect on investment incurred, units established and employment generated, but also that their economic impact may be limited.

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Advertisement Cause Sales or Sales Cause Advertisement: A Case of Indian Manufacturing Companies

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ABSTRACT

Advertising helps the business achieve competitive advantage by selling its products and overcoming the rivals. Companies use advertisements and publicity for making the masses aware of its products, their features and advantages over the competitors. The present study builds on the literature already available by studying the linkages between advertisement spending and sales revenue in the case of India. The data used in the study is secondary data taken from the company and other resources of financial information. The study used various models including regression and econometric models in order to find out the cause and effect relationship between advertisement expenditure and sales revenue. Except for the Granger's Causality model and VAR model, rests of the tools used (Regression and Variance decomposition) clearly show that there is a significant relationship between advertisement expenditure and sales.

Keywords:-Advertisement, Sales, Linkage, Manufacturing companies

Introduction

Advertising is an important tool of marketing as it helps the business achieve competitive advantage by selling its products and overcoming the rivals. Companies spend money on the advertisements and publicity in order to make sure that the masses are aware of its products, their features and advantages over the competitors. Basic purpose of advertisement is to increase the sales of the advertised products/companies. In the recent years, marketers have been debating over the usefulness of advertisement. While on one hand, some are of the opinion that advertisement expenditure is a wasteful expenditure altogether, others opine that advertisement has been consistent in its contribution towards increasing the sales revenue.

Logically there has to be an impact of advertisement on sales because that is the reason why companies resort to advertising spending. What remains to be seen is though, which companies spend (more heavily) on advertising and which do not. A company that has a higher amount of sales revenue can afford to spend more on advertisements when compared to a company with lower sales revenue. Therefore, another hypothesis that needs to be tested for the businesses is whether higher sales in period 1 lead to higher advertising spending in period 2. While some of the researches reveal the presence of long-term equilibrium relationship between advertising and consumption *(Guo, 2003*and *Phillip, 2007)*, some others view that advertising expenditure causes sales but sales do not simultaneously cause advertising *(Leach and Reekie, 1996).*

There is no dearth of literature on the integration of advertisement expenditure with the sales revenue but a large proportion of such studies have focused on the developed countries. Not many studies seem to have concentrated on the developing nations. Further less number of researchers has concentrated on India for studying the inter-relationship of advertising spending and sales. The present study builds on the literature already available by studying the linkages between advertisement spending and sales in the case of India.

The study is organized as follows. The present part introduces the concept of the study and outlines the need for it; the second part presents the objectives of the study; the third part reviews the literature available; the fourth part describes the methodology for the research; the fifth part presents the results of the study and the sixth part concludes the study.

Objectives of the Study

The study aims to achieve the following objectives:

- To understand the change patterns in the advertisement and sales during a five-year period in Indian manufacturing companies;
- To study the effect of sales on advertisement and that of advertising on sales;
- To suggest to the marketers whether or not increasing the advertising spending is of any significance in increasing the sales.

Review of Literature

A number of researchers examine the effect of advertisement on sales and consumption. The studies of Telser (1964),Taylor and Weiserbs (1972), Rundfelt (1973), Glazer (1981), Jagpal (1981), Leong et al. (1996), Shilbury and Berriman (1996), Dhillon et al. (1997), Metwally (1997), Sachdeva (1988), Elliot (2001), Pagan et al. (2001),Lee (2002), Yiannaka, Giannakas and Tran (2002), Guo (2003), Naik and Raman (2003), Gilbody, Wilson, and Watt (2005), Kaiser and Wright (2006) and Philip(2007), Stange (2007),Sundarsan (2007)are significant in this regard. Taylor and Weiserbs (1972), Guo (2003), Philip (2007), Metwally (1997) study the relationship between advertising and aggregate demand. Jagpal (1981), Pagan et al (2001), Leong et al. (1996) investigate the impact of advertising effectiveness on sales. Yiannaka, Giannakas and Tran (2002) test the effectiveness of advertising in the Greek processed meats sector. Sachdeva (1988) study the trends in advertisement expenditure of India's large corporate bodies. Naik and Raman (2003) present an insight as to how a marketer or a shareholder is keen on measuring the impact of marketing (advertising investment) on market performance. Dhillon et al. (1997) investigate the factors affecting consumer behavior of durable goods and food items. Kaiser and Wright (2006) estimate a two-sided equilibrium model of viewers and advertisers of women's magazines. Elliot (2001) studied the effect of advertising on the food industry. Sundarsan (2007) evaluated the effectiveness of advertising on sales of small and large firms, and for multinational corporations. Shilbury and Berriman (1996) study the effects of advertisements inside an Australian football stadium. Glazers (1981) examine the impact of advertisement on sale of supermarket and small grocery stores. Stange (2007) analyze doctor-patient and drug company-patient communication trends with the help of advertisement effects. Gilbody, Wilson, and Watt (2005) scrutinize the effect of direct-to-consumer advertisement of drugs. Telser (1964) evaluates the relations of advertising and consumer goods industries. Rundfelt (1973), Lee (2002) explores relationship between industry concentration and advertising intensity.

The area and scope of the studies concerning the relationship between Advertising and Sales has been mixed. In majority of the studies, the focus has remained on the developed countries, yet in recent times, such studies have been found to focus on developing countries as well, though not to the same extent as developed countries. Guo (2003) examines the macro level relationship between advertising and consumption using the US data on advertising expenditure, personal consumption and disposable income. Jagpal (1981) studies the advertising sales model of a commercial bank. Leach and Reekie (1996) analyze the market share of a brand in terms to understand the effect. Yiannaka, Giannakas & Tran (2002) examine the Greek processed meats sector using unbalanced panel data set of 34 firms during the period 1983-1987. Metwally (1997) analyzes the consumer goods and services in Australia

during the period 1975-1995. Dhillon et al. (1997) examine a sample comprised of 150 females (75 each from rural and urban areas). Kaiser and Wright (2006) investigate a two-sided equilibrium model of viewers and advertisers of women's magazines. Sachdeva (1988) examine the trends in advertisement expenditure of India's large corporate bodies stated that foreign controlled companies single-handly accounted for a dominant share in advertisement expenditure. Elliot (2001) examines relationship between advertising expenditure and sales. *Shilbury and Berriman (1996)* study the effects of ads inside an Australian football stadium. Glazer (1981) evaluate the supermarket food prices rose relative to those of small grocery stores during the New York City newspaper strike.Stange (2007) analyze doctor-patient and drug company-patient communication trends. Rundfelt (1973) analyze UK and USA manufacturing sectors for understand the effects. Lee (2002) evaluate Korean manufacturing industries for examine the effects.

Empirical researches use different tools to analyze the data about relationship between advertising and sales. Guo (2003) and Leong et al. (1996) apply the cointegration to analyse and evaluate the data. Taylor and Weiserbs (1972) put to use the Houtakker-Taylor model in their research for evaluation purpose. Leach and Reekie (1996) apply the variants of the Koyack Distributed Lag model and Granger's Causality model. Naik and Raman (2003), Pagan et al. (2001) use regression analysis and OLS model. Philip (2007) use Dickey-Fuller test, Philips- Peron Test, Cointegration technique and Error Correction Models to examine association between advertising and consumption. In addition to applying the cointegration model, Guo (2003) implements the unit root test for evaluation. Metwally (1997) implements the correlation test for the evaluation of the data. Telser (1964),Rundfelt (1973) utilize the correlation test to examine the data.

Varied results have been produced by the empirical researches regarding the effectiveness of advertisements in bringing about the increase in sales. Taylor and Weiserbs (1972) conclude that advertising affects aggregate consumption and the relationship between advertising and consumption is not found to be unidirectional but simultaneous. Guo (2003) and Phillip (2007) reveal the presence of long-term equilibrium relationship between advertising and consumption. Jagpal (1981) finds that radio advertising was relatively ineffective in stimulating sales of the joint outputs (number of savings and checking accounts). Leach and Reekie (1996) conclude that advertising expenditure causes sales but sales do not simultaneously cause advertising. Pagan et al (2001) reveals that one time increase in advertising expenditure leads to increase in the sales of orange with a one month lag. It also finds out that the impact of advertising expenditure on grape fruit sales is more immediate and relatively large. While analyzing the relationship between a company's advertising expenditure and its sales during the recession, Leong et al. (1996) find a strong positive relationship between advertising expenditure and sales. Yiannaka, Giannakas and Tran (2002) examine the effectiveness of advertising in the Greek processed meat sector and their results indicate a significant variation across the mediums. Metwally (1997) reveals that growth in advertising expenditure is strongly correlated with growth in sales; that movements in market shares exerts a significant effect on the growth in advertising expenditure, and that the weight of advertising in the marketing- promotional-mix is a strong determinant of growth of advertising expenditure. Dhillon et al.(1997) conclude that Urban respondents were affected the maximum by television and magazines, whereas the rural respondents are influenced advertisements through radio, followed by posters to some extent but were least affected by magazines. Kaiser and Wright (2006)

find that advertisements increased reader utility of magazines. Sachdeva (1988) revealed that consumer goods producing organizations controlled by foreign companies have emerged as one of the most important contributors to advertisement budgets of the corporate world. Elliot (2001) found the stable relationship between advertising expenditure and sales. Sundarsan (2007) revealed that advertising has influenced sales, though its relative effectiveness was not the same for all the categories of firms. Shilbury and Berriman (1996) track awareness over the course of a season and found that recognition of a particular advertiser could exceed 80 percent of their sample, although most other products were significantly lower. Glazer (1981) found that supermarket food prices rose relative to those of small grocery stores during the New York City newspaper strike, which impeded advertising by supermarkets (but not small grocery stores, which do not generally advertise); furthermore, prices rose less in areas of the city that were still partially served by non-striking newspapers. Stange (2007) observe that direct to patient advertising has reversed the communication channel from doctor –patient to rather drug company-patient, and as a result, patients are prone to responding advertisements of the drug companies and often attempt to ignore doctors' advice.Gilbody, Wilson, and Watt (2005) conclude that direct-to-consumer advertising leads to increased prescription of the advertised product. Patients are led to believe the effectiveness of certain drug through professional advertising skills. Telser (1964) find an unimpressive correlation between advertising and concentration for 42 consumer goods industries. Rundfelt (1973) reveals that there is an inverted U relationship between industry concentration and advertising intensity for UK and USA manufacturing sectors, respectively. Lee (2002) observe an inverted U-shaped relationship between industry concentration and advertising intensity for Korean manufacturing industries

Researchers have studied the effect of advertisement on sales and on other components like expenditure, consumption in different countries. However, not much research has been undertaken on the effect of advertisement on sales and vice-versa in the case of Indian companies. The present study will investigate the said relationship with respect to the companies listed at Indian bourses.

Research Methodology

In this research, we study the effect of advertisement on sales and vice versa. The study focuses its concentration on the manufacturing companies of India and a sample of ten large manufacturing companies from India is used for the study. Manufacturing companies usually spend more on advertisement. Further, the impact of advertisement on sales can be worked out for such companies because the sales in units as also sales in Rupees are visible for manufacturing companies, which is not the case for service companies. Hence, in order to establish the linkages between advertisement and sales, the study takes the sample from manufacturing companies. The companies from within manufacturing are chosen on the basis of judgment sampling. The study uses ten large manufacturing companies listed on National Stock Exchange in Tata Motors, Maruti Suzuki, Mahindra & Mahindra, Hero Honda, Exide, Whirlpool, Grasim, Bajaj, Asian paints and Voltas. These companies are among the most renowned in their respective industries.

The sample period for the study is five years ranging from 2005-06 to 2009-10. The study takes a period of five years since in a study related to advertisement; a longer period won't be suitable as the advertisement patterns of the industry undergo major transformation in a longer period. Further, in the light of the industrial revolution and

competitive environment in the industrial sector of India, leaders change every five years. Therefore, we use the sample period of five years for the study.

The study refers to the companies for collecting the data with regard to sales and advertisement and the break-up of advertisement expenditure. Further, reference has been made to the financial data portals including Google Finance, Yahoo Finance, Bloomberg, NSE and BSE.

The study uses descriptive statistics and econometric tools for analyzing the data. There are ten companies for which data of five years has been taken. While the descriptive statistics are presented individually for the ten companies; for the econometric analysis, the procedure adopted is not the same. In the case of econometric analysis, all the ten companies have been grouped together and the data for all the five years has been grouped together as well. In this way, the number of data points goes to 50 (5 x 10). However, there is a threat while grouping different companies into one group because of the difference in magnitude of advertisement expenditure and sales revenue of the companies. The study uses indexing as a means to remove this defect. We adjust the data for all the companies with an index of 100 in order to ensure uniformity across the companies. Afterwards, the log of the series has been computed in order to find out the change in advertisement expenditure and sales revenue across various data points. Several methodological works in econometric analysis suggest such direction for grouping together the data points for different cases *[Theil (2008), Anselin (1988), Fair & Shiller (1990), Franses & Van Dijk (1996), Brooks, Clare and Persand (2000), Arellano (2003), Brooks (2008)]*. Following tools are used for data analysis.

The *mean* is a particularly informative measure of the "central tendency" of the variable if it is reported along with its confidence intervals.

$$\text{Mean} = \frac{\sum X_i}{n} \tag{1.1}$$

Usually we are interested in statistics (such as the mean) from our sample only to the extent to which they can infer information about the population. The confidence intervals for the mean give us a range of values around the mean where we expect the "true" (population) mean is located (with a given level of certainty).

$$s = \sqrt{\frac{\sum (x_i - \mu)^2}{N}} \tag{1.2}$$

where,

μ is the population mean and N is the population size

$$s = [S\ (x_i\text{-}m)^2/N]^{1/2} \tag{1.3}$$

The sample estimate of the population *standard deviation* is computed as:

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{(n-1)}} \tag{1.4}$$

where,

$\bar{x}$ is the sample mean and n is the sample size

The *variance* of a population of values is the square of standard deviation.

Skewness measures the deviation of the distribution from symmetry. If the skewness is clearly different from 0, then that distribution is asymmetrical, while normal distributions are perfectly symmetrical.

$$\text{Skewness} = \frac{nM_3}{(n-1)(n-2)s^3} \qquad (1.5)$$

where

M_3 is equal to: $\sum_{i=1}^{m}\left(x_i - \bar{x}\right)^3$

s^3 is the sample standard deviation raised to the third power

n is the valid number of cases.

Kurtosis measures the "peakedness" of a distribution. If the *kurtosis* is clearly different than 0, then the distribution is either flatter or more peaked than normal; the *kurtosis* of the normal distribution is 0. *Kurtosis* is computed as:

$$\text{Kurtosis} = \frac{n(n+1)M_4 - 3M_2{}^2(n-1)}{(n-1)(n-2)(n-3)s^4} \qquad (1.6)$$

where:

$$M_2 = \sum_{i=1}^{m}\left(y_i - \bar{y}\right)^2$$

$$M_4 = \sum_{i=1}^{m}\left(y_i - \bar{y}\right)^4$$

n is the valid number of cases

A line in a two-dimensional or two-variable space is defined by the equation $Y=a+bX$; in full text, the *Y* variable can be expressed in terms of a constant (*a*) and a slope (*b*) times the *X* variable. The constant is also referred to as the intercept, and the slope as the regression coefficient or *B* coefficient. Multiple regression procedures will estimate a linear equation of the form: $Y=a+b_1X_1+b_2X_2+...+b_pX_p$ (1.7)

The regression line expresses the best prediction of the dependent variable (*Y*), given the independent variables (*X*). However, nature is rarely (if ever) perfectly predictable, and usually there is substantial variation of the observed points around the fitted regression line. The deviation of a particular point from Pearson's chi-square is used to assess two types of comparison: tests of goodness of fit and tests of independence. A test of goodness of fit establishes whether or not an observed frequency distribution differs from a theoretical distribution. A test of independence assesses whether paired observations on two variables, expressed in a contingency table, are independent of each other – for example, whether people from different regions differ in the frequency with which they report that they support a political candidate.

The *Mahalanobis distance* is the distance of a case from the centroid in the multidimensional space, defined by the correlated independent variables (if the independent variables are uncorrelated, it is the same as the simple Euclidean distance). Thus, this measure provides an indication of whether or not an observation is an outlier with respect to the independent variable values.

The *deleted residual* is the residual value for the respective case, had it not been included in the regression analysis, that is, if one would exclude this case from all computations. If the *deleted residual* differs greatly from the respective standardized residual value, then this case is possibly an outlier because its exclusion changed the regression equation.

Cook's Distance is another measure of impact of the respective case on the regression equation. It indicates the difference between the computed B values and the values one would have obtained, had the respective case been excluded. All distances should be of about equal magnitude; if not, then there is reason to believe that the respective case(s) biased the estimation of the regression coefficients.

Data have been analyzed using econometric tools also. The analysis of econometrics can only be performed on a series of stationary nature. In order to check whether or not the series are stationary, we prepare the line graph for each of the series. In order to further confirm the (stationary) nature of the series, correlogram is prepared for each of the series. Further, we perform the Augmented Dickey-Fuller test under the unit root test to finally confirm whether or not the series are stationary. For the basic understanding of Unit root testing, we may look at the following equation

$$y_t = \rho\, y_{t-1} + x_t'\delta + \varepsilon_t \qquad (1.8)$$

where, x_t are optional exogenous regressors which may consist of constant, or a constant and trend, $\rho$and $\delta$are parameters to be estimated, and the $\varepsilon_t$are assumed to be white noise. If $|\rho| \geq 1$, y is a non-stationary series and the variance of y increases with time and approaches infinity. If $|\rho| < 1$, y is a (trend-)stationary series. Thus, we evaluate the hypothesis of (trend-) stationarity by testing whether the absolute value of $|\rho|$ is strictly less than one.

The Standard Dickey-Fuller test is carried out by estimating equation (1.9) after subtracting y_{t-1} from both sides of the equation.

$$\Delta y_t = \alpha\, y_{t-1} + x_t'\delta + \varepsilon_t, \qquad (1.9)$$

where$\alpha = \rho - 1$. The null and alternative hypotheses may be written as,

$$H_0 : \alpha = 0$$

$$H1 : \alpha < 0$$

In order to make the series stationary, we take the log of the two series and arrive at the sales and advertisement of the two series. All the remaining analysis is performed at the sales & advertisement data companies. We name these variables as rsales, and radver respectively.

At the stationary log series we perform the Granger's causality model in order to observe (i) whether the sales causes advertisement and/or vice versa

The Granger (1969) approach to the question of whether x causes y is to see how much of the current y can be explained by past values of y and then to see whether adding lagged values of x can improve the explanation. yis said to be Granger-caused by x if x helps in the prediction of y , or equivalently if the coefficients on the lagged x 's are statistically significant. It is pertinent to note that two-way causation is frequently the case; x Granger causes y and y Granger causes x. It is important to note that the statement "x Granger causes y" does not imply that y is the effect or the result of x. Granger causality measures precedence and information content but does not by itself

indicate causality in the more common use of the term. In Granger's Causality, there are bivariate regressions of the under-mentioned form –

$$y_t = \alpha_0 + \alpha_1 y_{t-1} + \ldots\ldots + \alpha_l y_{t-l} + \beta_1 x_{t-1} + \ldots\ldots + \beta_l x_{t-l} + \varepsilon_t$$

$$x_t = \alpha_0 + \alpha_1 x_{t-1} + \ldots\ldots + \alpha_l x_{t-l} + \beta_1 y_{t-1} + \ldots\ldots + \beta_l y_{t-l} + \mu_t \qquad (1.10)$$

for all possible pairs of (x, y) series in the group. In equation (1.4), we take lags ranging from 1 to l. In Granger's model, one can pick a lag length, l that corresponds to reasonable beliefs about the longest time over which one of the variables could help predict the other.

The reported F-statistics are the Wald statistics for the joint hypothesis:

$$\beta_1 = \beta_2 = \ldots\ldots\ldots = \beta_t = 0 \qquad (1.11)$$

For each equation the null hypothesis is that x does not Granger-cause y in the first regression and that y does not Granger-cause x in the second regression.

We follow the application of Granger's causality with the Vector Auto regression (VAR) Model. The vector auto regression (VAR) is commonly used for forecasting systems of interrelated time series and for analyzing the dynamic impact of random disturbances on the system of variables. The VAR approach sidesteps the need for structural modeling by treating every endogenous variable in the system as a function of the lagged values of all of the endogenous variables in the system. The mathematical representation of a VAR is:

$$y_t = A_1 y_{t-1} + \ldots\ldots + A_p y_{t-p} + Bx_t + \varepsilon_t \qquad (1.12)$$

where y_t is a k vector of endogenous variables, x_t is a d vector of exogenous variables, A_1, …… , A_p and B are matrices of coefficients to be estimated, and $\varepsilon_t$is a vector of innovations that may be contemporaneously correlated but are uncorrelated with their own lagged values and uncorrelated with all of the right-hand side variables.

Finally, we apply the Variance Decomposition Analysis in order to finally quantify the extent upto which the three indices are influenced by each other. While impulse response functions trace the effects of a shock to one endogenous variable on to the other variables in the VAR, variance decomposition separates the variation in an endogenous variable into the component shocks to the VAR. Thus, the variance decomposition provides information about the relative importance of each random innovation in affecting the variables in the VAR.

Results of the Study

The study undertakes statistical methods as mentioned in Section-4 of this paper and present the findings in this section. Table I consisting of descriptive statistics provides an insight into the data. In table I, we present the mean, standard deviation, variance, skewness (statistic and standard error) and kurtosis (statistic and standard error). The Table indicates that Tata Motors generated the highest average sales revenue of 316276.82 crores for the given period followed by Maruti Suzuki, 187545.40 crores and Grasim, 159196.50 crores. In the case of Advertisement, Maruti Suzuki's average expenditure was 3829.400 crores followed by Tata Motors, 2868.400 crores and Grasim's 2744.940 crores. The results of the skeweness and kurtosis indicate that the data is not normally distributed.

Table I: Descriptive Statistics

Name of Company		Mean	Std. Dev	Variance	Skewness		Kurtosis	
		Statistic	Statistic	Statistic	Statistic	St E	Statistic	St Er
Tata Motors	Sales	316276.82	43385.722	1.882E+09	.538	.913	-5.904E-02	2.000
	Advertisement	2868.400	749.2217	561333.140	.024	.913	.068	2.000
Maruti Suzuki	Sales	187545.40	65267.81	4.260E+09	1.028	.913	1.110	2.000
	Advertisement	3829.400	1121.3252	1.257E+06	-3.635E-01	.913	-5.157E-01	2.000
Mahindra & Mahindra	Sales	118168.46	38721.02	1.499E+09	1.244	.913	1.666	2.000
	Advertisement	1824.120	604.9465	365960.227	-4.646E-01	.913	-4.704E-01	2.000
Hero Honda	Sales	116231.84	28295.003	8.006E+08	1.188	.913	1.096	2.000
	Advertisement	2539.220	659.4489	434872.817	1.591	.913	3.106	2.000
Exide	Sales	26581.68	10121.246	1.024E+08	-2.680E-01	.913	-2.115E+00	2.000
	Advertisement	318.200	96.3349	9280.415	-7.608E-01	.913	1.065	2.000
Whirlpool	Sales	16967.834	2895.40	8383346.128	.709	.913	1.439	2.000
	Advertisement	523.332	139.5717	19480.270	1.092	.913	1.358	2.000
Grasim	Sales	159196.50	38577.53	1.488E+09	-8.188E-01	.913	-1.763E-01	2.000
	Advertisement	2744.940	1133.0327	1.284E+06	-1.977E-01	.913	-3.503E-01	2.000
Bajaj	Sales	90737.22	15087.49	2.276E+08	1.216	.913	2.104	2.000
	Advertisement	1173.760	215.2723	46342.148	-8.525E-01	.913	-5.636E-02	2.000
Asian Paints	Sales	50672.06	14650.97	2.147E+08	.318	.913	-1.245E+00	2.000
	Advertisement	1968.860	758.0902	574700.683	.346	.913	-1.475E+00	2.000
Voltas	Sales	32201.574	10632.046	1.130E+08	.166	.913	-1.850E+00	2.000
	Advertisement	172.098	79.6815	6349.145	.342	.913	-1.129E+00	2.000

After presenting the descriptive statistics in Table I, we proceed to analyze the impact of advertisement on sales using the model of regression. Through the regression analysis, we prepare tables II, III and IV that present the Model Summary, Coefficients and ANOVA respectively.

Table II: Model Summary

R	R Square	Adjusted R Square	Std. Error of the Estimate
.786	.618	.610	58198.777
Predictors: (Constant), Advertisement			

Table III: Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	12264.380	13946.094		.879	.384
Advertisement	55.223	6.268	.786	8.811	.000

Close to 1 value of R-square and adjusted R-square in table II implies that the relationship between the two variables is significant. From table III, we can formulate the regression equation Y= a + bX, wherein Y is the dependent variable (Sales) and X is the independent variable (Advertisement). Hence, we arrive at the regression equation

Sales = 12264.380 + 55.223 (Advertisement). In this equation, the level of significance is 0.000, which implies that the regression relation is significant. The application of regression equation to the entire series gives us the predicted values of Sales for the given values of advertisement expenditure. These values shall be presented later in this section in the table V.

Table IV: ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	2.629E11	1	2.629E11	77.627	.000
Residual	1.626E11	48	3.387E9		
Total	4.255E11	49			

Table IV shows the ANOVA table in which we find the sum of squares, mean square, f statistic and level of significance for regression equation as also for the residuals. The first important value that we can look at is the level of significance the value of which is found to be 0.000. This value is significant not just at 5% level of significance but also at 1% level of significance. Looking at the sum of squares, we find that the regression equation accounts for a major proportion of the values of the dependent variable (sales). The detailed values of sales at every level of advertisement expenditure are presented in the table V below.

From Table V, we find that the predicted values in most of the cases are quite near to the observed values, which indicates that there is a significant impact of the advertisement expenditures on the sales. Besides presenting the predicted values of the series, Table V also presents the residual value, standardized predicted value and standard error of the predicted value, Mahalanobis distance, deleted residual, and Cook's distance.

After the regression analysis, the study moves forward to the econometric analysis of the data. For performing the econometric analysis, it is very essential for the researcher to make sure that the series under reference are stationary. In order to make the series stationary, we take log of the advertisement and sales on which the further analysis shall be performed. Log of the two series gives the sales and advertisement value under study. In this way, two new variables are created and we assign those, names rsales & radver, which denote the log of net sales and advertisement expenditure respectively. Going further in the paper, we shall discuss the linkages between the sales and advertisement vice versa.

Figure 1 and Figure 2 present the line graphs of net sales revenues and advertisement expenditure. Figure 3 shows the combine graph of the net sales revenue and advertisement expenditure.

Table V: Predicted & Residual Values, Dependent Variable: Sales

	Observed Value	Predicted Value	Residual	Standard Pred. v.	Standard Residual	Std.Err. Pred.Val	Mahalanobis Distance	Deleted Residual	Cook's Distance
1	267005.6	115669.6	151336	0.05750	2.60033	8244.42	0.003306	154435	0.070652
1	318194.8	151172.6	167022	0.54216	2.86986	9384.04	0.293938	171481	0.112856
1	330939.3	170627.7	160312	0.80775	2.75455	10622.75	0.652460	165837	0.135254
1	285992.7	189690.7	96302	1.06799	1.65471	12107.23	1.140596	100658	0.064730
1	379251.7	226171.1	153081	1.56600	2.63031	15403.21	2.452342	164611	0.280192
2	120034.0	136902.9	-16869	0.34736	-0.28985	8722.52	0.120659	-17257	0.000987
2	145922.0	199415.5	-53493	1.20074	-0.91915	12938.49	1.441786	-56275	0.023105
2	178603.0	218246.5	-39644	1.45782	-0.68117	14650.83	2.125224	-42326	0.016759
2	203583.0	268389.1	-64806	2.14233	-1.11353	19621.27	4.589584	-73117	0.089703
2	289585.0	295724.6	-6140	2.51550	-0.10549	22475.39	6.327733	-7216	0.001146
3	79887.6	66189.7	13698	-0.61797	0.23536	9702.58	0.381893	14089	0.000814
3	96037.2	94226.5	1811	-0.23523	0.03111	8459.73	0.055335	1850	0.000011
3	108046.4	126819.2	-18773	0.20970	-0.32256	8413.19	0.043975	-19173	0.001134
3	126490.6	124908.5	1582	0.18362	0.02719	8370.93	0.033716	1616	0.000008
3	180380.5	152845.8	27535	0.56500	0.47311	9476.73	0.319228	28285	0.003131
4	88702.6	118198.9	-29496	0.09202	-0.50682	8266.03	0.008468	-30104	0.002699
4	100898.1	145589.5	-44691	0.46594	-0.76791	9096.66	0.217104	-45811	0.007569
4	105172.2	134738.2	-29566	0.31781	-0.50802	8644.28	0.101002	-30233	0.002977
4	125398.4	150101.2	-24703	0.52754	-0.42446	9326.25	0.278294	-25354	0.002437
4	160987.9	213812.1	-52824	1.39728	-0.90765	14237.26	1.952388	-56187	0.027889
5	13885.7	21757.2	-7872	-1.22454	-0.13525	13091.76	1.499500	-8291	0.000513
5	18703.2	30918.7	-12216	-1.09947	-0.20989	12300.51	1.208842	-12787	0.001078
5	28449.3	32166.8	-3717	-1.08244	-0.06388	12195.61	1.171667	-3888	0.000098
5	33930.2	28268.0	5662	-1.13566	0.09729	12525.70	1.289722	5937	0.000241
5	37940.0	36071.1	1869	-1.02914	0.03211	11872.37	1.059123	1950	0.000023
6	13456.1	33497.1	-20041	-1.06428	-0.34435	12084.62	1.132681	-20944	0.002792
6	15918.8	35717.1	-19798	-1.03397	-0.34019	11901.36	1.069091	-20662	0.002636
6	17622.5	41366.9	-23745	-0.95684	-0.40799	11446.76	0.915544	-24700	0.003484
6	16467.0	41886.1	-25419	-0.94975	-0.43676	11405.89	0.902031	-26434	0.003962
6	21374.8	53354.8	-31980	-0.79319	-0.54950	10546.64	0.629150	-33066	0.005300
7	101918.9	79498.5	22420	-0.43629	0.38524	8994.43	0.190350	22969	0.001860
7	140951.5	127774.5	13177	0.22274	0.22641	8436.33	0.049615	13460	0.000562
7	169739.2	181026.2	-11287	0.94970	-0.19394	11405.61	0.901938	-11738	0.000781
7	184039.3	187023.4	-2984	1.03157	-0.05127	11886.99	1.064147	-3114	0.000060
7	199333.6	243919.8	-44586	1.80829	-0.76610	17139.80	3.269914	-48821	0.030516
8	74742.2	71342.1	3400	-0.54764	0.05842	9406.00	0.299908	3491	0.000047
8	92855.9	82546.8	10309	-0.39468	0.17714	8860.56	0.155770	10554	0.000381
8	86633.0	82480.6	4152	-0.39558	0.07135	8863.35	0.156485	4251	0.000062
8	84370.0	59353.1	25017	-0.71130	0.42985	10134.88	0.505954	25799	0.002980
8	115085.0	89692.7	25392	-0.29713	0.43630	8593.28	0.088284	25958	0.002169
9	33636.0	77438.7	-43803	-0.46441	-0.75264	9091.23	0.215677	-44898	0.007261
9	40796.8	84026.8	-43230	-0.37447	-0.74280	8799.73	0.140231	-44241	0.006606
9	48879.6	121622.7	-72743	0.13876	-1.24991	8311.01	0.019255	-74257	0.016600
9	59747.1	144258.6	-84512	0.44778	-1.45212	9033.36	0.200503	-86598	0.026670
9	70300.8	177607.9	-107307	0.90304	-1.84380	11140.54	0.815481	-111389	0.067113
10	19544.4	17778.4	1766	-1.27886	0.03034	13445.94	1.635476	1866	0.000027
10	25267.4	17186.4	8081	-1.28694	0.13885	13499.14	1.656212	8540	0.000579
10	30445.4	23557.5	6888	-1.19996	0.11835	12933.49	1.439915	7246	0.000383
10	40332.9	22481.8	17851	-1.21465	0.30673	13027.91	1.475375	18793	0.002612
10	45417.9	27836.7	17581	-1.14155	0.30209	12562.64	1.303129	18440	0.002339

Figure 1

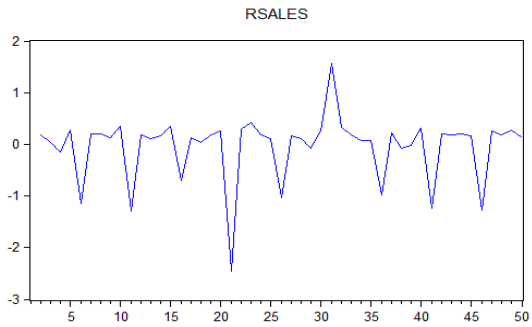


Figure 2

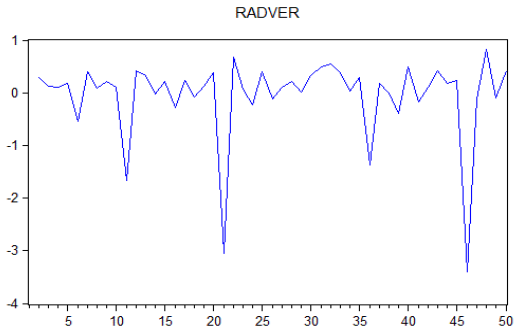
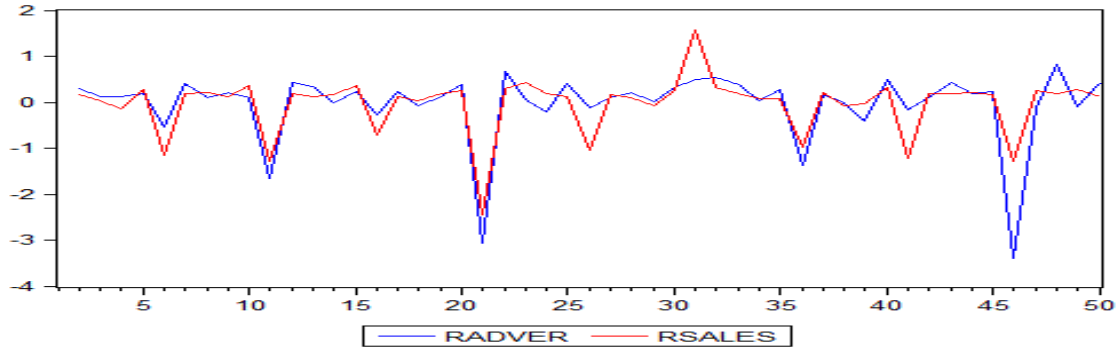


Figure 3



Figures 1 to 3 make it evident that the log series of the two variables are stationary in nature.

The unit-root test is performed on the three series in order to test the null hypothesis that the series has a unit root. The findings of the unit-root test and the augmented Dickey-Fuller test are shown below in Table VI.

Table VI: Unit Root Test and Augmented Dickey-Fuller test for Sales

Null Hypothesis: RSALES has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-8.015535	0.0000
Test critical values:	1% level		-3.574446	
	5% level		-2.923780	
	10% level		-2.599925	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(RSALES)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RSALES(-1)	-1.164958	0.145338	-8.015535	0.0000
C	-0.047053	0.091005	-0.517036	0.6076

By the way of unit-root test, the null hypothesis that series RSALES has a unit-root is tested. Probability value of less than 0.05 in table VI shows that the Null hypothesis is rejected and the variable does not have a unit-root, which confirms that the series is stationary. Similar kinds of results are visible from the Augmented Dickey-Fuller test.

Table VII presents the summary of unit-root test and Augmented Dickey-Fuller test Advertisement Expenditure.

Table VII: Unit Root Test and Augmented Dickey-Fuller Test for Advertisement

Null Hypothesis: RADVER has a unit root				
			t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic			-8.056213	0.0000
Test critical values:	1% level		-3.574446	
	5% level		-2.923780	
	10% level		-2.599925	
*MacKinnon (1996) one-sided p-values.				
Augmented Dickey-Fuller Test Equation				
Dependent Variable: D(RADVER)				
Method: Least Squares				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
RADVER(-1)	-1.172158	0.145497	-8.056213	0.0000
C	-0.053891	0.114811	-0.469393	0.6410

After confirming that the two series are stationary in nature, we proceed to perform the pairwise Granger's Causality analysis for the two. In table VII, we present the application of Vector Auto Regression (VAR) Model at the Sales revenue and Advertisement expenditure.

Table VIII: VAR for Sales Revenue and Advertisement Expenditure

Vector Autoregression Estimates		
Sample (adjusted): 4 50		
Included observations: 47 after adjustments		
Standard errors in ( )& t-statistics in [ ]		
	RADVER	RSALES
RADVER(-1)	-0.153640	-0.099850
	(0.24934)	(0.19767)
	[-0.61620]	[-0.50514]
RADVER(-2)	-0.124946	0.058029
	(0.25111)	(0.19907)
	[-0.49758]	[0.29150]
RSALES(-1)	-0.077892	-0.086616
	(0.31426)	(0.24914)
	[-0.24786]	[-0.34766]
RSALES(-2)	-0.050802	-0.197515
	(0.31688)	(0.25122)
	[-0.16032]	[-0.78624]
C	-0.069537	-0.057998
	(0.12029)	(0.09536)
	[-0.57809]	[-0.60819]

From table VIII, we find that in none of the cases is p-value more than 1.96. Therefore, the application of Vector Autoregression (VAR) models leads us to believe that not only is there no impact of advertisement on sales and vice-versa but these variables fail to impact themselves at the lags 1 and 2.

Finally, the Variance Decomposition Analysis of the three stock exchanges is presented in the table IX and X. The table decomposes the values of advertisement and sales for a lag ranging from 1 to 4.

Table IX: Variance Decomposition Analysis

Variance Decomposition of RADVER			
Period	S.E.	RADVER	RSALES
1	0.819285	100	0
2	0.836494	99.86378	0.136219
3	0.841762	99.84265	0.157349
4	0.842991	99.81866	0.181342

The results produced by Variance Decomposition Analysis and presented in tables IX and X are very interesting in nature. The Variance decomposition analysis shows that till a lag of 4, advertisement expenditure is not influenced by the sales of current or previous periods. However, the composition of sales involves a clear impact of the advertisement expenditure. A look at table X is particularly interesting in this regard. It shows that out of total 100%, 62-63% of the sales are driven by the advertisement expenditure incurred by the company.

Table X: Variance Decomposition of RSALES

Variance Decomposition of RSALES			
Period	S.E.	RADVER	RSALES
1	0.649515	62.76049	37.23951
2	0.662585	63.9467	36.0533
3	0.66704	63.25409	36.74591
4	0.667701	63.29166	36.70834

Conclusion

The study uses various models including regression and econometric models in order to find out the cause and effect relationship between advertisement expenditure and sales. Taking five-year data of ten manufacturing companies of India, the study aims to test whether advertisement expenditure impacts the sales and vice-versa. Except for the Granger's Causality model and the Vector Autoregressive model, rest of the tools used (Regression and Variance decomposition) clearly show that there is a significant relationship between advertisement expenditure and sales. However, variance decomposition does not bring forth any impact that sales (of the current period or at a lag) has on the advertisement expenditure. Hence, we can logically conclude from the study that there is a one-sided relationship between advertisement and sales wherein advertisement expenditure positively impacts the sales revenue of the business.

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An Analysis of Marketing of Vegetables in Jammu District

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ABSTRACT

Vegetables in our country have been identified as most remunerative crops for replacing subsistence farming & play an important role for diversification of agriculture by improving the economic and social status of the people. The production of vegetables being seasonal & highly localized in favoured agro-climatic regions, face tremendous uncertainties on seasonal counts. In addition, vegetables are extremely perishable in nature & that are require speedy & efficient marketing. It constitutes an important component of a balanced diet for human being. Due to unique geographical and climatic conditions, India is endowed with a wide variety of vegetables. This study was undertaken to analyze the price-spread of various vegetables and their marketing costs in Jammu & Kashmir. For the purpose, multistage random sampling technique was followed in which Jammu district was selected purposively due to its major share in vegetable cultivation. From the selected district, two blocks and three villages were selected randomly. A sample of 150 farmers, 10 wholesaler/commission agents and 20 retailers were selected randomly for primary information regarding production & marketing of selected vegetables. Primary data were collected by personal interview method for the Production year 2009-10. The data collected were analyzed for examining the objectives of the investigation viz. marketing cost, marketing margin, price spread. The study showed that the majority of vegetable producer sold through well renowned marketing channel i.e. Producer – Wholesaler / Commission Agent – Retailer – Consumer. The marketing costs incurred by producer are varying from 15.49% to 25.28% & producer share in consumer rupee vary from 30.69% to 39.63%. The margin attained by commission agent varies from 13.69% to 18.88% & marketing cost incurred on produce varies from 4.80% to 8.21%. Similarly, the margin attained by retailer varies from 10.36% to 16.98% & cost incurred on marketing varies from 5.72% to 8.01%. The major share of marketing cost appeared to be incurred on trader's commission, packing charges and transportation charges. The major problems observed in marketing were high cost transportation, trader's commission, packing materials, seasonal gluts, distress sale, losses at every stages, volatile behavior of prices, market imperfections & poor infrastructural facilities etc. The producer's share in the consumer's rupee remained less than 50 percent which reflected inefficiency in the marketing systems. To give boost to the vegetables development, proper input delivery systems, infrastructure facilities and marketing arrangements need to be strengthening in the area.

Key Words: Agriculture, Marketing, Marketing Cost, Margin, Price Spread, Efficiency.

Introduction

In India, agriculture continues to be core sector of economy, on which about 60 per cent of our population is dependent for their livelihood. That's why the economy of India is considered to be predominated by agriculture sector. In India, the small size of farms is striking feature of farming. This creates difficulties in introducing better methods of cultivation and marketing. With the gradual displacement of subsistence farming by commercialized agriculture, marketing of farm products has assumed greater importance in recent years. Unless the marketing efficiency improves, no incentives to increase the production will attract the cultivators. Only better returns, relatively stable prices and attractive terms of trade will motivate the cultivators for commercial agricultural production. (Sangeetha and Banumathy, 2011).

Indian farmers are predominantly small land holders with poor resources; cereals based production systems are their mainstay of income, which are insufficient to fulfill their needs and to improve their living standards. In such a typical scenario, it is the need of the hour to adopt such a production system which is capable of saving the interest of small farmers and uplift their economic conditions. Among horticultural crops, vegetables are regarded as one of the potential options which can improve the economic situation of resource poor farmers through diversifying the existing production system. The production of vegetables in India is highly localized in favoured agro-climatic regions and has been identified as the most viable option for replacing subsistence farming (Kumar *et al*., 2002).

With the suitable agro-climatic conditions prevailing in the country, the vegetable production in India has touched a new height in recent years, placing it as the second largest producer of vegetables in the world, next only to China (Baba *et al*., 2010). These can be grown in relatively shorter period, provide good yield and generate high income and employment opportunities and being rich in nutritional values. Vegetables constitute an important component of a balanced diet for human. Many of the vegetables are of the nature of roughage aiding in digestion. Vegetables play an important role in the development of our country by improving the economic and social status of the people. Due to unique geographical and climatic conditions, India is endowed with a wide variety of vegetables. Among different crops grown in India, vegetables have a significant role in increasing the farm income and meeting the farmer's daily requirements. The vegetable crops were more profitable than other crops particularly food crops. (Prasad, 2001). Per hectare income has been obtained almost four times from vegetable crops as compare to food crops (Srivastava, 1983). Vegetable crops require a chain of marketing functions before reaching the ultimate consumers. As compare to other agricultural commodities, vegetable are more prone to marketing problems because of their basic characteristics of perish ability, bulkiness, scattered production & cultivation in small area. Local markets for vegetables are thin and trading in distant markets is non-remunerative due to higher transportation costs (Kumar *et al*., 2004). The development of farm sector depends not only on advancement of farm technology but improvement in market infrastructure is also essential to ensure better returns to farmers. The efficient marketing can correct the situation. Marketing involves various functionaries for moving the produce from production place to ultimate consumer. It has to be handled & passed through a long chain of various intermediaries with the result that the produce gets a small share of consumer rupee. The efficient marketing of vegetable crops will help in agricultural development of the region/state.

The Jammu & Kashmir (J&K) state has got varied agro-climatic conditions and has high potential for horticultural crops. The horticultural produce plays an important role in the economy of J&K. The area under vegetables have steady increase and during the past two decades, it has increased from 10.27 thousand hectare to 17.7 thousand hectare from 1980-81 to 1999-2000 with an increase in the production from 1.98 to 4.42 lakhs tonnes respectively. The area under vegetables constitute only one per cent of the total cropped area in the state as against 2.8 per cent at national level (Khan & Bashatat, 2006). In the context of above facts the present study was conducted to accomplish the following specific objectives:

i) to examine the existing marketing practices and channels of the study area.
ii) to estimate the marketing cost, margins and price spread.
iii) to determine the various determinants of marketing costs.

Methodology

For the purpose, multistage random sampling technique was followed in which Jammu district was selected purposively due to its major share in vegetable cultivation. From the selected district, two blocks were selected and from the selected blocks three villages were selected randomly. The primary information regarding production & marketing of selected vegetables (Cauliflower, Cabbage, Knol-Khol & Radish) was collected from a sample of comprising 150 farmers from selected villages from each block. In addition to farmers, 10 wholesaler/commission agent and 20 retailers were also selected randomly for obtaining relevant information pertaining to marketing of

vegetables. To numerate the retailers, two major retailing points were selected purposively viz. Nai Basti and Parade. In all, a total of 75 farmers (25 farmers from each village), 10 wholesaler/commission agents & 20 retailers were randomly selected. The primary data from the sampled farmers, wholesalers and retailers were collected by personnel interview method with the help of pre-tested schedule specially designed for the study. *Narwal Mandi* (wholesale market) in Jammu district was selected for the study as produce from the selected villages was coming to *Narwal Mandi* (Jammu). The data collected were analyzed for examining the objectives of the investigation viz. marketing cost, marketing margin, price spread.

List of selected blocks and villages

Block selected	**Village selected**
1) Marh	a) Ghai Tikrian b) Kurloop c) New Basti
2) Vijaypur	a) Koul pour b) Sarore c) Gobindgarh

Economic Analysis

The data collected were tabulated and analyzed for examining the marketing cost, margins and price spread of vegetables at various stages in marketing. To assess the impact of various explanatory variables on marketing cost Regression Analysis was apply. The techniques used for working out the Marketing cost, marketing margins, and price spread as per Acharya and Agarwal (2004). The formulae used are as follows:

1) Marketing Cost:

$$T_c = C_p + {}^{n} Mc_{i\ i=1}$$

Where T_c = Total cost of vegetable marketing

C_p = Marketing Cost incurred by i_{th} middleman

2) **Marketing Margins:** The sum of Average Gross Margin Method was used for calculating marketing margin which is given as under:

$$M_T = \sum_{i=1}^{n} \left(\frac{S_i - P_i}{Q_i} \right)$$

M_T = Total marketing Margin,

S_i = Sale value of product for i^{th} firm,

P_i = Purchase value paid by the i^{th} firm,

Q_i = Quantity of the product handled by the i^{th} firm,

i = 1,2,3 ….n, (number of firms involved in the marketing channel).

3) **Price Spread:** Price spread was calculated using following relation:

$P_s = CP_T - PP_T$

Where, P_s = Price Spread at time T,

CP_T = Consumer's Purchase Price / Retailer's Sale Price at time T,

PP_T = Produce's Sale Price at time T,

In order to identify the determinants of marketing cost, the multiple linear regression analysis was performed. The fitted regression model took the following linear form:

$$MC = a + b_1 QS + b_2 CP + b_3 CT + b_4 CC$$

Where, MC = Marketing cost (Rs/q)

QS = Quantity of vegetable sold (q)

CP = Expenditure on packing (Rs/q)

CT=Transport Cost (Rs. /q)

CC = Commission paid (Rs/q)

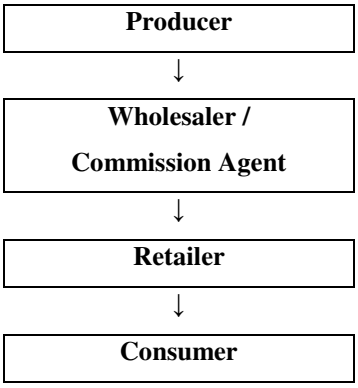
a = Intercept

and b_1, b_2, b_3 and b_4 are the regression coefficients for respective explanatory variable.

Results and Discussion

Existing Marketing Practices and Channels

The study of marketing structure is mainly related with different practices and marketing channels through which the produce moves from the farm to the ultimate consumer. From the study, it was found that mainly vegetable producers sold their surplus at Narwal Mandi in the Jammu city to get the higher share in consumer's rupee. The most familiar practice for moving the produce to end consumer was through commission agent / wholesaler. This marketing practice was mostly adopted because it was observed that vegetable producers nearby the marketing centre and availed the facility of forwarding their produce directly to retailer through commission agent by paying 4-7 percent commission for his services.



Marketing costs, Margins and Price-spread

Various marketing costs and margins of wholesaler/commission agent and retailers are calculated as a percentage to the consumer' rupee for both the blocks and given in Table-I and Table-II. The marketing costs, margin and price spread of cauliflower, cabbage. Knol- khol & radish of Marh block is given in Table I. The producer share in consumer's rupee was observed to be highest in case of cauliflower (39.63%) followed by radish (38.94%), knol-khol (38.04%) and cabbage (31.23%) respectively. Marketing cost incurred by the producer in whole sale market was observed to be highest in case of cabbage (24.74%). Out of price paid by retailer, the margin of wholesaler /commission agent was observed to be highest in case of knoll-khol (18.88%) followed by cabbage (18.66%), radish (17.43 %) and cauliflower (13.69 %) respectively. Marketing cost on loading/unloading, market fee, storage and losses incurred by the wholesaler/commission agent were found to be highest in case of cabbage (7.40%) followed by knol-khol (7.00%), radish (6.98%) and cauliflower (4.88%) respectively . Margin of retailer was found to be highest in case of cauliflower (16.98%) followed by knoll-khol (13.86%), radish (11.57%) and

cabbage (10.68%) respectively and marketing cost on loading/unloading, transportation storage and octroi was highest in cabbage (7.29%) followed by radish (7.17%), knoll-khol (6.74%) & cauliflower (5.72%).

As for as Vijaypur block (Table II) is concerned net price received by the producer was maximum in cauliflower (39.44%) followed by radish (38.28%), knol-khol (38.02%) & cabbage (30.69%) respectively. Marketing cost incurred by the producer were observed to be maximum in case of cabbage (25.28%) followed by cauliflower (19.30%), radish (18.57%) and knoll-khol (15.57%) respectively. Margin of wholesaler/commission agent was observed to be highest in case of cabbage (18.68%), but the marketing cost incurred by wholesaler/ commission agent was found to be highest in case of radish (8.21 %). Margin of retailer was found to be highest in case of cauliflower (16.98%) and marketing cost found to be higher in case of radish (8.01%). It is here worth mentioning that the Vijaypur block is located far from the Narwal market so the cost of transportation to the farmers is more by Rs.10 to Rs.20/quintal. In this context the commission agents are charging less commission from the farmers belongs to Vijaypur block.

Determinants of Marketing Cost

For the identification of determinants of marketing cost the analysis was done for all the vegetables on pooled as depicted in Table-III. The coefficient of multiple determinations (R_2) was found to be statistically significant and quite high in case of all the vegetables. The regression coefficient of variable quantum of quantity sold was found negative and significantly affecting marketing cost in cabbage and radish. The cost of packing/ grading was an important determinant of marketing cost in all the vegetables. Similarly, the transport cost in all the vegetables appeared with positive and significant coefficient. The regression coefficient of amount of commission paid turned out to be positive and significant in all the vegetables. Thus, result showed that in the area packing/grading cost, transportation cost and commission charges were the important variant of marketing cost of vegetables.

Table I: Decomposition of Marketing Costs Components for Different Vegetables in Marh block of Jammu District (2009-10) **(Rs/q)**

S.No.	Functionary	Vegetables			
		Cauliflower	Cabbage	Knol-Khol	Radish
1.	Net Price received by the producer	595.26 (39.63)	325.25 (31.23)	341.25 (38.04)	309.18 (38.94)
2.	Marketing cost incurred by the producer	286.86 (19.10)	257.58 (24.74)	138.92 (15.49)	142.3 (17.92)
	i) Grading charges	39.54 (2.63)	35.89 (3.45)	25.39 (2.83)	34.18 (4.30)
	ii) Packing/packaging charges	77.25 (5.14)	75.65 (7.26)	23.54 (2.62)	17.28 (2.18)
	iii) Transportation charges	54.85 (3.65)	39.49 (3.79)	37.85 (4.22)	35.65 (4.49)
	iv) Loading/unloading charges	11.6 (0.77)	12.72 (1.22)	6.54 (0.73)	6.87 (0.87)
	v) Commission	92.39 (6.15)	75.58 (7.26)	36.45 (4.06)	38.96 (4.91)
	vi) Other expenses	11.23 (0.75)	18.25 (1.75)	9.15 (1.02)	9.36 (1.18)
3.	Price paid by commission agent / Wholesaler (Producer's sale price)	882.12 (58.74)	582.83 (55.97)	480.17 (53.53)	451.48 (56.86)
4.	Marketing cost incurred by the Commission agent / wholesaler	73.29 (4.88)	77.08 (7.40)	62.78 (7.00)	55.39 (6.98)
	i) Loading / unloading charges	8.56 (0.57)	9.28 (0.89)	7.69 (0.86)	6.69 (0.84)
	ii) Market fee @ Rs. 3/day	5.65 (0.38)	6.57 (0.63)	6.79 (0.76)	6.71 (0.84)
	iii) Other expenses	4.85 (0.32)	5.87 (0.56)	5.98 (0.67)	6.74 (0.85)
	iv) Storage/shop rent	54.23 (3.61)	55.36 (5.32)	42.32 (4.72)	35.25 (4.44)
5.	Margin of commission agent / wholesaler	205.56 (13.69)	194.32 (18.66)	169.33 (18.88)	138.42 (17.43)
6.	Price paid by Retailer (Wholesaler's sale price)	1160.97 (77.30)	854.23 (82.03)	712.28 (79.40)	645.29 (81.26)
7.	Marketing cost incurred by Retailer	85.89 (5.72)	75.86 (7.29)	60.48 (6.74)	56.92 (7.17)
	i) Loading / unloading charges	15.75 (1.05)	14.26 (1.37)	16.32 (1.82)	11.25 (1.42)
	ii) Transportation	33.62 (2.24)	26.65 (2.56)	25.32 (2.82)	23.35 (2.94)
	iii) Storage/End Spoilage	25.32 (1.69)	23.65 (2.27)	11.25 (1.25)	15.35 (1.93)
	iv) Octroi	3.65 (0.24)	3.65 (0.35)	5.23 (0.58)	2.35 (0.30)
	v) Other expenses	7.55 (0.50)	7.65 (0.73)	2.36 (0.26)	4.62 (0.58)
8.	Margin of Retailer	255 (16.98)	111.22 (10.68)	124.32 (13.86)	91.88 (11.57)
9.	Price paid by consumer (Sale price of Retailer)	1501.86 (100.00)	1041.31 (100.00)	897.08 (100.00)	794.09 (100.00)

Note: Figures in parentheses are the percentage of total.
Source: Primary Survey

Table II: Decomposition of Marketing Costs Components for Different Vegetables in Vijaypur Block of Jammu District (2009-10) **(Rs/q)**

S.No.	Functionary	Vegetables			
		Cauliflower	Cabbage	Knol-Khol	Radish
1.	Net Price received by the producer	592.3 (39.44)	319.6 (30.69)	341.11 (38.02)	303.98 (38.28)
2.	Marketing cost incurred by the producer	289.82 (19.30)	263.23 (25.28)	139.71 (15.57)	147.5 (18.57)
	i) Grading charges	39.58 (2.64)	36.54 (3.51)	25.39 (2.83)	34.18 (4.30)
	ii) Packing/packaging charges	79.25 (5.28)	78.65 (7.55)	23.54 (2.62)	19.48 (2.45)
	iii) Transportation charges	70.72 (4.71)	54.49 (5.23) 13.04	45.64 (5.09)	43.65 (5.50) 6.87
	iv) Loading/unloading charges	13.6 (0.91)	(1.25) 60.58 (5.82)	6.54 (0.73)	(0.87) 33.96 (4.28)
	v) Commission	73.39 (4.89)	19.93 (1.91)	29.45 (3.28)	9.36 (1.18)
	vi) Other expenses	13.28 (0.88)		9.15 (1.02)	
3.	Price paid by commission agent / Wholesaler (Producer's sale price)	882.12 (58.74)	582.83 (55.97)	480.82 (53.60)	451.48 (56.86)
4.	Marketing cost incurred by the Commission agent / wholesaler	75.5 (5.03)	77.29 (7.42)	67.28 (7.50)	65.2 (8.21)
	i) Loading / unloading charges	8.56 (0.57)	9.28 (0.89)	7.69 (0.86)	8.5 (1.07)
	ii) Market fee @ Rs. 3/day	5.00 (0.33)	5.00 (0.48)	5.00 (0.56)	5.00 (0.63)
	iii) Other expenses	5.71 (0.38)	5.87 (0.56)	5.98 (0.67)	6.74 (0.85)
	iv) Storage/shop rent	56.23 (3.74)	57.14 (5.49)	48.61 (5.42)	44.96 (5.66)
5.	Margin of commission agent / wholesaler	203.35 (13.54)	194.48 (18.68)	164.18 (18.30)	128.61 (16.20)
6.	Price paid by Retailer (Wholesaler's sale price)	1160.97 (77.30)	854.6 (82.07)	712.28 (79.40)	645.29 (81.26)
7.	Marketing cost incurred by Retailer	85.89 (5.72)	78.86 (7.57)	66.16 (7.38)	63.59 (8.01)
	i) Loading / unloading charges	15.75 (1.05)	15.91 (1.53)	16.32 (1.82)	14.92 (1.88)
	ii) Transportation	35.62 (2.37)	27.65 (2.66)	25.32 (2.82)	23.35 (2.94)
	iii) Storage/End spoilage	25.32 (1.69)	25.65 (2.46)	15.25 (1.70)	15.35 (1.93)
	iv) Octroi	1.65 (0.11)	1 (0.10)	1.23 (0.14)	1.35 (0.17)
	v) Other expenses	7.55 (0.50)	8.65 (0.83)	8.04 (0.90)	8.62 (1.09)
8.	Margin of Retailer	255 (16.98)	107.85 (10.36)	118.64 (13.23)	85.21 (10.73)
9.	Price paid by consumer (Sale price of Retailer)	1501.86 (100.00)	1041.31 (100.00)	897.08 (100.00)	794.09 (100.00)

Note: Figures in parentheses are the percentage of total.

Table III: Regression Coefficients of Various Explanatory Variables, Coefficient of Determination (R^2) of the Fitted Multiple Linear Regression Equation of Marketing Cost for Different Vegetables

Vegetable	Intercept	Quantity Sold (qtl)	Expenditure on packing/grading (Rs)	Transportation cost (Rs. qtl)	commission paid (Rs. qtl)	other expenses (Rs. qtl)	R^2
Cauliflower	4.49	0.0048	0.992**	1.735**	1.019**	0.993**	0.897**
Cabbage	4.643	-0.0028	0.984**	1.083**	0.998**	0.995**	0.994**
Knol khol	3.405	0.015*	1.032**	0.997**	0.932**	1.017**	0.981**
Radish	1.642	-0.003	1.137**	0.892**	1.063**	1.153**	0.904**

Note: *Significant at 5% probability level, ** Significant at 1% probability level

Constraints Faced by the Producers

The perusal of data/information indicated in Table IV, revealed about the problem faced by the producers at pre and post harvest level of marketing of vegetables in study area. Lack of mobile testing labs, fiancé and credit facility, latest technical know-how and do-how, non-availability of inputs in time, shortage of labour during peak period, lack of good quality seed were the main problems identified in study at pre-harvest level.

Similarly, at post-harvest level, problems like lack of mechanical grading, packing, storage facilities, processing units, co-operative societies, price control / regulation, un-organized marketing, and malpractices, high and undue marketing margins were the main problems faced by the producer.

Table IV: Constraints Faced by the Farmers in Marketing of Vegetables at Pre-harvest and Post harvest Levels in Study Area

S.No.	Constraints	Percentage of farmers (N = 150)
	Pre-harvest Level	
1.	Lack of timely and adequate availability of essential inputs	50.00
2.	Inadequate or no irrigation facilities	1.33
3.	Non-availability of fertilizers in time	79.33
4.	Lack of good quality seed in sufficient quantity	44.66
5.	High cost & non-availability of pesticides & weedicides	34.66
6.	Lack of finance & credit facilities	89.33
7.	Soil testing facilities are not available	82.66
8.	Lack of latest technical know-how & do-how	85.33
9.	Lack of extension teaching & communication contacts	38.00
10.	Shortage of labour during peak period	39.33
11.	Lack of mobile testing lab	98.00
	Post-harvest Level	
1.	Un-organized marketing & low prices paid to farmers	64.66
2.	Malpractices, high & undue marketing margins & deductions in the market	30.66

3.	Lack of mechanical grading, packing & proper storage facilities	99.33
4.	High Perishability of the vegetables	98.00
5.	Lack of village roads, sufficient & low cost transportation facilities	6.66
6.	Lack of price regulation & control	93.33
7.	Lack of processing units & co-operative societies	95.33

Conclusion and Policy implications:

Vegetable Marketing is highly risky due to wide yield and price variation and need quick disposal because of the perishable nature of vegetables. For all these reasons, marketing system of vegetables need to be alert and pay personal attention to production and marketing aspects.

Study showed that the only one marketing channel identified in the present study for marketing of vegetables i.e. **Producer – Commission Agent/Wholesaler – Retailer – Consumer.** The function of the commission agent/wholesaler is to sell the product of a producer without owing the risk of loss and cost. For their service, the charges varied to 4-7 per cent of sale value. The marketing cost incurred by the producer's was highest in Vijaypur block due to high cost of transportation, grading and packing. It was found that trader's commission is less for Vijaypur producer due to large distance covered by producer as compare to Marh block. Producer's share in consumer rupee little higher in Marh block as compare to Vijaypur block.

Several measures are recommended for improving the marketing of vegetables in the country. The following major recommendations emerge from the studies reported here on improving the marketing efficiency of vegetables. Most of vegetable produce was disposed of through Producer – Commission Agent/Wholesaler – Retailer – Consumer channel. This led to increase in wastage & marketing cost. This can be reduced by providing regulated marketing facilities. Mere regulation of marketing by a simple legislation does not solve the problem & what is needed & lacking is strict supervision. Due to perishable nature of vegetable crops & huge glut during peak season, farmers do not get remunerative prices. Therefore, storage facilities as well as a small unit of processing need to be established in the area. Majority of farmers is small & not able to take the produce in distant market for selling due to lack of market intelligence & fear of getting cheated by the middleman. There is dire need to improve market intelligence system & promotion of farmer's organization for group marketing. There is need to control the activities of the commission agents for encourage self-marketing. Efforts to improve the transparency in the market operations through better supervision by the market committee would be another important factor in improving the marketing efficiency. Finally there is substantial scope for improving the marketing efficiency by improving the market information system by making available latest and extensive market information to all market participants through the use of internet facilities and other means of communication.

(Based on M Sc. Thesis Submitted to the Sher-e-Kashmir University of Agricultural Science & Technology of Jammu (SKUAST-J), J&K, India.)

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Sustainability of Development: With Special Reference to India

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ABSTRACT

The concept of sustainable development has far deeper connotation than mere economic development. It encapsulates consideration of not only economic prosperity but also protection of environment and assurance to social equity. In fact it is a process of change for betterment without making any compromise or undermining and threatening the future potential of natural and non-renewable natural resources. The growing challenges of sharp rise in asset prices, poor infrastructure, lack of safe drinking water, poor sanitation facility, shoddy roads, loss of tropical forests, exposure to hazardous chemicals, soil erosion, land degradation, health problems, fragile and complex risk prone environment have further magnified the resonance of the concept. These issues call for an urgent action to ensure sustainability of development process. In practice, almost every country is initiating different initiatives to ensure the sustainability of development. But still the concept of sustainable development seems to be an insurmountable problem for many of them. In this context the present paper attempts to investigate whether the India's development is sustainable or not?

Key Words: Development, Economic, Equity, Environment, Sustainability

Introduction

The concept of sustainable development is in vogue since early 1970s. The credit to bring the concept to international arena goes to UN Stockholm Conference on the Human Environment in 1972. Later on in 1987 World Commission on Environment and Development established a normative-conceptual bridge between environmental concerns and development outcomes. Some international milestones in this context may be narrated as follows:

Since last four decades eminent scholars are indulge in exploring different indicators, scope and institutional framework for sustainable development (SD). Traditionally the primary concern of studies was to avoid environment degradation and one can easily argue environmental concern as the cornerstone of SD. Sachs (2004) has described it as a process seeking prosperity for the poor through living in synergy with the planet. SD is a process of change for betterment through maintaining the quality of environmental and social systems along with the economic development. In India also several initiatives has been taken to ensure SD. Some of the prominent initiatives may be discussed in the following section.

Initiatives Taken to Ensure Sustainable Development in India

In fact, the attempt to ensure sustainability of development process has been aggressively made at the global level for last few decades. In India also different projects have been undertaken to meet socio-environmental challenges and ensure the development of economy on an equitable ground. In 1972 the National Council on Environmental Policy was being set up. It was later on evolved into Ministry of Environment and Forest (MoEF) with an objective to assure the practices for promoting environment protection. In 2002 the ministry carried out a detail study entitled as Empowering Pupil for Sustainable Development. The main objectives of the study were empowering pupil, combating poverty, using core competence in science and technology and setting environmental standard. MoEF has also started National Green Corps program to discuss environmental issues through school eco-clubs. In 2002, the concept of sustainable development was attempted to be carried out through Biological Diversity Act. This act integrates the conservation, promotion and sustainable use of biological diversity into different programs. In addition to these some organizations have also initiated projects to address the issue sustainable development. For

instance Chatrasal Seva Sansthan has undertaken a project entitled as Tarikhet Non-conventional Energy Project (2003 – 2006). The prime objective of the project was to address the issue of climate change. In the same thematic area, a project was undertaken by Nidan to facilitate and disseminate sustainable decentralize community led systems for solid waste management. The project was entitled as Strengthening the Role of Safai Mitras (Ragpickers) in Solid and Bio-medical Waste Management in Bihar. In September 2004 Peekay Tree Corps Development Foundation has initiated a project on Bio-diversity Conservation. The project was entitled as Promoting Coconut Based Agro-ecosystem and Efficient Product Utilization for Augmenting on Farm Income, Improving Quality of Environment and conserving natural resource. Khangchendzonga Conservation Committee has also undertaken a project for the same thematic area. The project was entitled as Sustainable Khangchendzonga Bio-diversity Conservation in the Biosphere Reserve, Sikkim. These projects were finance through Small Grant Programs from the Global Environment United Nation Development Programs.

Table I: List of Some International Landmarks for Sustainable Development

Year	Action/ Event
1972	United Nations Conference Environment in Stockholm to discuss harmful effect of human activity on environment.
1983	Appointment of World Commission on Environment and Development. It released a report stressing upon the need to change human development compatible to planet's ecological limits.
1988	Setup of Intergovernmental Panel on Climate Change.
1992	United Nations Conference on Environment and Development in Rio de Janeiro, Brazil. It addresses the problem of socio-economic development.
1997	Conference was held in Kyoto, Japan addressing the issue of Global Warming. The Kyoto Protocol was created which mandated the practices to reduce Green House Gas Emission.
2001	Marrakesh Accord was built.
2002	World Summit on Sustainable Development was convened at Johannesburg, South Africa. It stressed upon nation's commitment towards sustainable development and its implementation by fostering partnerships among government, private sector and civil society.
2007	United Nations Climate Change Conference in Bali. It came out with launch of Adaptation Fund and decisions on technology transfer as well as reduction of emissions.
2009	Copenhagen Meet.

Source: Compiled by the Author

All these initiatives have been taken with a sole objective of sustainable development of India. In this reference the present paper attempts to assess the sustainability of development process in India. In the first section, paper discusses different indicators used worldwide to evaluate sustainability of development of a nation and also the different variables used in the present paper studied to analyse the sustainability of development. In second section it attempts to evaluate sustainability of India's development in terms of economic progress, environmental protection and social equity. It tries to explore different challenges to SD in India. In last section it suggests some measures for the betterment of the situation.

Indicators of SD

SD emphasizes upon revaluation of economic viability of development process with due regards to equity, social justice, healthcare, rational use of non-renewable energy resources and environment protection. The process of sustainable development encompassing pollution control and stewardship of natural resources is of growing concern in both advanced and developing economies. However the nature of problem may vary from one country to another. For instance in developed nations industrial pollution, greenhouse gas emissions and rising levels of waste are more visible while unavailability of safe drinking water, access to basic sanitation, poverty, unemployment, poor

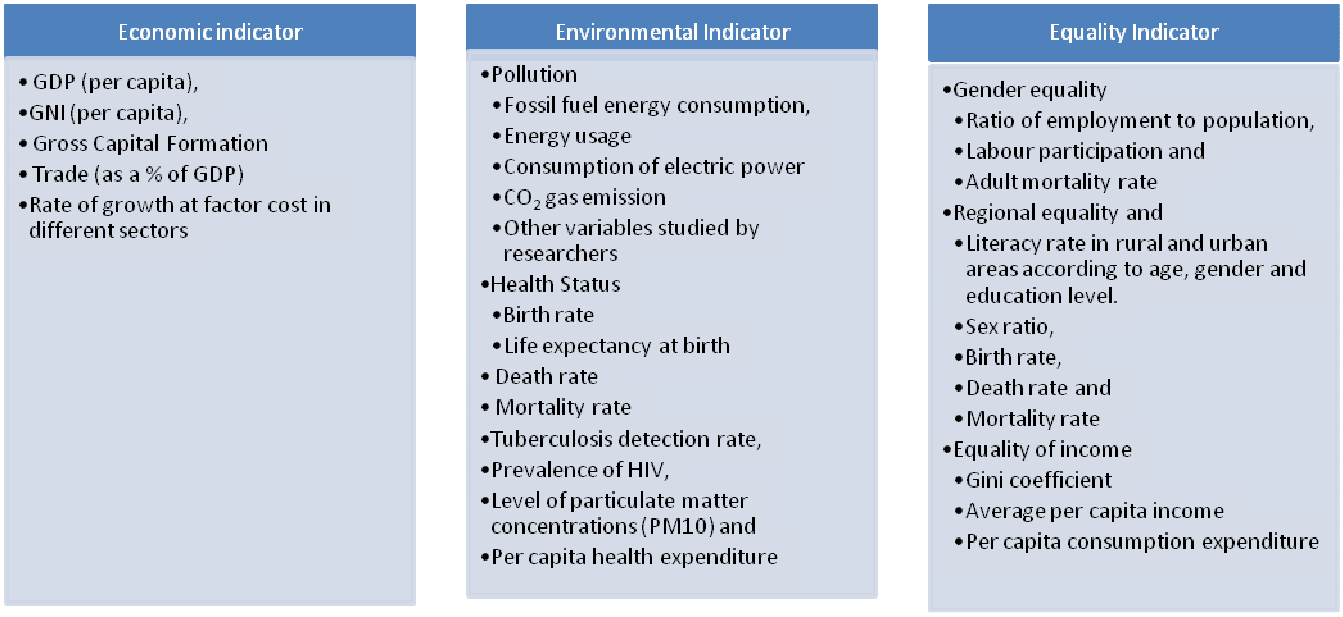
healthcare, social exclusion, lack of basic education and under-investment in basic environmental amenities are quite apparent in developing nations. That is the reason why researchers have explored number of indicators.

In 1996 the first draft of the publication of UNCSD "Indicators of Sustainable Development: Framework and Methodologies" was publicized. It included a list of about 140 indicators along with their detailed methodological aspects. These indicators have been organized in four categories: social, economic, environmental and institutional and are related to the chapters of Agenda 21. Later on another to measure sustainability was explored which was an indirect way of assessment. It was named as ecological footprint (EF). EF is an accounting tool to measure the proportion of nature that a given population or country is using. The measurement of E.F. is supposed to be in land units. (Wackernagel and Rees, 1996; Wackernagel et al, 1997). The concept is based on the issue of equity among different nations. Bossell (1999), noted that SD encompasses environmental, material, social, cultural, political and psychological dimensions. The approach advocates that SD is an attempt to ensure the most effective utilisation of non-renewable resources for economic well-being with minimum hazard to society and environment. Kates et al. (2005) summarized some implicit as well as explicit indicators of sustainable development.

Analysis of Indian Development Process

As stated in previous section, there is a wide spectrum of SD indicators. The indicators used in study for analysing sustainability are as follows:

Chart I: Indicators used in the Present Study



Economic Indicator

India has shown improvement in terms of economic performance. According to Gross National Income by Atlas method, it stood at 11th rank with an income of 1,367,105 million US dollars in 2009. During the study period (1999-2009), the economic indicators like GDP per capita, GNI per capita and Percentage of trade to GDP have recorded a continuous rise (Table II).

Table II: Economic Indicators of India

Year	GDP per capita (Constant 1990 PPP $)	GNI per capita, Atlas Method (Current US $)	Gross Capital Formation (% of GDP)	Trade (% of GDP)
2000	5061	450	24.16	27.38
2001	5226	460	24.18	26.41
2002	5295	470	25.24	29.97
2003	5607	530	26.77	30.9
2004	5879	640	32.65	36.89
2005	6276	750	34.28	41.16
2006	6714	850	35.49	45.69
2007	7124	990	37.71	45.25
2008	7445	1080	34.88	52.47
2009	NA	1180	35.04	45.84

Note: NA stands for Not Available
Source: IMF

As shown from the above table the share of capital formation is increasing which further strengthens the development process and India is turning to be one of the major economies of the world. However, share of agriculture in total gross capital formation has shown different swings during the study period. In 1999-2000, it was 8.6, from which it rose to 10.2 in 2001-02. Further in 2006-07 it reduced to just 5.8. Agriculture in India demonstrate a lopsided development which is at one side patronage by technical innovations and agriculture research institutes and at the flip side soil erosion, water logging, deforestation are resulting into expansion of deserts, dust storms and loss of crops brutally affects its productivity. The irrational use of natural non-renewable resources has further magnified the degradation of soil. It led to more arid, alkaline, ravine and posed serious threat to biological diversity as well. \The rate of growth in different sectors may be observed through table III.

Table III: Growth Rate in Different Sectors

Growth Rate at factor cost (at 2004-05 prices)	2005-06	2006-07	2007-08	2008-09	2009-10
Agriculture, Forestry & Fishing	5.2	3.7	4.7	1.6	-0.2
Mining & Quarrying	1.3	8.7	3.9	1.6	8.7
Manufacturing	9.6	14.9	10.3	3.2	8.9
Electricity, Gas & Water Supply	6.6	10.0	8.5	3.9	8.2
Construction	12.4	10.6	10.0	5.9	6.5
Trade, Hotels & Restaurants	12.4	11.2	9.5	5.3	8.3
Transport, Storage & Communication	11.5	12.6	13.0	11.6	-
Financing, Insurance, Real Estate & Business Services	12.8	14.5	13.2	10.1	9.9
Community, Social & Personal Services	7.6	2.6	6.7	13.9	8.2
GDP at Factor Cost	9.5	9.7	9.2	6.7	7.2

Note: * Transport & communication included for 2009-10 in trade, hotels and restaurants.
Source: MOSPI (CSO)

Recent global recession was marked up by the fall in growth rate of GDP in all sectors, sharp drop in investment, high inflation, fiscal deficit and resultant tightening of macroeconomic policies. As shown from the above table, during 2008-09 in India also a serious drop out was observed in almost every sector of the economy (with an exception to community, social and service sector). However, in the second half of 2009, the economic growth of various developing and developed nations took root and extended to advanced economies. The well-knit mechanism of various macroeconomic policies of India also deliberately attempted to recover the loss. World Bank (2011) also acknowledged that Indian government was quite successful in cushioning the impact of the global financial crisis on India. The recovery in GDP growth in India for the year 2009-10 is broad based. Seven out of eight sectors/sub sectors shows a growth rate of 6.5 per cent or higher with an exception of agriculture and allied sectors where the

growth rate is estimated to be minus 0.2 per cent over 2008-09. World Bank (2011) estimates that India continues to grow at a rapid pace, although the government recently reduced its annual GDP growth projection from 9% to 8% for the current fiscal year ending March 2012. Further it expects that a number of millennium development goals will be met under the Twelfth Five Year Plan (2012-17).

Environmental Indicator

Traditionally the concept of development was treated to be associated with only economic prosperity of the country. But global warming and occurrence of frequent natural disasters have compelled to review the opinion and consequently environmental issues came out as a serious matter of concern while discussing sustainability of development. A development with a pretention of having economic despoliation can never be treated as a desirable goal. In practice there are various measures to study the state of the environment in a country. OECD (1993) recognized variety of environmental issues like climate change, ozone layer depletion, eutrophication, acidification, toxic contamination, urban environmental quality, biological diversity, landscape, waste, water resources, forest resources, fish resources, soil degradation, while, there is a last 14nth issue called general indicators not attributable to specific issues. It has publicized a report entitled as "OECD Core Set of Indicators for Environmental Performance Reviews" which discussed Pressure-State-Response framework. Some researchers have studied the pernicious impact of the process of development on the environment in terms of air pollution which implies for presence of one or more contaminants in atmosphere in such quantities that they become or tend to be injurious to living organs. One of the major pollutants is carbon gas emission.

The same indicator has been used by Asian Development Bank also. A joint study by Asian Development Bank, UNDP and ESCAP reported that on environmental sustainability, which is one of the eight goals of the MDG, India has really regressed in the matter of carbon dioxide emission and consumption of ozone-depleting CFCs. Narayanan and Palanivel (2003) compared the average rate of change in environment indicators of India, China and Indonesia on the basis of data provided by World Development Report. The study revealed the growing burden of CO_2 (per capita) as well as CO_2 kg per $ of GDP with reference to India during 1991-96 as compared to 1981-90. Mukhopadhyaya (2003) compared per capita emission in some selected countries including India. Per capita carbon emission during 1996 has shown a rise for developing as well as developed country. The results of the study may be observed from the table IV.

Table IV: Per Capita Emissions in Different Countries

Country	Per Capita Emission in tonnes of carbon (1990)	Per Capita Emission in tonnes of carbon (1996)
Bangladesh	0.04	0.05
Bhutan	0.02	0.04
India	0.22	0.29
Maldives	0.19	0.31
Nepal	0.01	0.02
Pakistan	0.16	0.18
USA	5.18	5.37

Source: Mukhopadhyaya (2003)

Narayanan and Palanivel (2003) studied the wáter pollution caused by different industries during the period of 1980-1996. They reported that water pollution is primarily concentrated within a few industrial sub-sectors mainly in the form of toxic wastes and organic pollutants. Further 40-45 per cent of the total pollutants can be traced to the

processing of industrial chemicals and nearly 40 per cent of the total organic pollution to the food products industry alone (Table V).

Table V: Industrial Distribution of Water Pollution [BOD] (Per Cent Share)

Industry/Time	1980	1985	1990	1996
Chemical	5.98	7.48	7.29	8.23
Clay & Glass	0.18	0.25	0.22	0.21
Food	53.85	47.52	50.92	51.14
Metal	14.10	16.58	15.32	14.47
Paper & Pulp	7.57	8.76	7.96	7.92
Textiles	14.08	14.44	13.18	12.54
Wood	0.38	0.40	0.32	0.29
Others	3.85	4.57	4.79	5.20

Source: Narayanan and Palanivel (2003) compiled from WDR, 1999.

The present paper studies environmental issues in terms of pollution caused in the country and its impact on the health of mass population.

A. Pollution

The major indicators of environmental performance of a country includes water pollution, fossil fuel energy consumption, use of energy, electric power consumption, CO_2 gas emission, Agricultural methane emissions, nitrous oxide emissions, HFC gas emissions etc. However the present study takes into consideration only fossil fuel energy consumption, use of energy, electric power consumption, CO_2 gas emission as the data for other variable is not available in recent reports published by different international organisations. As shown from the table there is a continuous rise in almost every parameter except Energy use (kg of oil equivalent) measured per $1,000 GDP (constant 2005 PPP). Such emission is creating lots of health related problems in living substances.

Some of the indicators of environmental performance of India may be observed as follows (Table VI):

Table VI: Indicators of Environmental Performance

Year	CO_2 emissions (kt)	CO_2 emissions (metric tons per capita)	CO_2 emissions from solid fuel consumption (% of total)	Fossil fuel energy consumption (% of total)	Energy use (kg of oil equivalent) per $1,000 GDP (constant 2005 PPP)	Energy use (kt of oil equivalent)	Electric power consumption (kWh per capita)	Energy use (kg of oil equivalent per capita)
2000	1185692	1.17	66.45	65.18	255.62	459453	402.02	452.25
2001	1202858	1.16	67.00	65.11	246.46	466090	403.04	451.43
2002	1225788	1.17	68.04	65.85	244.08	478974	416.60	456.76
2003	1280865	1.20	68.23	66.17	230.83	490892	434.81	461.19
2004	1345494	1.25	69.46	67.49	225.22	518614	457.27	480.32
2005	1409973	1.29	69.92	67.93	213.27	536856	475.59	490.47
2006	1503116	1.35	70.22	68.83	204.94	563727	516.04	507.95
2007	1611042	1.43	71.19	70.07	197.01	595105	551.84	529.08
2008	NA	NA	NA	71.12	195.91	620973	566.02	544.73

Note: NA implies for Not Available

Source: World Development Report, 2011

Environmental risk has bought a considerable decline in the rate of growth, production and productivity. Central Pollution Control Board of India has indentified seventeen categories of large and medium industries as significant polluters. Further developing nations like India are more exposed to environmental threats in the form of Global Warming. This is due to their lesser efficiency to adapt to temperature. Increasing usage of coal, pollutants from industrial activities, inadequately treated sewage, household septic system, degradation of agriculture soil are

aggravating environmental risks. In addition to this the small scale sector of India has worsen the situation as they are financially and technically weak enough to adopt pollution control measures.

Health Status

Another matter of concern in this context is the growing incidence of this environmental degradation over health. The increased pollution of air and water has already threatened the livelihood of most of the species. Table VII provides the statistics related to health care issues during 2000-09 in India.

Table VII: Health Status in India

Indicator Name	Birth Rate, Crude (per 1,000 People)	Life Expectancy at Birth, (Years)	Death Rate, Crude (per 1,000 People)	Mortality Rate, Adult, Male (per 1,000 Male Adults)	Mortality Rate, Adult, Female (per 1,000 Female Adults)	Mortality Rate, Infant (per 1,000 Live Births)	Tuberculosis Case Detection rate (%, all Forms)	Prevalence of HIV, Total (% of Population Ages 15-49)	PM10, Country Level (Micrograms per Cubic meter)	Health Expenditure per Capita (Current US$)
2000	25.8	61.61	8.5	273.82	204.63	62.7	64	0.4	92.88	20.68
2001	25.4	61.97	8.4	271.70	200.81	61.1	61	0.4	88.06	22.06
2002	25	62.32	8.1	269.58	196.98	59.6	59	0.4	85.75	22.36
2003	24.8	62.67	8	267.53	193.36	58	58	0.4	79.88	24.72
2004	24.1	63.02	7.5	265.48	189.73	56.4	61	0.4	73.97	26.52
2005	23.8	63.37	7.6	263.43	186.11	54.9	61	0.4	67.24	29.97
2006	23.5	63.72	7.5	261.38	182.48	53.5	64	0.4	64.15	33.93
2007	23.1	64.07	7.4	259.33	178.86	52.1	66	0.4	59.66	42.07
2008	22.8	64.42	7.4	257.28	174.50	50.8	67	0.3	59.23	45.27
2009	22.5	64.78	7.4	255.23	170.15	49.5	67	0.3	NA	44.80

Source: World Development Report, 2011

As shown from the above table in spite of medical advancement and increasing per capita health expenditure (except for 2009) in the country, there is a rise in tuberculosis case detection rate which is an indicator of ill effects of environmental degradation in the society. The declining ratio of birth rate, declining ratio of mortality reflects the growing sensitivity of the public and advances in medical technology. Further the declining ratio of PM10 (i.e. Particulate matter concentrations which represents fine suspended particulates of less than 10 microns in diameter and are capable of penetrating deep into the respiratory tract and causing significant health damage) is also a healthy signal for India. However growing consumption of lead, mercury and cadmium has intensified the number of cancer patients in India. Further some chemicals like PCBs, DDT, dioxin as well as most of the pesticides may cause endocrine disrupters resulting into hormonal malfunctioning. The use of chemicals in different operations like electroplating operations magnifies the problem. Often, some of these chemicals are unknown to both users and traders, as they are traded as proprietary items manufactured by Chemical companies. The impact of these chemicals on the health of the workers, who are routinely exposed to these chemicals, is a matter of serious concern. Over a period of time such exposures, even at a low level, have been known to cause diseases and various infirmities (Central Pollution Control Board 2008).

Equality Indicator

Equity is an integral component of the process of sustainable development. The term equity may be understood in different context like equity in distribution of income, gender equality, regional equality, income equality and inter-

generational equality. The present paper studies first three dimensions of equity as the data for inter-generational equity could not be collected.

Gender Equality

Gender discrimination is a quite apparent issue in developing and under-developed countries. In India Government is striving hard to bridge the gap of male-female discrimination. For instance during tenth five year plan Government of India has committed itself for providing high quality employment opportunity on an equal ground. Likewise, National Strategy on sustainable development also stressed upon development of such a strategic, participatory and people centric approach which involves poor and women at every stage. However, the actual results depict the incompetence in developing opportunities to all human kind on an equitable ground. The statistics of male-female gap may be studied through table VIII.

Table VIII: Ratio of Employment to Population (E/P Ratio), Labour Participation and Adult Mortality Rate

Year	E/P Ratio (Population ages 15-24)		Overall E/P Ratio		Labour Participation Rate (Population ages 15+)		Adult Mortality Rate (Per 1,000 Respective Adults)	
	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)	Female (%)	Male (%)
2000	24.1	58.3	78.9	32.9	33	82.2	204.6272	273.8214
2001	23.7	58.2	78.90	32.8	32.8	82.1	200.8056	271.6982
2002	23.3	58.1	78.9	32.7	32.6	82	196.984	269.575
2003	23.1	58.6	78.8	32.70	32.4	81.9	193.3588	267.526
2004	22.3	57.9	78.1	32.1	32.2	81.8	189.7336	265.477
2005	22.2	57.6	77.7	32.4	32.4	81.7	186.1084	263.428
2006	22.2	57.2	77.4	32.7	32.6	81.5	182.4832	261.379
2007	22.2	56.9	77.5	32.3	32.8	81.3	178.8580	259.33
2008	22.3	56.8	77.4	32.4	33.1	81.1	174.5036	257.281
2009	21.8	56.6	NA	NA	32.8	81.1	170.1492	255.232

Source: IMF for Overall E/P ratio and WDR 2011 for employment, labour participation and mortality

The above table clearly demonstrates the male-dominance in India. According to data provided by United Nations Statistics Division, the gender gap between economic activity rate of male and female is very high in India. During 2009 the economic activity rate of male was 81 while that for females was mere 33 which caused a gender gap of 48. Gender gap in 2009 for many other countries was found very lower. For instance in China and France it was 12, Switzerland: 13, UK, Australia, New Zeeland, Germany: 14 each, South Africa: 16, Bangladesh, Japan: 24, Malaysia: 35 etc. In fact the ratio of female employed to male employed is not even 50% in any year during last decade. Further since last decade the promises to provide employment opportunity to all have still a long way to go. In fact with the exponential growth in population, rapid technological advances, all measures initiated to ensure the provision of employment to all have proven to be inadequate. Therefore, to ensure the sustainability of development more emphasis must be given to promote outcomes focusing on gender sensitive policies.

Rural-Urban Equality

Being an agrarian country a big proportion of population of India resides in rural areas. Many villages of India are still lacking proper provisioning of sanitation, steady supply of electricity and water, proper educational facilities, presence of financial services and adequate health-care facilities. In this reference the present section attempts to highlight the rural-urban disparity of India. The study of literacy level in rural and urban areas reveal that in spite of the rise in the overall level of the literacy in country, the gap of male and female is still substantial. However, since

1991 the rural-urban disparity seems to be reduced particularly for the age group of 20-35 the gap is lowest (table IX). Here it is important to note that the reason for such a positive change is not the massive rise in number of educational institutes established in rural areas but the primary cause is the growing mobility to urban areas from rural sector.

Table IX: Literacy Rate in Rural and Urban Areas (According to Age and Gender)

Age Group	1971				1991				2005-06			
	Rural		Urban		Rural		Urban		Rural		Urban	
	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male
5-9**	14.4	25.0	18.9	27.2	25.6	34.7	51.0	62.6	67.9	74.1	NA	NA
10-14	28.4	54.4	38.2	59.8	44.8	66.8	59.7	77.0	77.0	86.0	NA	NA
15-19	23.8	52.0	37.7	63.3	43.3	66.1	54.9	75.3	72.7	85.0	73.7	88.7
20-24	18.2	49.8	28.7	60.7	37.1	66.6	43.8	71.6	62.5	83.3	64.4	83.7
25-34	13.9	42.5	19.3	50.1	28.9	60.7	36.6	64.7	52.0	77.1	52.1	78.3
35 & above	7.7	35.3	10.7	38.0	14.5	44.7	22.0	52.6	34.0	65.0	40.6	69.5
All ages	13.0	34.5	18.7	39.5	24.8	46.9	39.3	64.1	53.7	75.3	NA	NA

Source: MOSPI (2011) Report using Statistics of Office of the Registrar General, India.

The survey results of National Sample Survey Office 62nd (2005-06) and 64th (2007-08) rounds as shown in the report of Ministry of Statistics and Programme Implementation, Central Statistics Office (2011) revealed that the rural-urban gap is lower for the literacy level below secondary level however the same is substantial for upper level of education. During 2007-08, there is a gap of 9.2% in the graduates of urban and rural areas (table X). This shows the inadequacy of higher education facilities in rural areas.

Table X: Literacy Rate in Rural and Urban Areas (According to Educational Level and Gender)

Educational Level	Rural			Urban		
	Female	Male	Total	Female	Male	Total
Not Literate	52.5	28.2	40.3	25.4	11.3	18
Literate without formal education	0.8	1.1	1	0.9	0.9	0.9
Below primary	7.8	9.4	8.6	5.9	5.5	5.7
Primary	14.4	17.7	16	13.2	13.3	13.2
Middle	12.3	19.9	16.2	15.9	18.8	17.4
Secondary	7.2	12.6	9.9	15.6	18.4	17
Higher Secondary	3.1	6.4	4.7	10	12.1	11.1
Diploma	0.3	0.8	0.6	0.8	2.4	1.7
Graduation	1.3	3	2.2	9.3	13.3	11.4
Post-graduation & above	0.3	0.8	0.5	3	3.9	3.5
Total	100	100	100	100	100	100

Source: MOSPI (2011) report using statistics of NSSO in India: 2007-08, 64th Round.

One important matter here is that the gender gap in terms of sex ratio in rural areas is satisfactory as compared to urban areas which demonstrate the broad mind set of rural population in India (Table XI).

Table XI: Sex Ratio

Year	Sex Ratio in Rural	Sex Ratio in Urban Areas
1901	979	910
1911	975	872
1921	970	846
1931	966	838
1941	965	831
1951	965	860
1961	963	845
1971	949	858
1981	951	879
1991	938	894
2001	946	901
2011	947	926

Source: MOSPI (2011) report using statistics of Office of the Registrar General, India.

The medical facilities in rural areas are still in miserable condition. Infant mortality rate in rural areas is still more than half of the total birth. Further the scenario of death rate and birth rate in these areas are also not satisfactory as compared to urban areas. However, during last 10 years, some improvements have been noticed in health care facilities in rural areas, they are still incapable to bridge the gap (Table XII).

Table XII: Birth, Death and Mortality Rate

Year	Birth Rate (per 1000 Population)		Infant Mortality (per 1000 Population)		Death rate (per 1000 Population)	
	Rural	Urban	Rural	Urban	Rural	Urban
2000	27.6	20.7	74	44	9.3	6.3
2001	27.1	20.3	72	42	9.1	6.3
2002	26.6	20.0	69	40	8.7	6.1
2003	26.4	19.8	66	38	8.7	6.0
2004	25.9	19.0	64	40	8.2	5.8
2005	25.6	19.1	64	40	8.1	6.0
2006	25.2	18.8	62	39	8.1	6.0
2007	24.7	18.6	61	37	8.0	6.0
2008	24.4	18.5	58	36	8.0	5.9
2009	24.1	18.3	55	34	7.8	5.8

Source: MOSPI (2011) report using statistics of Office of the Registrar General, India.

The inadequacy of proper health care facilities has been highlighted from the 58th Round survey (July-December 2002) conducted by National Sample Survey Organisation. The survey reported different type of disabilities (mental disability, physical disability, visual disability, hearing disability, speech disability and locomotors disability) among rural population.

Further, the facilities for drinking water facilities and toilets in rural areas are also unsatisfactory. The report for selected socio-economic indicators provided by Ministry of Statistics and Programme Implementation, Central Statistics Office (2011) disclosed the results of various surveys and studies conducted by different national and international organisation. The report provides the statistics from Third National Family Health Survey conducted for 2005-06. The survey was done to study the characteristics of drinking water available in rural and urban areas in terms of its source (piped water, public tap/ standpipe, dug well, spring water, rain water, tanker, surface water and bottled water. The results reveal that available water facility in urban areas is better as compared to rural areas for every variety of available water supply with the exception of water from dug well and spring. But for these type of varieties the gap is wider for unprotected water while as compared to protected water source. The survey was also

conducted to study the availability of different types of toilet facilities in rural and urban areas. The survey found that in rural areas the facility is not available in satisfactory manner.

Equality of Income

Sustainable development is a development of each and every individual of the economy. If there is lopsided development causing prosperity in the hands of few richer people, the same can never be treated as sustainable. In this context, the present section attempts to analyse the inequality of income i.e. the ratio between income of the richest to the poorest of India. Inequality in India has always been a serious threat to the nation. It may be measured by Gini Index which is based on Lorenz curve. A country is said to be having perfect equality of income if the computed value of Gini index is equal to one. Further some studies multiply the value so calculated with 100, for the sake of convenience. Larger the index, greater will be the equality of income in the country. According to IMF World Economic Outlook Report 2007, in the current phase of globalisation, there has been a surge in income inequality in most of the countries.

Jha (2004) estimated rural and urban inequality in India on the basis of NSS data. The estimate shows that both rural and urban Gini coefficients increased in the period between 1993-1994 and 1997. But it declined in the year 1997 and 1999-2000 (table XIII). But here it is very important to mention that the calculation of Gini is based n the data obtained through different rounds of survey which involve changes in the methodology and therefore the results for 1999-2000 were not comparable to earlier rounds.

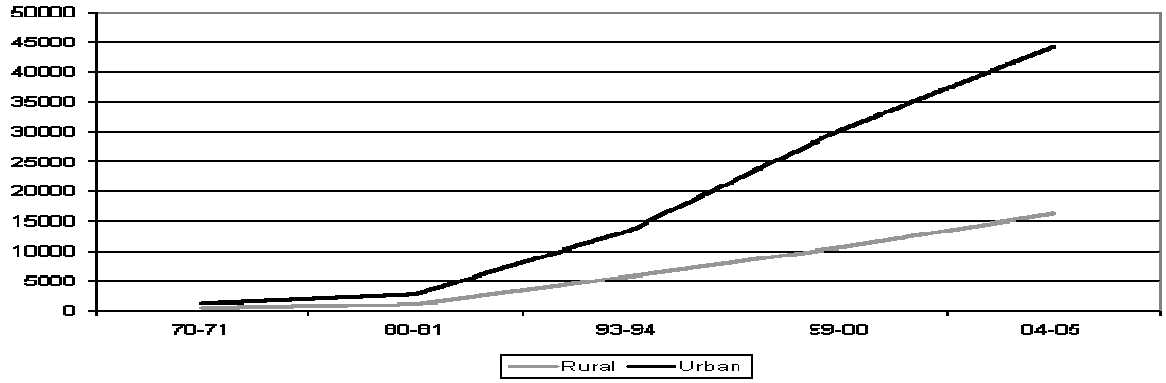
Table XIII: Trends in Rural and Urban Inequality in India

Year	Rural Gini	Urban Gini
1993-1994	28.50	34.50
1994-1995	29.19	33.43
1995-1996	28.97	35.36
1997- 1999	30.11	36.12
1999-2000a	26.22	34.40
1999-2000b	26.33	34.25

Source: Jha (2004), 1999-2000a –Using 30 day Recall Method, 1999-2000b – Using 7 day Recall, the Shorter Recall Period was used in the 55th round.

According to Global Hunger Index (2011) Report ranked India 15th, amongst leading countries with hunger situation. The proportion of population below to poverty line has shown a decline from 44.48% in 1983 to 35.97% in 1993-94. During 1999-2000 it has recorded a downfall to 26.10%. According to UN Millennium Development Goals Report, as many as 320 million people in India and China are expected to come out of extreme poverty in the next four years. It also estimates that India's poverty rate is projected to drop to 22% in 2015. Further the rural urban disparity in per capita income is also quite visible. It has gone up sharply from 1970s. During 1970-71, the ratio of urban to rural per capita income was 2.45 and remained at a low level of 2.30 during eighties and early nineties but it rose up to 2.7 and 2.8 during 2004-05 (Figure 1).

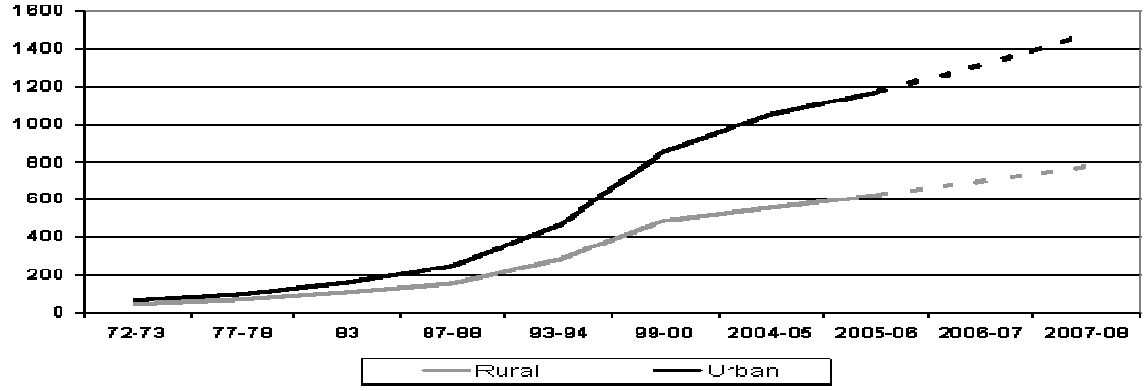
Figure 1: All-India Average per Capita Income



Source: Kundu (2010)

The trend of growing inequality can be studied through the graph plotted by Kundu (2010) for per capita consumption expenditure of rural and urban population (Figure 2).

Figure 2: Per capita Consumption Expenditure



Source: Kundu (2010)

The data explicitly reveal the inequality persisting in country. Further a steep may be observed in urban expenditures in the nineties and subsequent years.

Recommendations

India weathered the recent global oscillations in a very deliberate manner and since mid-2009 domestic demand has powered a vigorous recovery. The country's growth rate remains among the strongest in the world. In India sustainable development has been adopted as a prime agenda and many voluntary organisations are working for it. But still on the domestic front, lack of basic facilities, increased health problems, environmental degradation, gender discrimination, regional inequality and inequality of income have compelled to evaluate the cost of this development. India is an agrarian country having easy and abundant availability of agricultural based mass to generate energy, but still many regions have never experienced electricity.

According to the Human development Index 2011 India has been rated as medium developed country securing 134th rank. The estimated human development index for 2011 is 0.547 which is though better by .005 previous year index. But still it is below to the expectation. Lack of educational institutes, illiteracy, unemployment, lack of water and sanitation, high mortality rate and growing pernicious impact of environmental degradation don't allow to declare the development of India as sustainable. Undoubtedly, Government and regulatory authorities are initiating several steps to ensure SD. Like realizing the importance of biomass gasification and Renewable Energy Development Agency Limited has been created for active assistance in projects for renewable energy.

But the concept of sustainable development requires major overhauling of the entire mindset of the individual. It must seek bilateral and multi-lateral cooperation from different countries. Heavy investment in sewage and industrial waste water treatment facility should be made. Government must implement programmes for employment generation, capacity building and training to farmers using conventional mode of farming. In addition to this organic agriculture must be exploded to improve the soil fertility and farm productivity. This becomes more imperative because at present the share of Asia for having organic management is very smaller. Government of India must promote organic processing industries. Further the stringent actions must be taken against the environmental polluters, as rules and regulations don't have any sanctity without enforcement. Special Protection must be given to endangered species. Collection of Garbage, horticulture, no use of plastic bags and suitable policy to ensure the dumping of wastes, use of renewable energy equipment, minimum possible use of power and electricity are few ways to conserve our climate, resources and environment i.e. to attain sustainable development.

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The SARFAESI Act and Non Performing Assets – A Study of Private Sector Banks

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ABSTRACT

Indian banking system has made a rapid and significant progress after nationalization. The banking system gave special attention towards Branch Expansion, Loan maximization and deposit mobilization, but mass banking and social banking faced a setback in monitoring of loan. In the changing scenario of the operations of private sector bank, the non performing assets have been major problem faced by Private sector banks. The Government of India and reserve bank of India have taken various measures to curb non-performing assets. Traditionally; India's legal system has been friendly towards borrowers and famously slow and inefficient. As a result, once a bank makes a loan to an organization, it has very little bargaining power in terms of calling the loan back or getting its hands on assets that formally securitize the loan. In India, the banking sector as a whole and particularly the private sector banks till recently suffered from considerable non-performing assets. The paper studies the effectiveness of Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002 in solving the non-performing assets problems in Private sector banks. The study found that Non Performing Assets in private sector banks have been continuously declining ever since implementation of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act from 9.64% of Total Advances in 2001-2002 to 2.47% of Total Advances in 2007-2008. There is a decline of 74.34% in non performing assets in Private sector banks as a whole during the period of study. The study found that the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act was highly effective and successful in controlling and reduction of quantum of non - performing assets of private sector banks. The study recommends Indian private sector banks should continue to remain focused in their efforts to recover their non-performing assets and loans, to maintain the positive and effective trend of improving their asset quality.

Key Words: Asset Quality, Total Advances, T-test

Introduction

The banking industry is the backbone of every monetized economy in the world. The stage of development of the industry is a good reflection of the development of the economy. The banking industry in India is governed by Banking Regulation Act of India, 1949. Since 1949 this sector has undergone phenomenal reforms with the efforts and the vision of the banking policymakers. Especially it has undergone a transformation since the beginning of liberalization. The performance of the banks has improved slightly over time. The banking sector as a whole till recently suffered from considerable Non Performing Assets. The growing Non Performing Assets have been a cause of concern for the entire banking industry. As a result of this appropriation credit appraisal and inefficient recovery mechanism several banks had been reeling under high level of bad debt. But the situation has improved over time. At present, the industry is in the makeover mode. The Private sector banks are in the midst of rejuvenation process with exercises like downsizing the units, reducing the volume of Non Performing Assets.

The problem of recovery from Non Performing Assets, in the Indian banking system, was recognized by the Government of India as far back as in 1997, when the "Narasimham Committee" was appointed. The Narasimham Committee Report mentioned that an important aspect of the continuing reform process was to reduce the high level of Non Performing Assets as a means of banking sector reform. It was expected that with a combination of policy and institutional development, new Non Performing Assets in future could be lower; however, the problem of the huge backlog of existing Non Performing Assets still remained. This problem of Non Performing Assets, impinged severely

on banks performance and their profitability. The Report envisaged creation of an "Asset Recovery Fund" to take the Non Performing Assets off the lender's books at a discount.

Unlike in some countries where Assets Reconstruction Companies have been set up post financial crises and for the purpose of bailout, in India, the Government of India proactively initiated certain measures to control Non Performing Assets. In order to regulate and control the Non Performing Assets and quicken recovery, the Government of India set up Debt Recovery Tribunals and Debt Appellate Tribunals under the "Recovery of Debts Due to Banks and Financial Institutions Act, 1993. As a corollary to this and to speed up the process of recovery from Non Performing Assets, the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act, 2002, was enacted by the Government of India for regulation of Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest by secured creditors, including Securitization or Reconstruction Companies.

The Act deals with three aspects:

1. Enforcement of Security Interest by secured creditor (Banks/Financial Institutions).
2. Transfer of non-performing assets to Assets Reconstruction Company, which will then dispose of those assets and realize the proceeds.
3. To provide legal framework for securitization of assets.

One of the major problems faced by Banks/Financial Institutions in India is that of bad debts termed in glorified phrase as “Non Performing Assets” in official terminology. There are many reasons for the sorry state of affairs, major among them are:

(a) Political Interferences

(b) Poor Law Enforcement

(c) Archaic Laws and Procedures

(d) Corruption at various levels

Non-Performing Asset

An asset, including leased asset, becomes non-performing when it ceases to generate income for the bank. Earlier an asset was considered as Non-performing asset based on the concept of ***past due***. A Non-performing Asset (NPA) is defined as a credit facility in respect of which the interest and/or installment of principal has remained ‘past due’ for a specified period of time. With effect from March 31, 2001 the ***past due*** concept has been dispensed with and the period is reckoned from the due date of payment.

With a view to moving towards international best practices and to ensure greater transparency, the ’90 days’ overdue’ norm for identification of Non-performing Asset has been adopted, from the year ending March 31, 2004. A non performing asset (NPA) is a loan or an advance where;

i. Interest and /or installment of principal remain overdue** for a period of more than 90 days in respect of a Term Loan,

ii. The account remains out of order*** for a period of more than 90 days, in respect of an overdraft/ cash credit (OD/CC),

iii. The bill remains overdue for a period of more than 90 days in the case of bills purchased and discounted,

iv. The installment of principal or interest thereon remains overdue for two crop seasons for short duration crops,

v. The installment of principal or interest thereon remains overdue for one crop season for long duration crops,

vi. The amount of liquidity facility remains outstanding for more than 90 days, in respect of a securitization transaction undertaken in terms of guidelines on securitization dated February 1, 2006.

vii. In respect of derivative transactions, the overdue receivables representing positive mark-to-market value of a derivative contract, if these remain unpaid for a period of 90 days from the specified due date for payment.

Banks should, classify an account as NPA only if the interest due and charged during any quarter is not serviced fully within 90 days from the end of the quarter.

Asset Classification

The banks are required to classify non-performing assets further into the following three categories based on the period for which the asset has remained non-performing and the realizability of the dues:-

Standard Assets

Standard asset is one, which does not disclose any problems and which does not carry more than normal risk attached to the business. Such an asset should not be a Non-performing Asset.

*Sub- Standard Assets***:**

(i) With effect from 31st of March 2005, a Substandard Asset would be one, which has remained Non-performing Asset for a period less than or equal to 12 months. Thus the earlier period of 18 months has now been reduced to 12 months. In such cases, the net worth of the borrowers/guarantors or the current market values of the security charged is not enough to ensure recovery of the dues to the banks in full.

(ii) An asset where the term of the loan agreement regarding interest and principal have been re-negotiated or rescheduled after commencement of production, should be classified as sub-standard and should remain in such category for at least 12 months of satisfactory performance under the re-negotiated or rescheduled terms.

Doubtful Assets

With effect from 31st of March, 2005 an asset is classified as doubtful, if it has remained non performing asset for more than 12 months. For Tier I banks the 12 months period of classification of a Substandard Asset in a doubtful category will be effective from April 1, 2008. As in the case of Substandard Asset, rescheduling does not entitle the bank to upgrade the quality of an advance automatically. A loan classified as doubtful has all the weaknesses inherent as that classified as Substandard Asset, with the added characteristics that the weaknesses make collection or liquidation in full, on the basis of currently known facts, conditions and values, highly questionable and improbable.

Loss Assets

Loss asset is one where loss has been identified by the bank or internal or external auditors or by the Co-operation department or by the Reserve Bank of India inspection but the amount has not been written off, wholly or party. In other words such an asset is considered un-collectible and of such little value that its continuance as bankable asset is not warranted although there may be some salvage or recovery value.

Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act 2002

By the late 1990s, rising level of Bank Non-performing Asset raised concerns and Committees like the Narasimham Committee II and Andhyarujina Committee, which were constituted for examining banking sector reforms considered the need for changes in the legal system to address the issue of Non-performing Asset. These committees suggested a new legislation for securitization, and empowering banks and Financial Institutions to take possession of the securities and sell them without the intervention of the court and without allowing borrowers to take shelter under provisions of Sick Industrial Company Act/Board on Industrial Finance and Reconstruction. Acting on these suggestions, the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest (SARFAESI) Act was passed in 2002 to legalize securitization and reconstruction of financial assets and enforcement of security interest. The act envisaged the formation of asset reconstruction companies (ARCs)/ Securitization Companies (SCs).

The Act has made provisions for registration and regulation of securitization companies or reconstruction companies by the RBI, facilitate securitization of financial assets of banks, empower SCs/ARCs to raise funds by issuing security receipts to qualified institutional buyers, empowering banks and Financial Institutions to take possession of securities given for financial assistance and sell or lease the same to take over management in the event of default.

Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest) Act, 2002 provides that where any borrower makes any default in repayment secured debt or any installment thereof, and his account in respect of such debt has been classified by the secured creditor as non-performing asset, then, the secured creditor may call upon the borrower by way of a written legal notice to discharge in full, his liabilities within sixty days from the date of the notice failing which the secured creditor would be entitled to exercise all or any of the rights set out under Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act.

On the expiry of sixty days if the debt is not fully paid by the borrower, the officer(s) so authorized can enter the premises where the secured asset is lying and take its Possession. If there is resistance or there is likely to be resistance from the borrower and/or its agents in the taking over of the possession, such officer may write a request to the Chief Metropolitan Magistrate (CMM) or the District Magistrate (DM) in whose jurisdiction such secured asset is situate to take possession.

Another option available under Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act is to take over the management of the secured assets. The manner and effect of takeover has been set out under Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act. While in possession of borrowers business, the secured asset can be sold simultaneously to recover the dues.

There is an urgent need to probe what led to sudden decline in Non-performing Assets from 9.64% of Total Advances in 2001-2002 to 2.47% of Total Advances in 2007-2008 in case of Private Sector Banks. Sergio (1996) revealed that an increase in the riskiness of loan assets is rooted in a bank's lending policy and business cycle could be a primary reason for banks' NPLs. McGoven (1998) argued that 'character' has historically been a paramount factor of credit and a major determinant in the decision to lend money. Banks have suffered loan losses through relaxed lending standards, unguaranteed credits, the influence of the 1980s culture, and the borrowers' perceptions. The study of Iyer (1999) concluded that banking business is confronted to various risks like as interest risk, credit

risk, liquidity risk, market risk, operational risk, and managerial risk. But, credit risk stands out as the most detrimental among all, which lead to the pilling of non-performing assets in banks. The study of Bhattacharya (2001) rightly pointed to the fact that an increasing rate regime will attract the quality borrowers to switch over to other investment avenues like capital markets, internal accruals for their requirement of funds. Under such situations, banks would have no other option but to dilute the quality of borrowers which in turn increase the probability of generation of non-performing assets. Rajaraman and Vasishtha (2002) in their empirical study concluded an evidence of significant bivariate relationship between an operating inefficiency indicator and the NPAs problem of public sector banks. In a similar manner, largely from borrower' perspective Ranjan and Dhal (2003) explored that the non-performing loans are influenced by three major sets of economic and financial factors, *i.e.,* terms of credit, bank size induced risk preferences and macroeconomic shocks. The empirical results from panel regression models suggest that terms of credit variables have significant effect on the banks' non-performing loans in the presence of bank size induced risk preferences and macroeconomic shocks. The investigations of Mukherjee (2003) argued that in recent years the relative contribution of non-priority sector in the Non Performing Assets of banks has been increasing. Willful default and tunneling of funds being one of the most important causes of NPAs.

Research Methodology

Sample

The Indian banking industry comprises of 77 banks, out of which 15 are old private sector banks, 7 are new private sector banks, 27 are foreign banks and 28 are public sector banks. The purposive sample is taken from the banking industry. The scope of present study is restricted to the 20 Private sector banks excluding Kotak Mahindra Bank and Yes Bank as they came into existence in 2003 and 2008 respectively. The present research mainly depends upon secondary data (Gross Non Performing Assets as percentage of Total Advances) collected from the annual reports of the private sector banks for the period of seven years from 2001-02 (before enactment of Act) to 2007-08.

Objective of Study

The primary objective of the present paper is to study the effectiveness of SARFAESI Act, 2002 in solving the Non Performing Assets problem in Private sector banks. For the analysis of the data appropriate statistics has been used.

Testing of Hypothesis Using T-Test

On the basis of this sample information we want to test that Non-performing assets in Private Sector Banks have decreased by enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act. For testing the hypothesis that the enactment of the act has considerably reduced the Non-performing assets, we frame Null Hypothesis that the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act have no impact in the reduction of Non-performing assets of Private Sector Banks. i.e.

Ho : $\mu x = \mu y$

Where X is the mean value of the sample in the year 2001-2002 and μ is the mean value of the sample in the year 2007-2008.

Ha : We frame the Alternative Hypothesis that enactment and implementation of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act has reduced the volume of Non-performing assets of Private Sector Banks. i.e.

Ha : μx >μy

Data Analysis and Testing of Hypothesis

Traditionally, India's legal system has been friendly towards borrowers and famously slow and inefficient. As a result, once a bank makes a loan to an organization, it has very little bargaining power in terms of calling the loan back or getting its hands on assets that normally securitize the loan. Over the period of time, government has taken different steps to contain the Non-Performing Assets problem, but all steps have proved futile. The bankruptcy procedures for containing the level of Non-Performing Assets have been strengthened over the years. The latest step in this direction is enactment of Securitization and Reconstruction of financial Assets and Enforcement of Security Interest Act, 2002

Table I: Gross Non Performing Assets as Percentage of Total Advances of Private Sector Banks

NAME OF THE BANKS	2001-02	2007-08	% Decline
Bank of Rajasthan Ltd.	15.73	1.68	89.31
Catholic Syrian Bank Ltd.	14.88	3.88	73.92
City Union Bank Ltd.	13.20	1.81	86.28
Dhanalakshmi Bank Ltd.	15.29	2.95	80.70
Federal Bank Ltd.	11.88	2.42	79.62
ING Vysya Bank Ltd.	4.64	0.79	82.97
Jammu and Kashmir Bank Ltd.	3.62	2.53	***30.11***
Karnataka Bank Ltd.	10.43	3.42	67.20
Karur Vysya Bank Ltd.	8.97	2.03	77.36
Lakshmi Vilas Bank Ltd.	13.42	3.51	73.84
Nainital Bank Ltd.	8.68	1.85	78.68
Ratnakar Bank Ltd.	12.88	6.01	53.33
SBI Commercial and International Bank Ltd.	32.72	1.45	***95.56***
South Indian Bank Ltd.	10.05	1.78	82.28
Tamilnad Mercantile Bank Ltd.	16.47	2.25	86.33
Development Credit Bank Ltd.	9.29	1.55	83.31
HDFC Bank Ltd.	3.18	1.42	55.34
ICICI Bank Ltd.	10.23	3.30	67.74
IndusInd Bank Ltd.	7.41	3.04	58.97
AXIS Bank Ltd.	5.18	0.83	83.97
TOTAL	**228.15**	**48.50**	**1486.82**
AVERAGE	$\bar{X}$ **= 11.40**	**μ = 2.42**	**74.34**

Source: Annual reports of the banks.

Table II: Calculation of Mean (X) and Standard Deviation (S)

NAME OF THE BANKS	X	$(X - \bar{X})$	$(X - \bar{X})^2$
Bank of Rajasthan Ltd.	15.73	4.33	18.74
Catholic Syrian Bank Ltd.	14.88	3.48	12.11
City Union Bank Ltd.	13.20	1.80	3.24
Dhanalakshmi Bank Ltd.	15.29	3.89	15.13
Federal Bank Ltd.	11.88	0.48	0.23
ING Vysya Bank Ltd.	4.64	-6.76	45.69
Jammu and Kashmir Bank Ltd.	3.62	-7.78	60.52
Karnataka Bank Ltd.	10.43	-0.97	0.94
Karur Vysya Bank Ltd.	8.97	-2.43	5.90
Lakshmi Vilas Bank Ltd.	13.42	2.02	4.08
Nainital Bank Ltd.	8.68	-2.72	7.40
Ratnakar Bank Ltd.	12.88	1.48	2.19
SBI Commercial and International Bank Ltd.	32.72	21.32	454.54
South Indian Bank Ltd.	10.05	-1.35	1.82
Tamilnad Mercantile Bank Ltd.	16.47	5.07	25.70
Development Credit Bank Ltd.	9.29	-2.11	4.45
HDFC Bank Ltd.	3.18	-8.22	67.56
ICICI Bank Ltd.	10.23	-1.17	1.36
IndusInd Bank Ltd.	7.41	-3.99	15.92
AXIS Bank Ltd.	5.18	-6.22	38.68
TOTAL	**$\Sigma X = 228.15$**		**$\Sigma(X - \bar{X})^2 = 786.20$**
AVERAGE	**$\bar{X} = 11.40$**		**S =6.43**

Degree of freedom = n-1 = 20-1 = 19

$$t = \frac{|\bar{d}|}{\sqrt{S^2/n}}$$

$$t = \frac{8.98}{\sqrt{41/6}}$$

$$= 3.43$$

Table I clearly shows that the highest improvement i.e. 95.56% in NPAs has been made by SBI Commercial and International Bank Ltd., whereas the lowest improvement i.e.30.11% in NPAs has been made by Jammu and Kashmir Bank Ltd. The average NPAs in percentage of total advances before the enactment of SARFAESI Act was observed to

be 11.40, whereas it came down to 2.42 in 2007-2008. There is an average decline of 74.34% in non-performing assets in private sector banks as a whole during the period of study.

Since the Alternative Hypothesis is right tail, for checking the significance at 0.5% level of significance, for 19 degrees of freedom the tabulated value of ***t*** at 0.5% significance level is 2.861. Since the calculated value (6.10) is greater than tabulated value (2.861), we reject the Null Hypothesis and accept that the difference of means is significant and the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act has worked in positive direction in the reduction of Non-performing assets of Private Sector Banks.

Conclusion

The study found that NPAs in private sector banks have been continuously declining ever since implementation of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act from 9.64% of total advances in 2001-2002 to 2.47% of total advances in 2007-2008. There is a decline of 74.34% in non-performing assets in private sector banks as a whole during the period of study. Further SBI Commercial & International Bank Ltd stood at number one in the list of Private Sector Banks with the highest fall of 95.56% in non-performing assets over the period of study whereas ING Vysya Bank Ltd. has the least percentage of declines i.e. 30.11% fall in non-performing assets. With the help of t-test the study found that the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act were highly effective and successful in controlling and reduction of quantum of non-performing assets of private sector banks.

In the light of global meltdown, financial crunch and failure of banks and other financial institutions in foreign countries, the Government of India should ensure the strict implementation of Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act and other banking laws in order to keep the Indian banking system safe and sound and further to keep the non performing assets under control. Indian banks should continue to remain focused in their efforts to recover their non-performing assets and loans, to maintain the positive and effective trend of improving their asset quality.

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Growth and Forecasts of Foreign Direct Investment Inflows to BRIC Countries: A Comparative Study

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ABSTRACT

The present study is an attempt to compare the growth and forecasts of FDI inflows to BRIC countries. The study finds that in terms of average FDI inflows for the period of 1991-2010, India secured minimum out of the BRIC countries in spite of yielding maximum compound annual growth rate followed by Russia, Brazil and China. The study also finds that for the period of 2011-20 least square linear trend model of time series forecasts that India will grow significantly and be placed on the second position in BRIC countries but paradoxically in terms of quantity it will be positioned on the last rank. On the basis of the findings of the study it is recommended that the policy makers have to learn that to attract the investors to invest in India there is a dire need to relax the business regulations, focus on the human capital, build infrastructure and propel service sector compatible to Brazil, Russia and China. The findings of the present study are helpful for the government, foreign investors and the researchers of the area for the expansion of foreign direct investment inflows in India.

Key words: BRIC Countries, FDI Inflows, Forecasts, Growth.

Introduction

In the changing scenario the whole world has shrunk into a global village. The wave of liberalisation, privatisation and globalisation is incessantly inducing the investors to broaden the horizon of their affairs and to invest across the globe. In this process the term foreign direct investment inflows has become significant and has gained thoughtful recognition in the world, in order to have competitive infrastructure, to put economic policies into execution, to take away the technological gaps, to take on risks and to integrate economy with the global market etc. In view of the essentiality of FDI inflows, all forms of the economies irrespective of their economic profile are focusing to get hold of FDI inflows at their level best. The latest statistics of the World Investment Report (2011) of the UNCTAD signifies that during 2010, FDI inflows are more or less squarely financing the developed (51.38 per cent of the world FDI inflows) and developing/least developed (48.62 per cent of the world FDI inflows) economies of the world (UNCTAD, 2011).

The term BRIC countries comprising of Brazil, Russia, India and China is a group of four fastest growing economies of the world that are also actively after to get hold of the considerable attention of the investors around the globe. The World Investment Report (2011) exhibits that for the period of 2010, Brazil with 2.33 per cent, Russia with 1.82 per cent, India with 1.18 per cent and China with 6.51 per cent collectively holds 11.84 per cent of the total global FDI inflows. These statistics substantiates that BRIC countries are evolving as a preferable destination for the investors especially when the developed nations are facing the blows of economic crisis (Jain, 2006; Witcher and Chau, 2010). The BRIC countries are constantly in the process to outline and execute business affable norms/policies and to fetch the sizeable share of the FDI inflows than their counterparts. There is a race among the BRIC countries to get hold of FDI inflows. All this necessitates comparing the growth that has taken place and likely to happen in future in FDI inflows to these countries. In this direction the present study is conducted to compare the growth and forecasts of FDI inflows to BRIC countries.

Review of Literature

To speed up the quantum of FDI inflows, so far many studies have been conducted around the globe over the different period of time for exploring the determinants of FDI inflows in an economy. For instance, Noorbakhsh *et al.* (2001) opine that human capital is a statistically significant determinant of foreign direct investment inflows. It is one of the most important determinants and its importance has become increasingly more in time. Cho (2004) points out that the attractiveness of the economic conditions in host countries; the policy framework towards the private sector, trade and industry, and FDI and its implementation by host governments; and the investment strategies of multinational enterprises are three factors influencing FDI inflows in an economy. Rajan (2004) opines that in order for a country to be more attractive to investors, there is a need to create an enabling environment by reducing the so-called hassle costs. Biglaiser and DeRouen (2006) opine that good governance and economic reform are both the important factors influencing FDI inflows in an economy. Chakraborty and Nunnenkamp (2006) perceive that regulations need to be relaxed for inducing FDI inflows in a country. Afza and Nazir (2007) focus on the role of human resource management as a tool to improve the economic competitiveness for attracting the foreign capital inflow to boost the economic growth. Khan (2007) opines that an appropriate knowledge and market driven skills are indispensable towards achieving highly sustainable economic growth and creating a congenial environment for foreign investment. Sharma *et al.* (2009) shows that under the liberalized economic environment, investment decision of investors is based on the macro-economic policy framework, investment climate in the host country, investment policies of the transnational corporation and other commercial considerations. Nasrin *et al.* (2010) submit that governments need to create a conducive investment environment by introducing economic policies, incentives for investors, privatization and so on. Rahman (2010) find that governance, infrastructure, access to finance, international integration and human resources are the factors associated with host country influencing FDI inflows. Sharma (2011) also identifies that complexity in doing business, insufficient growth of service sector, lack of adequate infrastructure and lack of skilled manpower are significant factors influencing FDI inflows. Though various studies have been conducted over the period of time and identified the various factors/determinants influencing it. But none of the studies has been found which has compared the growth taken place in and likely to happen in future in FDI inflows to BRIC countries besides the examination of the factors influencing FDI inflows to these countries. In this direction the present study is undertaken to fill this gap and to compare the growth and forecasts of FDI inflows to BRIC countries.

Objectives of the Study

The present study has been conducted keeping in mind the following objectives:

- To compare the growth of FDI inflows to BRIC countries for the period of 1991-2010.
- To compare the forecasts of FDI inflows to BRIC countries for the coming ten years i.e. 2011-2020.
- To compare the 'business regulatory framework', 'availability of human capital', 'access of infrastructure 'and 'performance of service sector' in attracting FDI inflows to BRIC countries.

Research Methodology

The ongoing study is primarily based on the secondary data for the period 1991 to 2010. The data have been extracted from the website of UNCTAD, World Bank and International Finance Corporation. The Compound

Annual Growth Rate is computed for determining the growth rate of the FDI inflows among the BRIC economies. The least square linear trend model subject to its limitations/assumptions (ignoring the seasonal and cyclical fluctuations) is also fitted for predicting the FDI inflows to world and BRIC countries for the period of 2011-2020 in the study. Though the selection method of the time series for prediction is always subject to the nature and type of the available data but in case of cross country comparison it is hard to have homogeneous features in the data of all countries undertaken in the study. Thus, it is observed that least square linear trend model (subject to its limitations) is more appropriate and convenient to fit and predict FDI inflows than other methods of time series. The period of twenty years (1991-2010) intuitively is considered quite sufficient for predicting FDI inflows for the period of ten years (2011-2020) in the study. Further, as far as factors influencing FDI inflows are concerned, the assimilated review of the present study signifies that numerous factors have an impact over the FDI inflows of an economy. However the present study is confined arbitrarily to only four factors viz., 'business regulatory framework', 'availability of human capital', 'access of infrastructure 'and 'service sector' in attracting FDI inflows. The abbreviations used in the study are FDI inflows (Foreign Direct Investment Inflows); BRIC (Brazil, Russia, India and China); BRC (Brazil, Russia and China) and CAGR (Compound Annual Growth Rate). For the computation/statistical analysis of CAGR and prediction of FDI inflows the SPSS version 11.0 for windows has been used in the present study.

The present study has been divided into two sections. The growth for the period of 1991-2010 and prospects of FDI inflows for the period of 2011-2020 to BRIC countries for the period of 1991-2010 followed by Discussion and policy suggestions.

Growth and Forecasts of FDI Inflows to BRIC Countries

The growth and forecasts of FDI inflows to BRIC countries is covered in this section. The growth for the period of 1991-2010 is computed first in the study and afterwards the forecasts for the period of 2011-2020 are calculated in the study. As far as growth is concerned, the average FDI inflows during the period of 1991-2010, CAGR for the period of (a) 1991-2000, (b) 2001-2010 and (c) 1991-2010 are computed separately in this section.

Table I: Growth of FDI Inflows to BRIC Countries **(in US Million $)**

Year	FDI Inflows to World	FDI Inflows to Brazil	FDI Inflows to Russia	FDI Inflows to India	FDI Inflows to China
1991	154073	1102	-	75	4366
1992	165881	2061	1161	252	11008
1993	223316	1291	1211	532	27515
1994	256000	2150	690	974	33767
1995	342391	4405	2066	2151	37521
1996	388555	10792	2579	2525	41726
1997	486389	18993	4865	3619	45257
1998	707584	28856	2761	2633	45463
1999	1089597	28578	3309	2168	40319
2000	1402680	32779	2714	3588	40715
2001	826177	22457	2748	5478	46878
2002	626874	16590	3461	5630	52743
2003	572790	10144	7958	4321	53505

2004	742386	18146	15444	5778	60630
2005	982593	15066	12886	7622	72406
2006	1461863	18822	29701	20328	72715
2007	1970940	34585	55073	25350	83521
2008	1744101	45058	75002	42546	108312
2009	1185030	25949	36500	35649	95000
2010	1243671	48438	41194	24640	105735
Averag	828644.6	19313.1	15859.11	9792.95	53955.1
Rank (On the basis of Average)		**2**	**3**	**4**	**1**
(a)	28.11*	54.62*	18.21*	45.58*	21.90*
Rank (1991-2000)		**1**	**4**	**2**	**3**
(b)	10.87*	12.66*	41.03*	30.01*	10.14*
Rank (2001-10)		**4**	**1**	**2**	**3**
(c)	12.32*	17.61*	26.76*	29.72*	11.57*
Rank (1991-2010)		**3**	**2**	**1**	**4**

Note: * Significant at 5 per cent level of significance.
Source: Compiled and computed from the various years reports of the UNCTAD.

Table I shows that on the basis of average FDI inflows for the overall period (1991-2010) considered in the study China holds the apex position followed by Brazil, Russia and India. The status of India in terms of FDI inflows is around six times less than China and is half of the FDI inflows share of Brazil and Russia. To compare the growth of FDI inflows in BRIC countries, the compound annual growth rate in three parts is also computed in the present study. The first part consists of the CAGR for a period of 1991-2000. It is found that during this decade the rate of growth of FDI inflows to Brazil (54.62 per cent), Russia (18.21 per cent), India (45.58 per cent) and China (21.90 per cent) was significantly more than the growth rate of the world (28.11 per cent). During this period Brazil possessed the leading rank (1) ahead of India (2), China (3) and Russia (4) out of the economies considered in the study. The second part of the CAGR pertains to the period of 2001-2010. It is found that Brazil, the apex position rank holder of the period 1991-2000, slipped down to the fourth rank and Russia, the last rank holder of the period 1991-2000, got a first rank out of the four economies undertaken in the study. The table also exhibits that in terms of overall CAGR for the period total of twenty years (1991-2020) India with 29.72 per cent is significantly positioned on the first rank followed by Russia (26.76 per cent), Brazil (17.61 per cent) and China (11.57 per cent).

After computing growth, the forecast of FDI inflows to BRIC countries is also covered in this section. The least square linear trend model subject to its limitations/assumptions (ignoring the seasonal and cyclical fluctuations) is fitted for estimating the FDI inflows to the world and Brazil, Russia, India and China for the period of 2011-2020 in the study. The period of twenty years (1991-2010) is considered quite sufficient for estimating the projection of FDI inflows for the period of ten years (2011-2020) in the study.

Table II: Forecasts of FDI Inflows to BRIC Countries (in US Million $)

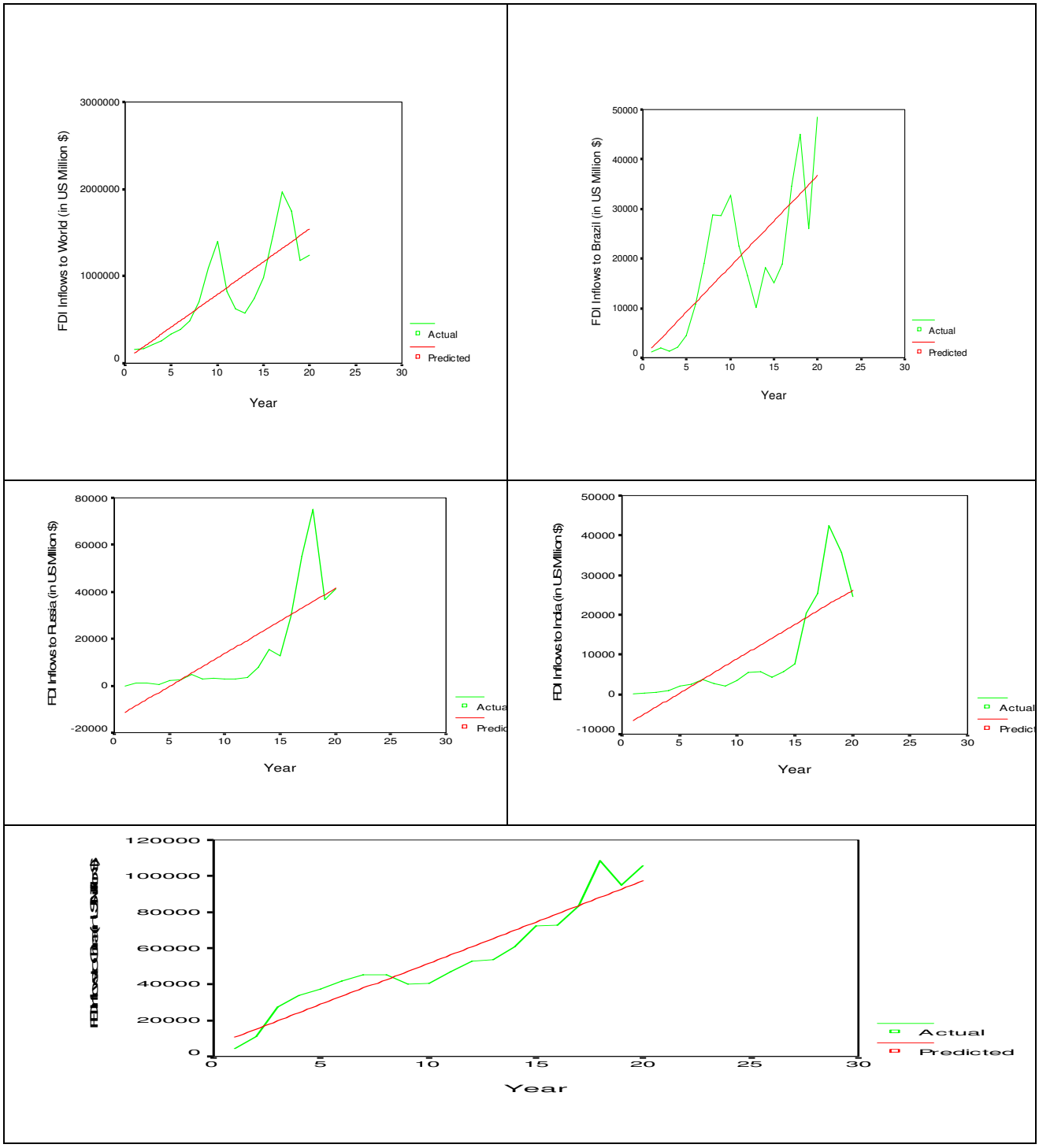
Year	FDI Inflows to World	FDI Inflows to Brazil	FDI Inflows to Russia	FDI Inflows to India	FDI Inflows to China
2011	1617706	38536	44234	27929	101854
2012	1692855	40367	47012	29656	106415
2013	1768003	42198	49790	31383	110977
2014	1843152	44028	52567	33111	115539
2015	1918301	45859	55345	34838	120101
2016	1993449	47690	58123	36565	124662
2017	2068598	49521	60901	38292	129224
2018	2143747	51351	63679	40020	133786
2019	2218895	53182	66457	41747	138348
2020	2294044	55013	69235	43474	142909
Total (2011-	**39117499**	**935492**	**1134684**	**714031**	**2447630**
Percentage of the	100	2.39	2.90	1.83	6.26
CAGR (2011-20)	3.95*	4.02*	5.08*	5.02*	3.82*
Rank (On the basis of CAGR)	**3**	**1**	**2**	**4**	**Rank (On the basis of CAGR)**

Note: * Significant at 5 per cent level of significance.
Source: Calculations are made on the basis of UNCTAD's data on FDI inflows, 2011.

The perusal of the above table and the pictorial presentation signifies that subject to the limitations/assumptions of the method of least square linear trend model for calculating the trend values with CAGR 5.08 per cent, Russia is expected to lead, followed by India with 5.02 per cent (rank 2), Brazil with 4.02 per cent (rank 3), and China with 3.82 per cent (rank 4) on the basis of estimated trend figures of FDI inflows for the period of 2011-20. The table also exhibits that though China is ranked at the last position but the percentage of the total of the FDI inflows of China with 6.26 per cent will be maximum followed by Russia with 2.90 per cent, Brazil with 2.39 per cent and India with 1.83 percent in the group.

The study finds that the forecasts of the FDI inflows to BRIC countries shows that from the point of view of CAGR India will grow significantly and be placed on the second position in its group but in terms of share (amount) in global FDI inflows it will be positioned on the last rank. It raises the question that inspite of possessing vast human resources immediately next to China the size of the FDI inflows is insufficient as it could be in Brazil, Russia and China and demands to explore the causes/factors responsible for such undesirable plight of FDI in India. As mentioned in the research methodology pertaining to the factors influencing FDI inflows are, the assimilated review of the present study signifies that various factors have an influence over the FDI inflows of an economy. However, the ongoing study is arbitrarily confined to only four factors viz., 'business regulatory framework', 'availability of human capital', 'access of infrastructure 'and 'service sector' that can attract FDI inflows in BRIC countries.

First, the comparison of regulatory framework shows that India has more stringent norms than BRC. The co-publication of the World Bank and the International Finance Corporation (2011) shows that out of 183 economies, India (rank 134) is behind China (79), Russia (123) and Brazil (127) when it comes to the 'ease of doing businesses'.



Source: The pictorial representation is made on the basis of Table II.

The analogous report also shows that in terms of 'starting a business' India (165 rank) has lower rank than Russia (108), Brazil (128) and China (151 rank). In case of 'trading across border' the similar source of evaluation submits that China (rank 50) occupies a finer position than India (100), Brazil (114) and Russia (162). Similarly, in terms of 'enforcing a contract' the plight of India is miserable in this group. The ongoing report exhibits that the status of China (rank 15) followed by Russia (18) and Brazil (98) are better than India (rank 182) in terms of 'enforcing a contract'. The identical source also shows that 1420 days are required in India to enforce a contract which is more than that of Russia (281), China (406) and Brazil (616). The report also highlights that in terms of 'getting credit'

except Russia (15) the place of India (rank 32) is almost two to three times better than China (65) and Brazil (89). Similarly in case of 'protecting investors' except Russia (rank 44), India (44) is again two fold better than Brazil (74) and China (93). Similarly, it is generally observed that investors continue to invest if they perceive the scenario as congenial for their investment. Any change that adversely affects their investment may induce them to give a second thought to their projects and to shift to some business affable environment. The 'scope of exit' notably affects their investment decisions. But unfortunately India falls in the group of the slowest economies of the list of closing a business easily. To close a business needs 7 years in India which is more than winding-up a business in China (1.7 years), Russia (3.3 years) and Brazil (4 years).

Second, the availability of educated and skilled manpower plays a vital role in an economy. But unfortunately inspite of having the largest young population all over the world even ahead of China the quality of manpower is in acute shortage in India in comparison to BRC. The results of the Human Development Report 2010, primarily based on the three indicators viz., GDP per capita, life expectancy at birth and education show that India is ranked 134 out of 182 countries of the world which is too far away from Brazil (75), Russia (71) and China (92). To improve the status of the economy it is important to focus on the education of the people but unfortunately even after more than six decades of independence the literacy rate is only 62.8 per cent which is lagging behind Russia (99.5 per cent), China (93.7 per cent) and Brazil (90.0 per cent). It is interesting to note that out of the total literacy rate the mean years of schooling are mere 4.4. The figure is exactly half of that Russia (8.4 years) and much less than China (7.5 years) and Brazil (7.2 years) (Central Statistical Organization, 2010; HDR, 2010). With this kind of low literate manpower how can we expect from foreign investors to prefer investment in India.

Third, in terms of the 'availability of adequate infrastructure' India is again not in advantageous position as compared to its counterparts. The statistics of Economic Survey 2009-10 reveals that, out of the total outlay of budgeted estimates more than forty percent expenditure of the total outlay of the government is meant for the non-development expenditures in 2009-10 in the economy which deprives the government to have sufficient funds for developing the requisite infrastructure in the economy (Economic Survey 2011). For instance, the statistics available with Human Development Report, 2010 for the growth of physical infrastructure shows that even after more than sixty four years of independence, 34.2 per cent population is without electricity in India. On the other hand, this percentage is mere 2.2 per cent in Brazil, 0.6 per cent in China and zero per cent in Russia. With this kind of inadequate infrastructure how can we expect from foreign investors to invest in India. Fourth, the growth of the service sector is instrumental for the economic development of an economy and is an attractive area to invest for the foreign investors. The statistics available with United Nations Statistical Division (2010) signifies that though service sector contributes 52 per cent to GDP in India, however the contribution of service sector in the total GDP is less than Brazil (65 per cent) and Russia (59 per cent). Only China has 40 per cent contribution of service sector in GDP but the contribution of industrial sector is maximum (49 per cent) which is almost twice than India (29 per cent) (UNCTAD, 2010). This type of insufficient growth of service sector in India still demands a lot to be done for motivating the foreign investors in the country.

Discussion and Suggestions

The objective of the study is to compare the growth and forecasts of FDI inflows to BRIC countries. The growth of FDI inflows for the period of 1991-2010 and the forecasts of FDI inflows for the next ten years i.e. 2011 -2020 are computed in the study. The study found that on the basis of average of FDI inflows for the overall period of twenty years (1991-2010) China holds the apex position followed by Brazil, Russia and India. It is also observed that the status of India in terms of FDI inflows is around six times less than China and is half of its equivalent in Brazil and Russia. But on the basis of overall CAGR for the period of total of twenty years (1991-2010) India is positioned on the first rank followed by Russia, Brazil and China. Further as far as forecasts of FDI inflows for the period of coming ten years (2011-20) are concerned it is estimated that Russia is expected to lead followed by India, Brazil and China. The study finds that the estimation of the FDI inflows to BRIC countries shows that the comparison of CAGR signifies that from the point of view of growth India will grow significantly and be placed on the second position in its group but in terms of total share in global FDI inflow it will be positioned on the last rank. It shows that inspite of possessing vast human resources immediately next to China the size of the FDI inflows is insufficient and demands to explore the causes responsible for such undesirable plight of FDI in India. A comparison of business regulatory framework of BRIC countries reveals that in terms of 'starting a business', 'ease of doing business', 'enforcing a contract' and 'closing a business' BRC have liberal business regulations than India. But in case of 'trading across border' (except China), 'getting credit' (except Russia) and 'protecting investors' (except Russia) the rank of India is better than China. Similarly in terms of human capital (literacy), physical infrastructure (electricity) and service sector (except China) India has lower rank than its counterparts.

On the basis of the findings of the comparative study it is suggested that the policy makers have to learn that to attract investors to invest in India there is a need to loosen up furthermore the business regulatory framework in accordance with the liberalized global scenario. Similarly the quality of available human capital also requires to be taken care of. The education of human resource should be the top most priority of our government. At least six per cent of the total GDP as suggested by the Central Advisory Board of Education (2005) should be meant for the education which is still deplorably not more than four per cent of the total GDP in India. Further, the availability of compatible infrastructure is another vital factor to tempt foreign investors. The economic plans and policies should ensure and enclose reasonable percentage of share of their total outlay for the development of necessary infrastructure. Last but certainly not the least, a special thought is also required for the growth of service sector in India. A sound policy exclusively designed for the escalation of service sector should be issued in accordance of the industrial and agricultural policies so as to have a vivid roadmap for inviting FDI inflows in service sector of India.

Limitations of the Study

The growth of FDI inflows in BRIC countries and their forecasts is subject to the limitations/assumptions of the least square linear trend model of the time series. The four factors/dimensions influencing FDI inflows are selected arbitrarily and many other dimensions or sub-dimensions that can affect FDI inflows and be taken up for comparison of BRIC countries have not been included in the present study. The results of the ongoing study are helpful for the government, foreign investors and the researchers of the area for the expansion of foreign direct investment inflows in India.

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Comparison of Volatility in Spot and Derivative Market: A Study Based on Descriptive Statistics & GARCH Model

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ABSTRACT

Start of Derivative trading in India is one of the major reforms in Indian capital market which took place after the liberalization of the economy. The objectives behind the start of the derivative trading were not only to stabilize the return, but also to decrease the volatility in the underlying stock market. It is a debatable issue that which of the two market possesses the higher volatility and thus more risky for the investor. This study tries to compare the volatility in spot market and derivative market to understand the market possessing higher volatility as to enable the investors to understand the nature of the two markets. Descriptive statistics as well as GARCH models have been used to compare the volatility of both the markets.

Key Words: Regulators, Volatility, Spot Market, Index

Introduction

Derivative is an instrument that derives its value from any underlying asset, which may be any debt instrument, share, loan, currency, commodity, risk instrument or any other form of security. Derivatives trading commenced in India in June 2000 after SEBI granted the approval in May 2000. Equity derivatives trading started in India on June 9, 2000 with introduction of index futures by Bombay Stock Exchange (BSE). National Stock Exchange (NSE) also commenced its trading on 12 June, 2000 based on S&P Nifty, followed by the introduction of Index options on June 4, 2001, Stock options on July 2, 2001 and Stock futures on November 9, 2001. The start of derivative trading was expected to serve as a tool for price discovery and risk management. India's derivatives market has grown tremendously since its introduction. Table I shows the Business Growth in Equity Segment in Stock Market in India It was expected by the market regulators that the introduction of derivative trading in India would not only provide risk management tools to the investors, but also discover the fair prices of the securities in the capital market. It was also expected that the start of derivative trading would stabilize the return and risk of the underlying stock market.

Various studies have been done to check whether the start of derivative trading in India has been successful in stabilizing the return and risk of the underlying stock market as well as which of the two market possesses the higher volatility so that the investors can understand the nature of both the markets for their further decision making. The present study has been conducted to compare the volatility of returns of the spot market and derivative market to find out the market possessing higher volatility.

Table I: Business Growth in Equity Segment in Stock Market in India

Year	Cash Market Segment (In Cr. Rs.)	Derivative Market Segment (In Cr. Rs.)	Total Turnover (In Cr. Rs.)
2000-01	1,339,510	2365	1,341,875
2001-02	513,167	101926	615,093
2002-03	617,989	439862	1,057,851
2003-04	1,099,535	2130610	3,230,145
2004-05	1,140,071	2546982	3,687,053
2005-06	1,569,556	4824174	6,393,730
2006-07	1,945,285	7356242	9,301,527
2007-08	3,551,038	13090477.75	16,641,516
2008-09	2,752,023	11010482.2	13,762,505
2009-10	4,138,024	17663664.57	21,801,689
2010-11	3,577,412	29248221.09	32,825,633

Source: www.nseindia.com

Review of Literature

Various studies have been done to find out which of the market possesses higher volatility. Some of the studies have the view that the spot market possesses higher volatility as compare to the derivative market, while the others declares the derivative market to be more volatile.

Choudhry (1997) measured the volatility of the return in spot market as well as in future market by GARCH model and studies the effect of short-run deviations between the cash price and future price on the volatility. His result found out a significant volatility clustering in both the markets and a strong interaction between the two markets. Peter (2001) has examined the FTSE and DAX 30 using daily data of 15 years and tried to examine the performance of the forecast of four GARCH models. His results suggested that improvement of the overall estimation were achieved when asymmetric GARCH were used. Claessen and Mittnik (2002) also examined alternative strategies for predicting stock market volatility. They found that past returns do not contain useful information beyond the volatility expectations already reflected in option price.

Gupta (2002) compared the relative volatility both in spot market and futures market in India but he could not give any conclusive evidence regarding the market where the volatility is comparatively high. Hetamsaria and swain (2003) compared the volatility of the spot and future market and establish that volatility in the two markets is found to be statistically different. Jacobsen and Dannenburg (2003) highlighted that volatility clustering is not only present in high frequency financial data, but also found to exhibit significant serial dependence in the second moments. Nath (2003) examined the behaviour of volatility in the equity market in India, for the pre and post derivatives period, using conditional variance for the period of 1999-2003. He modelled conditional volatility using different method such as GARCH. Malmsten and Terasvirta (2004) has considered different GARCH model for modelling and forecasting volatility in stock and exchange rate return.

Objectives of the Study

The present study focuses both the descriptive statistics as well as GARCH model to compare the volatility of both the market, while the most of the other studies have not considered both of them simultaneously to come at the

conclusion. The study has also been done both at the Index level as well as stock level which makes it more specific compare to the other studies. For comparing the spot market with the derivative market, both futures and option market have been considered so that comparison can be made for both of them, which have not been dealt with in most of the studies.

The main objective of the study is to test the volatility of spot and derivatives markets to estimate the volatility of spot and futures & options market separately to understand which market possesses higher volatility. Therefore an effort has been made to estimate the volatility of both spot and derivatives market so that return and volatility in spot and derivatives market can be compared. The hypothesis attempted to be tested for this objective are as follows:-

Null Hypothesis - Volatility in spot market and derivatives market i.e. futures and options market in India is indifferent.

Alternate Hypothesis - Volatility in spot market and derivatives market i.e. futures and options market in India is different.

The study will be helpful to the investor to understand the characteristics of both the market. The investors can also not only decide about the use of derivative market as a risk management tool but also plan their investments according to the investment objectives and constraints. The regulators can also review their decision in respect of start of derivative trading in India and its usefulness in meeting its objectives.

Data & Methodology

Comparisons have been made by measuring the volatility of return for NIFTY and SBI in the spot market as well as in the future market for near month, middle month and far month contract. For NIFTY, the sample period has been taken from 12th June 2000 to 27th December, 2001. For SBI, the sample period was taken from 9th November 2001 to 26th December, 2002. Comparisons have also been made by measuring the volatility of return for NIFTY in the spot market as well as in the option market for both call option and put option having strike price of Rs. 5300 for near month, middle month and far month contract. The sample period has been taken from 26th March 2010 to 24th June 2010.All the data have been collected from NSE Website (www.nseindia.com). The daily logarithmic returns are calculated from the daily closing price observations of particular index/ stock in National Stock Exchange.

Volatility in the spot market and the derivative market are measured and compared by the two approaches. The first approach deals with the time –invariant measure of volatility i.e. descriptive statistics tools like standard deviation, variance etc., The standard deviation and other descriptive statistical measure of daily index and stock return are computed and then compared among the spot market and future market and then spot market and option market. In the future market, the descriptive statistics have been calculated for all the three contracts i.e. near month contract, middle month contract and future month contract. Similarly, in the option market, descriptive statistics have been calculated for both call option and put option for all the three contracts i.e. near month contract, middle month contract and future month contract.

The second approach deals with the time variant and conditional volatility method. It deals with the modelling of time variant conditional volatility of index and stock return both in the spot and derivatives i.e. future and option market with the help of GAARCH (1, 1) framework. Along with the spot market, the modelling has been done for the three future contracts i.e. near month contract, middle month contract, far month contract as well as for the three

call and put option contracts i.e. near month contract, middle month contract, far month contract Engle in the year 1982 have developed such a model called Auto Regressive Conditional Hetroscedasticity (ARCH) in which today's expected volatility is assumed to depend upon the squared forecast errors of past days. We can say that in a linear ARCH model, the time varying conditional variance is a linear function of the past squared residuals. The return of a specific asset can be model as Auto Regressive process where the forecast errors ε_t could assume to be normally distributed with zero mean and variance h_t^2.

Therefore the mean equation, following an AR (p) process, would be

$$R_t = \alpha_0 + \sum_{i=1}^{p} \alpha_i R_{t-1} + \varepsilon_t$$

In the above equation ε_t , is conditional upon a set of lagged information and also assumed to follow normal distribution with zero mean and time –variant variance h_t^2.

According to the process the residuals (ε_t) following an ARCH (q) model, could be used to form the variance equation as follows:

$$h_t^2 = \beta_0 + + \sum_{i=1}^{q} \beta_i \varepsilon^2_{t-i}$$

As per the model, the variance of an asset depends on the past squared residuals of the return series. But the problem in this model is with the estimation of accurate number of parameters i.e. squared residuals. It is difficult to estimate model with large number of parameters, say ARCH (q). Therefore, Bollerslev in 1986 the proposed Generalised Auto Regressive Conditional Hetroscedasticity or GARCH (p,q) model.

According to the GARCH (p,q) Model, today's volatility is a weighted average of past q squared forecast errors and past p conditional variances such that

$$h_t^2 = \beta_0 + + \sum_{i=1}^{q} \beta_i \varepsilon^2_{t-i} + \sum_{j=1}^{p} \gamma_j h_{t-j}$$

β_i And γ_j, in the above equation represents respectively, the recent news coefficient and old news coefficient. If the value of γ_j is equal to zero, the GARCH (p, q) process will be converted in to an ARCH (q) process.

Facts & Findings

Disclosures based on Descriptive Statistics

Results on the volatility separately in spot and futures & option market have been compared. The volatility in both the markets has been compared with the help of some descriptive statistical measures. The descriptive statistics for the underlying NIFTY index and SBI stock in the spot market and future market have been given in the Table I. The table comprises the descriptive statistics for daily spot return and futures market return for NIFTY index from 12th

June 2000 to 27th December 2001 and SBI stock from 9th November 2001 to 26th December 2002. The future market returns have been calculated for all the three contacts i.e. near month contract, middle month contract and far month contract. These three contracts are available in the future market in the National Stock Exchange in India. Though there are different descriptive measures included in the table, only the standard deviation, skewness and kurtosis have been taken into consideration. Standard deviation represents the volatility in the return series of different indices/ stocks, skewness represents chances of positive or negative deviation from the average and kurtosis represents the chances of very large deviations.

From the table I (a) related to NIFTY index , we can see that standard deviation of Nifty return in spot market is less as compare to the all the three contracts in the futures market showing the lesser volatility in the spot market as compare to the future market. If we compare all the three future contracts, the futures contract for the middle month contract has the least volatility among the three, while the near month futures contract have the highest volatility. If we see at the skewness of NIFTY return series, it is negatively skewed in the spot market and Nifty futures far month contract and positively skewed in Nifty futures near month contract and middle month contract. If we see the extend of negative asymmetry, it has been more in the spot return series as compare to the futures contract far month contact. It means the risk of possible fall in the return is more than the possibility of any increase in the return in spot market as compare to the futures market. The kurtosis figures of all the futures contracts return series are very high as compare to that of the spot market representing that all the return series in the futures market are leptokurtic showing the chances of large deviation from its expected value as compare to the spot market.

From the Table I (b) related to SBI Stock, we can see that standard deviation of SBI return in spot market is lesser as compare to the SBI future far month contract while it is almost equal to the near month and far month contract. It shows the lesser volatility in the spot market as compare to the future far month contract. If we compare all the three future contracts, the future contract for the near month contract has the least volatility among the three. If we see at the skewness of SBI return series, it is positively skewed in the spot market as well as in the futures market for all the three contracts. If we see the extent of positive asymmetry, it has been more in the futures return far month return series. It means the possibility of possible increase in the return is more than the risk of any fall in the return in futures market far month series as compare to the spot market. The kurtosis figures of all the futures contracts return series of SBI are very high as compare to that of the spot market representing that all the return series in the futures market are leptokurtic showing the chances of large deviation from its expected value as compare to the spot market.

Table II compare the volatility in the spot market with the volatility in the option market. Descriptive statistics for the underlying NIFTY index in the spot market and option market have been given in the table. The table comprises the descriptive statistics for daily spot return and option market return for NIFTY index from 6th March 2010 to 24th June 2010. The option market returns have been calculated for both call option and put option and for all the three contacts i.e. near month contract, middle month contract and far month contract. These three contracts are available in the option market in the National Stock Exchange in India. We can see form the table that standard deviation of Nifty return in spot market is less as compare to the all the six contracts i.e. call option near month contract, call option middle month contract, call option far month contract, put option near month contract, put

option middle month contract and put option far month contract in the option market. It shows the lesser volatility in the spot market as compare to the option market. If we compare all the six option contracts, the option contract for the call option far month contract have the least volatility among the six, while the call option near month contract have the highest volatility. If we see at the skewness of NIFTY return series, it is negatively skewed in the spot market and for all the three put option contacts and positively skewed in all the three call option contracts. It means the risk of possible fall in the return is more than the possibility of any increase in the return in spot market and put option contracts as compare to the call option contracts. The kurtosis figures of all the option contracts return series are very high as compare to that of the spot market except put option middle month contract representing that most of the return series in the option market are leptokurtic showing the chances of large deviation from its expected value as compare to the spot market.

Disclosure Based on GARCH Model

Volatility in the spot market and derivatives market are measured by using GARCH (1, 1). The model has been applied to both underlying indices and stocks. NIFTY index has been taken in to consideration to measure the spot market volatility at the index level. To measure the volatility in the derivative market, it is measured for all the three future contracts i.e. near month contract, middle month contract and far month contract for NIFTY. The time period has been taken from 12th June 2000 to 27th December 2001.

Table III shows ARCH and GARCH coefficients are significant for the NIFTY in the spot market. While in the future contracts GARCH coefficients are not significant for any of the contract, while ARCH coefficient is significant for only Nifty future far month contract. This represents the more impact of recent news as compare to the older news in future market volatility. By comparing the conditional volatility in both the market on the basis of GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was lowest in case of Nifty spot market as compare to all the three futures contracts. By comparing the conditional volatility in both the market by adding the ARCH and GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was higher in case of Nifty spot market as compare to all the three future contracts. If we compare the three futures contracts, the conditional volatility was highest in the near month futures contract and it was lowest in the case of Nifty futures far month contract.

Table I(a): Descriptive Statistics for Daily Spot and Future Market Return During 12th June 2000 to 27th December 2001 - NIFTY

	NIFTY SPOT	NIFTY Future Near Month Contract	NIFTY Future Middle Month Contract	NIFTY Future Far Month Contract
Mean	-0.000894	-0.000963	-0.001012	-0.000993
Median	4.48e-05	-0.000552	-0.001030	0.000000
Maximum	0.059960	0.366984	0.308234	0.291695
Minimum	-0.063095	-0.278590	-0.234406	-0.30691
Std. Dev.	0.016005	0.029371	0.026074	0.027193
Skewness	-0.530302	2.904159	2.516508	-1.355603
Kurtosis	4.830655	90.57585	74.42191	70.91466
Jarque Bera	71.99188	117143.8	77109.90	71028.67
Probability	0.000000	0.000000	0.000000	0.000000
Obs.	386	365	361	369

SBI stock has been taken in to consideration to measure the spot market volatility at the stock level. To measure the volatility in the derivative market, it is measured for all the three future contracts i.e. near month contract, middle month contract and far month contract for SBI. The time period has been taken from 9th November 2001 to 26th

December 2002.Table IV shows ARCH and GARCH coefficients are significant for the SBI in the spot market as well as for all the future contracts.

Table I(b): Descriptive Statistics for Daily Spot and Future Market Return during 9th November 2001 to 26th December 2002 - SBI

	SBI SPOT	SBI Future Near Month Contract	SBI FUTURE Middle Month Contract	SBI Future Far Month Contract
Mean	0.001230	0.001211	0.001278	0.001311
Median	-9.52e-05	-0.000215	0.000000	0.000000
Maximum	0.095352	0.102806	0.099434	0.193761
Minimum	-0.105229	-0.106304	-0.116756	-0.143394
Std. Dev.	0.019861	0.019643	0.019737	0.026920
Skewness	0.433616	0.560808	0.117249	0.989037
Kurtosis	8.559731	9.473787	10.14657	24.52842
Jarque Bera	369.3981	503.6260	596.4982	5413.883
Probability	0.000000	0.000000	0.000000	0.000000
Obs.	280	280	280	278

By comparing the conditional volatility in both the market by GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was lowest in case of SBI spot market as compare to the three future contracts. By comparing the conditional volatility in both the market by adding the ARCH and GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was highest in case of SBI spot market as compare to the three futures contracts. If we compare the three futures contracts, the conditional volatility was highest in the SBI middle month futures contract and it was lowest in the case of SBI futures far month contract.

Table II: Descriptive Statistics for Daily Spot and Option Market Return during 26th March 2010 to 24th June 2010 - NIFTY

	NIFTY SPOT	NIFTY Call Near Month Contact	NIFTY Call Middle Month Contact	NIFTY Call For Month Contact	NIFTY Put Near Month Contact	NIFTY Put Middle Month Contact	NIFTY Put Far Month Contact
Mean	0.000117	-0.026103	-0.003292	-0.001476	-0.123367	-0.004617	-0.019707
Median	0.001857	-0.144169	-0.020457	-0.003417	-0.045574	-0.004440	0.000000
Maximum	0.034386	7.406103	1.134635	0.552501	1.195654	0.454800	0.320404
Minimum	-0.029354	-4.077537	-0.543012	-0.320958	-5.342334	-0.495435	-1.161413
Std. Dev.	0.011998	1.475753	0.252744	0.168543	0.781274	0.188793	0.207385
Skewness	-0.098371	2.861904	1.530975	0.678695	-4.825964	-0.005855	-2.824922
Kurtosis	3.493757	17.26463	8.508936	4.037473	33.53291	2.890681	16.29676
Jarque Bera	0.729801	610.2908	100.9650	7.540389	2648.997	0.031227	539.2051
Probability	0.694266	0.000000	0.000000	0.023048	0.000000	0.984508	0.000000
Obs.	62	62	61	62	62	62	62

Table V compares the volatility in the spot market with the volatility in the option market at the index level. To measure the volatility in the derivative market, it is measured for all the three option contracts i.e. near month contract, middle month contract and far month contract for NIFTY. It has been measured for call option as well as for put option. The time period has been taken from 6th March 2010 to 24th June 2010. The table shows that GARCH coefficient is significant for NIFTY spot market, while in case of option market, it was significant for Nifty call middle month contract, Nifty put near month contract and Nifty put far month contract.

Table III: Spot Market & Futures Market Return Volatility Under Simple GARCH during 12th June 2000 to 27th December 2001 - NIFTY

Index	Conditional Mean Equation $Spot_t = \alpha_0 + \sum_{i=1}^{2} \alpha_i Spot_{t-1} + \varepsilon_t$				Conditional Variance Equation $h_t = \beta_0 + \beta_1 \varepsilon^2_{t-1} + \beta_2 h_{t-1}$		
	$C\alpha_0$	AR(1) α_1	AR(2) α_2		C β_0	ARCH (1) β_1	GAARCH (1)β_2
NIFTY SPOT							
Coefficient	0.000796	0.235688	-0.110298		5.22E-05	0.595252	0.312233
Z- statistics	1.08525	3.492512	-2.096109		4.388629	4.933799	4.439495
p value	0.2778	0.0005	0.0361		0	0	0
NIFTY FUTURE NEAR MONTH CONTRACT							
Coefficient	0.00012	0.140651	0.077154		0.000479	-0.007178	0.657962
Z- statistics	0.034353	2.189913	0.71232		0.656415	-0.413738	1.252288
p value	0.9726	0.0285	0.4763		0.5116	0.6791	0.2105
NIFTY FUTURE MIDDLE MONTH CONTRACT							
Coefficient	-0.000668	0.17333	-0.066933		0.000397	-0.003773	0.61465
Z- statistics	-0.241715	3.225584	-0.721522		0.416639	-0.19673	0.663694
p value	0.809	0.0013	0.4706		0.6769	0.844	0.5069
NIFTY FUTURE FAR MONTH CONTRACT							
Coefficient	-0.000922	0.004967	-0.011261		0.00047	-0.01205	0.576492
Z- statistics	-0.414628	0.041626	-0.214763		0.696159	-16.92675	0.942845
p value	0.6784	0.9668	0.83		0.4863	0	0.3458

The ARCH coefficient is not significant for NIFTY spot market, while in case of option market, it was significant for Nifty call middle month contract, Nifty put near month contract and Nifty put middle month contract. By comparing the conditional volatility on the basis of GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was highest in case of Nifty Spot market.

Table IV: Spot Market & Future Market Return Volatility under Simple GARCH During 9th November 2001 to 26th December 2002 - SBI

Stock	Conditional Mean Equation $Spot_t = \alpha_0 + \sum_{i=1}^{2} \alpha_i Spot_{t-1} + \varepsilon_t$				Conditional Variance Equation $h_t = \beta_0 + \beta_1 \varepsilon^2_{t-1} + \beta_2 h_{t-1}$		
	$C\alpha_0$	AR(1) α_1	AR(2) α_2		C β_0	ARCH (1) β_1	GAARCH (1)β_2
SBI SPOT							
Coefficient	0.00091	-0.083277	-0.104376		5.86E-06	0.084414	0.905034
Z- statistics	1.037161	-1.30925	-1.482832		3.001715	4.140122	51.62644
p value	0.2997	0.1904	0.1381		0.0027	0	0
SBI FUTURE NEAR MONTH CONTRACT							
Coefficient	0.001008	-0.086512	-0.091831		5.48E-06	0.075048	0.913
Z- statistics	1.019797	-1.307721	-1.366003		3.054804	3.777735	48.98323
p value	0.3078	0.191	0.1719		0.0023	0.0002	0
SBI FUTURE MIDDLE MONTH CONTRACT							
Coefficient	0.000906	-0.073138	-0.08524		3.58E-06	0.048302	0.939977
Z- statistics	1.02828	-1.133479	-1.204077		2.022651	2.759731	50.04239
p value	0.3038	0.257	0.2286		0.0431	0.0058	0
SBI FUTURE FAR MONTH CONTRACT							
Coefficient	0.001131	-0.124108	-0.071779		2.92E-05	0.041082	0.926467
Z- statistics	0.973838	-1.508677	-0.593277		13.44559	5.426159	178.8237
p value	0.3301	0.1314	0.553		0	0	0

Table V: Spot Market & Option Market Return Volatility under Simple GARCH During 26th March 2010 to 24th June 2010 - NIFTY

Index	Conditional Mean Equation $Spot_t = \alpha_0 + \sum_{i=1}^{2} \alpha_i Spot_{t-1} + \varepsilon_t$				Conditional Variance Equation $h_t = \beta_0 + \beta_1 \varepsilon^2_{t-1} + \beta_2 h_{t-1}$		
	$C\alpha_0$	AR(1) α_1	AR(2) α_2		C β_0	ARCH (1) β_1	GAARCH (1)β_2
NIFTY SPOT							
Coefficient	0.00045	-0.044289	-0.053629		8.14E-07	-0.074461	1.092764
Z- statistics	0.384828	-0.309473	-0.336846		0.083316	-0.838025	6.384691
p value	0.7004	0.757	0.7362		0.9336	0.402	0
NIFTY CALL OPTION NEAR MONTH CONTRACT							
Coefficient	-0.06425	-0.344307	-0.009011		0.596854	0.648479	-0.191561
Z- statistics	-0.687809	-18.96282	-0.105974		0.745382	1.676533	-0.117691
p value	0.4916	0	0.9156		0.456	0.0936	0.9063
NIFTY CALL OPTION MIDDLE MONTH CONTRACT							
Coefficient	0.00061	0.031835	-0.050841		0.019879	-0.061107	0.788031
Z- statistics	0.015631	0.148114	-0.558336		0.748968	-2.311465	2.278795
p value	0.9875	0.8823	0.5766		0.4539	0.0208	0.0227
NIFTY CALL OPTION FAR MONTH CONTRACT							
Coefficient	0.001298	-0.126285	0.026068		0.010967	-0.014359	0.647251
Z- statistics	0.05542	-0.738693	0.149439		0.386368	-0.129414	0.668638
p value	0.9558	0.4601	0.8812		0.6992	0.897	0.5037
NIFTY PUT OPTION NEAR MONTH CONTRACT							
Coefficient	0.021238	-0.066936	-0.178062		-0.010421	1.141794	0.591353
Z- statistics	0.422585	-0.298879	-0.822049		-0.331648	2.465659	3.417814
p value	0.6726	0.765	0.411		0.7402	0.0137	0.0006
NIFTY PUT OPTION MIDDLE MONTH CONTRACT							
Coefficient	-0.005737	-0.232705	0.132347		0.02148	-0.18154	0.583785
Z- statistics	-0.2438	-1.674754	0.738488		1.072171	-3.979336	1.105726
p value	0.8074	0.094	0.4602		0.2836	0.0001	0.2688
NIFTY PUT OPTION FAR MONTH CONTRACT							
Coefficient	-0.01534	-0.049719	-0.0589		0.00279	-0.13891	1.004585
Z- statistics	-1.002676	-0.356511	-0.475202		0.473092	-1.665388	4.035353
p value	0.316	0.7215	0.6346		0.6361	0.0958	0.0001

By comparing the conditional volatility in both the market by adding the ARCH and GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was highest in case of Nifty Spot market except Nifty put option near month contract. It was lowest in the case of Nifty put option middle month contract.

Conclusions

It was found that volatility in spot market is less as compare to the all the three contracts in the future market at the index level. Comparing all the three future contracts at the index level, the futures contract for the middle month contract have found to be the least volatile among the three, while the near month futures contract found to have the highest volatility. The same results were found at the stock level, when the volatility of spot market was compared with the future market. While comparing the spot market and option market, the lesser volatility was found in the spot market as compare to all types of contracts in the option market Among all six types of option contracts, call option far month contract found to have the least volatility among the six, while the call option near month contract found to have the highest volatility.

Comparing spot market with the futures market at the index level, ARCH and GARCH coefficients are found to be significant in the spot market. While in the futures contracts, GARCH coefficients are not significant for any of the contract, while ARCH coefficient is significant for only futures far month contract. This represents the more impact of recent news as compare to the older news in futures market volatility. By comparing the conditional volatility in both the market on the basis of GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was lowest in case of Nifty spot market as compare to all the three future contracts. Comparing the volatility in the spot market and futures market at the stock level, ARCH and GARCH coefficients are found to be significant in the spot market as well as for all the future contracts. By comparing the conditional volatility in both the market by GARCH coefficient in the conditional volatility equation, it has been found that conditional volatility was lowest in case of spot market as compare to the three futures contracts. Comparing the spot market with the option market, GARCH coefficient found to be significant for spot market, while in case of option market, it was significant for call option middle month contract, put option near month contract and put option far month contract. The ARCH coefficient is not significant for spot market, while in case of option market, it was significant for call option middle month contract, put option near month contract and put option middle month contract.

After being estimating the volatility separately in spot and derivative markets, it can be undoubtedly concluded that the returns in the spot market are less volatile as compare to the returns in future market. It is also concluded that the returns in the spot market are also less volatile as compare to the returns in option market. Not only the time invariant volatility measured i.e. standard deviation, but also the conditional volatility in the spot market found to be less for the underlying indices/stocks. In this way, it can be said that volatility in spot market and derivatives market i.e. futures and options market in India is different.

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Global Financial Crisis and its Impact on India's GDP Growth

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ABSTRACT

Making use of Quarterly estimates of GDP for the last 14 years (from Q1:1996-97 to Q2:2010-11), an attempt has been made to analytically examine the impact, if any, of the ongoing global financial crisis on India's income as derived through nine different activities, so as to devise suitable policies from the point of view of employment generation. After duly splicing the time series available at differential base years, computations of Quarterly Rates of Growth were made in different components of income. Through Loess-based non-linear decomposition approach of the time series due to Cleveland et al. (1990), turning points were located (by following Sethi 2008, 2010) in the temporal paths of relative growth rates in each of the components. The analysis has revealed that primary producing activities (like Agriculture, Mining & Quarrying, and Manufacturing) have been adversely affected over a span of time. Besides, there has been a deceleration in growth pattern of labour-absorbing activities (like Construction, and Trade, Hotels & Restaurants). Continually growing capital-intensive activities (like Electricity, Gas & Water Supply) and activities involving skilled work-force (like Banking/ Insurance), coupled with deceleration in labour-intensive activities (like Agriculture, Manufacturing, Construction, and Hotels & Restaurants) have aggravated the problem of Job-less Growth. There is thus an urgent need to adopt suitable policy measures so as to promote primary producing and labour-absorbing activities. Strengthening of small-sector and agro-based industry would possibly be a step in the right direction to ensure inclusive growth.

Key words: GDP, Gompertz, Logistic, Manufacturing, Aggregated Income

Introduction

Global Financial Crisis got triggered off primarily due to bad policies of *sub-prime lending* at fairly low rates in the United States. Subsequently, increased rates of interest, falling demand and deteriorating actual value of the otherwise inflated mortgage values of assets and real estate & dwellings' values made the sub-prime borrowers unable to repay their loans. Large many of such borrowers became defaulters, resulting in high volumes of NPAs of the financial institutions. In the absence of any stringent mechanism to make recoveries of the borrowings, a number of prestigious financial institutions in the U.S. (like Lehman Brothers, City Bank, HSBC, Merrill Lynch, AIG, Golden Sachs, Morgan Stanley, *etc.*) turned bankrupt and got collapsed. The resulting financial crisis induced a depressing effect in a spiraling manner on the economies world over, in general, and on European Union as also on close allies of U.S., in particular. The impact has been immense on economies (like Greece, Portugal, Ireland, Italy and Spain, which have cried loudly for relief packages to cope with their sovereign debt), operating under market capitalism, and those having high degree of liberalization and openness. Even the rapidly emerging economies like China felt the heat. India, of course, has been no exception. However, the impact of the crisis among nations has been differential in nature, depending upon their shock absorbing capabilities. Even within an economy, certain sectors are expected to have been more vulnerable to the shock than the others. The present paper aims at in this very direction in the context of the Indian economy.

Data

The study was based on time-series data on nine major aggregates of India's quarterly GDP for 14 years, *viz.,* from Q1:1996-97 to Q2:2010-11, compiled through various issues of *National Accounts Statistics* of the *C.S.O.* at both current & at constant prices [For methodology of estimation of quarterly GDP, please refer to Kolli (2008)]. The constant price data were available differently at 1999-2000 base and 2004-05 base; the two were duly spliced together (by following Chou, 1975; Croxton *et al.*, 1973) to have a comparable series at the latter base. It may be

mentioned that the analysis was based upon quarterly estimates rather than the annual estimates because of two reasons: (a) To have some assessment of post-meltdown picture; and (b) to have increased number of degrees of freedom for estimation. The aggregates of QGDP were: (1) Agriculture, Forestry & Fishing (AFF); (2) Mining & Quarrying (MNQ); (3) Manufacturing (MFG); (4) Electricity Gas & Water-Supply (EGW); (5) Construction (CON); (6) Trade, Hotels, Transport & Communication (THC); (7) Financing, Insurance, Real-Estate & Business Services (FRB); (8) Community, Social & Personal Services (CSP); and (9) Aggregated Income (AGG).

Computations and Findings

For each of aggregates, quarterly rates of growth were computed as

$$R_{i\,t} = \frac{Y_{i\,t} - Y_{i\,t-1}}{Y_{i\,t-1}} \times 100;\ i = 1, 2, 3, 4$$

Table I: Quarterly Rates of Growth in Different Components

Comp.	Quarter	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
AFF	Q1	-0.80	3.44	4.76	0.42	2.98	-1.35	0.02	4.41	3.19	3.08	3.14	3.22	1.86	2.55
	Q2	1.77	3.72	1.46	5.63	5.95	-5.18	7.53	1.49	3.88	2.95	3.85	2.42	0.87	4.39
	Q3	-3.43	5.81	-0.85	-0.69	6.99	-12.12	19.22	-4.60	7.78	3.76	8.65	-1.40	-1.77	
	Q4	-5.69	10.46	-1.66	-4.36	8.75	-8.17	10.67	3.60	5.19	4.66	2.13	3.26	0.69	
MNQ	Q1	9.40	4.68	1.97	3.87	-1.83	11.76	1.21	13.98	4.14	6.36	1.08	2.58	8.16	8.43
	Q2	10.92	4.23	5.80	2.63	0.48	10.08	0.89	11.53	-2.06	7.65	4.65	1.61	10.07	7.97
	Q3	10.56	1.98	3.28	3.32	4.35	7.37	2.58	11.42	0.03	9.82	4.45	2.76	9.55	
	Q4	8.30	0.46	6.31	0.11	3.56	6.78	7.14	9.53	3.04	10.69	5.08	-0.34	14.00	
MFG	Q1	0.37	2.96	3.54	9.14	2.07	4.57	5.81	3.79	11.16	14.68	12.07	5.41	4.27	12.48
	Q2	2.09	2.82	4.35	8.14	2.25	7.28	6.60	5.48	8.55	15.12	10.32	5.27	9.29	8.86
	Q3	2.70	1.47	4.57	8.22	2.59	7.41	6.68	6.33	8.69	14.18	10.71	1.31	13.76	
	Q4	0.64	3.14	5.32	5.71	3.20	7.86	7.34	4.99	9.91	15.75	8.32	0.55	16.28	
EGW	Q1	6.76	10.00	4.31	2.99	1.00	5.21	4.05	2.83	8.66	8.30	10.17	3.27	6.56	6.09
	Q2	10.41	5.23	10.03	0.34	2.52	4.81	2.11	5.76	3.98	10.63	9.14	4.30	7.70	3.39
	Q3	5.14	6.05	6.87	5.12	0.90	5.81	4.10	1.08	6.30	11.63	7.05	4.03	4.68	
	Q4	8.90	6.28	5.97	-0.12	2.52	3.20	8.81	-0.66	7.46	9.46	7.84	4.09	7.10	
CON	Q1	9.43	8.58	3.35	11.32	0.14	7.20	10.15	21.38	10.71	11.62	10.68	6.70	7.69	11.04
	Q2	7.94	6.42	2.93	8.89	1.23	9.61	16.57	16.78	9.61	10.57	13.10	4.28	7.62	9.54
	Q3	13.50	3.98	3.20	7.16	5.36	7.68	10.07	23.26	14.69	9.38	9.64	2.98	6.11	
	Q4	9.68	5.62	6.11	-1.35	9.09	7.42	11.31	21.51	14.27	10.74	7.05	5.61	8.73	
THC	Q1	7.20	6.93	8.00	9.37	8.08	9.13	8.11	11.83	12.90	11.02	11.87	10.30	5.99	10.51
	Q2	8.28	9.87	7.96	7.88	9.10	9.94	10.36	14.31	11.93	12.65	9.55	9.82	8.74	11.59
	Q3	7.83	6.84	7.81	6.93	9.22	8.43	14.59	9.30	11.44	11.97	10.69	4.37	10.17	
	Q4	7.30	7.43	8.72	5.25	10.22	10.26	14.33	15.15	12.07	11.06	10.85	5.70	12.36	
FRB	Q1	11.57	5.05	8.74	5.01	7.22	8.71	4.95	5.50	11.50	14.14	13.97	9.17	11.74	7.90
	Q2	10.46	6.77	9.16	4.03	7.71	8.87	5.59	4.35	13.12	14.48	13.78	8.91	11.14	8.43
	Q3	11.16	8.71	9.21	3.29	7.66	7.83	5.69	6.38	11.73	15.22	13.34	10.21	7.86	
	Q4	12.89	8.46	7.50	3.98	6.57	6.64	6.03	7.26	14.74	14.18	11.88	12.26	7.90	
CSP	Q1	3.91	16.22	14.75	1.03	5.70	4.56	8.51	9.98	7.12	5.99	4.16	8.75	7.62	7.93
	Q2	6.19	24.33	9.09	8.05	2.54	4.63	13.8	3.83	7.72	2.95	7.01	10.35	13.97	7.27
	Q3	11.55	9.42	16.94	7.84	7.85	3.83	4.83	6.57	8.24	1.31	5.32	28.65	0.82	
	Q4	16.83	-0.95	13.00	2.51	1.38	3.03	-2.91	12.38	7.38	0.90	9.80	8.78	1.59	
GDP	Q1	4.33	6.28	6.84	5.24	4.50	5.25	5.44	8.37	9.25	9.81	9.35	7.33	6.45	8.75
	Q2	5.92	8.13	6.05	6.62	5.18	5.57	8.92	7.47	8.91	10.13	9.39	7.19	8.89	8.68
	Q3	4.61	5.91	5.61	4.51	6.68	2.10	10.94	5.53	9.69	9.38	9.73	6.24	6.39	
	Q4	5.24	5.82	5.91	1.84	6.34	3.82	7.99	9.68	9.99	9.59	8.49	5.76	8.57	

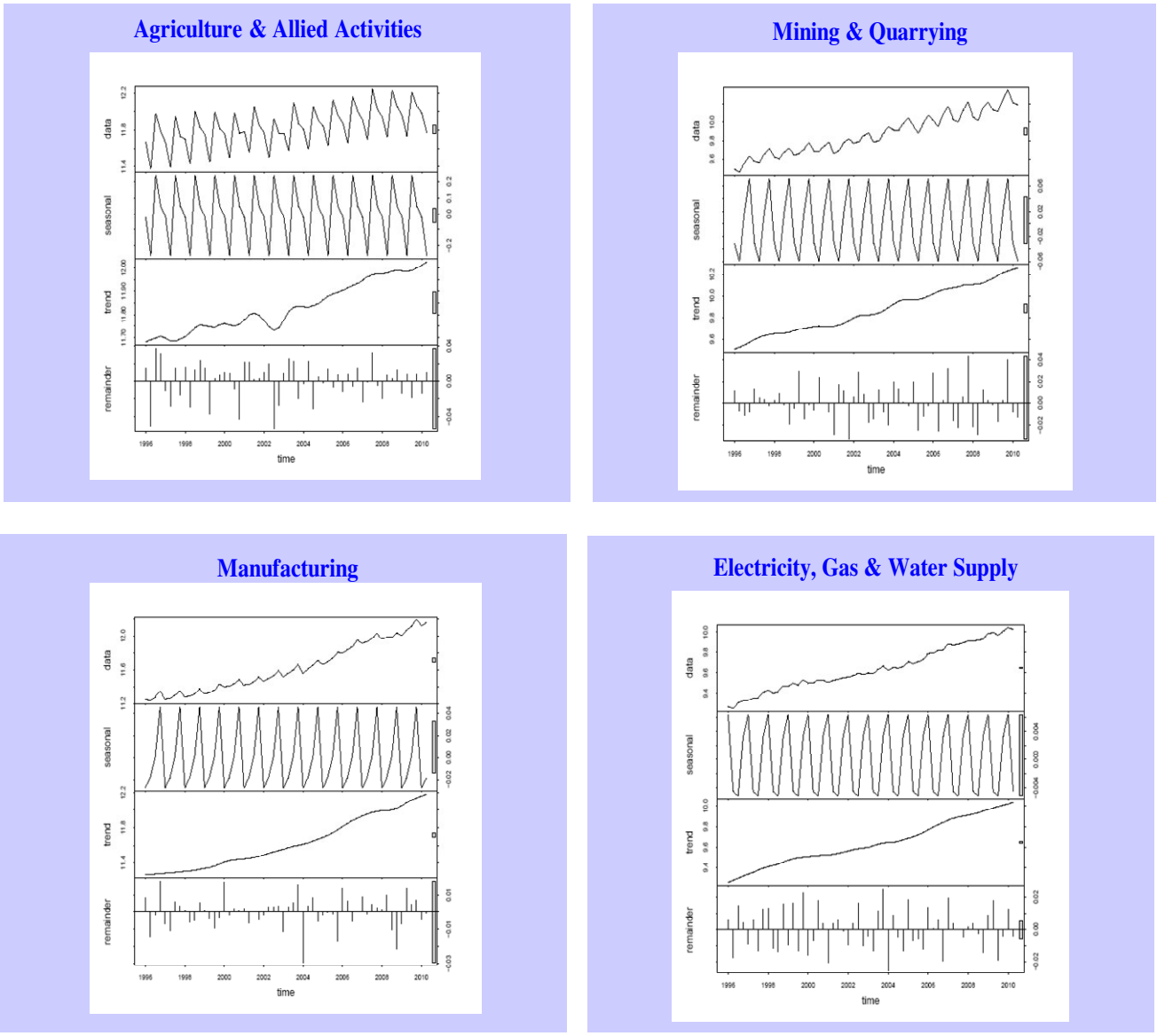
The rates have been presented in Table I. A glance at the table clearly indicates that the rates experienced very wide fluctuations. In AFF, for instance, the rate during the third quarter was as low as -12.1 percent during 2001-02, and jumped to as high as 19.2 percent during the year 2002-03. Similarly, during the year 1997-87, the CSP sector experienced growth at widely ranging rates of 16.2, 24.3, 9.4 and -1.0 percent during Q_1, Q_2, Q_3, and Q_4, respectively. In the presence of fluctuations of such a magnitude in the quarterly rates of growth, nothing concrete could be concluded, thereby calling for the need to carry out further analysis.

For each of the 9 aggregates, non-linear decomposition of the time series (into seasonal changes, log-trend, and random fluctuations) was made through Loess based approach due to Cleveland *et al*. (1990), as depicted in Figure 1. For each aggregate, the figure depicts 4 sub-parts. The top-most part represents the available time series, the second depicts seasonal changes, the third-one provides trend (on log-scale) and the bottom-most part portrays random fluctuations.

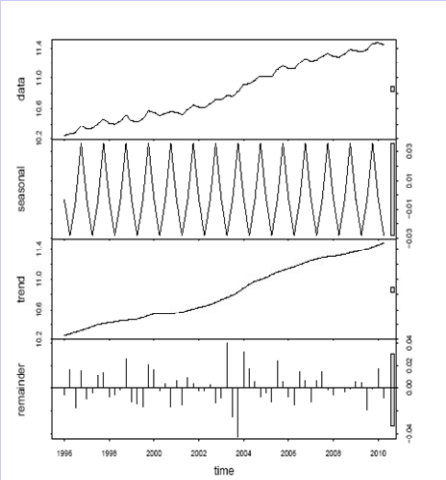
The trend components were isolated (Table II), and were subjected to the estimation of *fourteen* alternative behavioural paths: 1. Simple Linear (SLR); 2. Parabolic (PRB); 3. Cubic (CUB); 4. Exponential (EXP); 5. Exponential Parabolic (EPB); 6. Exponential Cubic (ECB); 7. Log-linear (LLN); 8. Log-parabolic (LPB); 9. Log-cubic (LCB); 10. Geometric (GEO); 11. Hyperbolic (HYP); 12. Modified Exponential (MEX); 13. Gompertz (GOM); and 14. Logistic (LGS). Following Sethi (2008), the optimum paths were identified for each of the components, and *relative growth rates* were estimated. Then, following Sethi (2010), turning points were located in the temporal paths of the relative growth rates in each of the components, and were portrayed graphically (Figure 2).

As per Figure 2, Agriculture and Allied Activities had a turning point during the 2nd quarter of 2008, with deceleration thereafter. More or less, a similar was the pattern in respect of (a) Mining & Quarrying, and (b) Manufacturing. Construction and Trade, Hotels, Transport & Communication showed a deep deceleration after the turning point detected during mid-2004. Notably, however, there were no signs of adverse impact on activities like Electricity, Gas & Water Supply, Financing, Insurance, Real-Estate & Business Services, Community, Social & Personal Services, and aggregated quarterly income. These findings (on resistivity of FRB sector) might look strange; some of likely reasons could be: (a) Prevalence of a strong

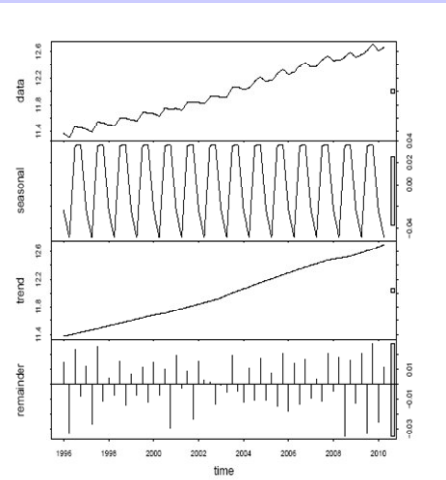
Figure 1. Non-linear Decomposition of the Time Series on Various Components of Quarterly GDP through Loess Based Approach.



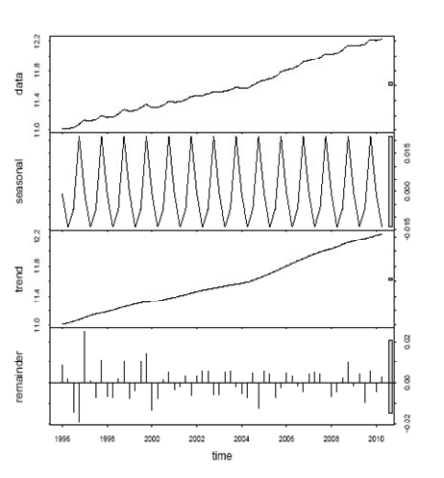
Construction



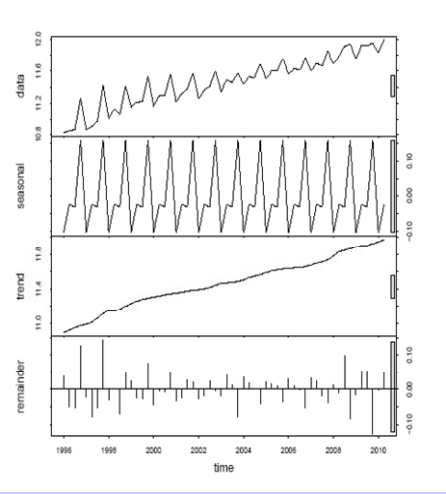
Trade, Hotels, Transport and Communication



Financing, Insurance, Real Estate and Business Services



Community, Social & Personal Services



Gross Domestic Product

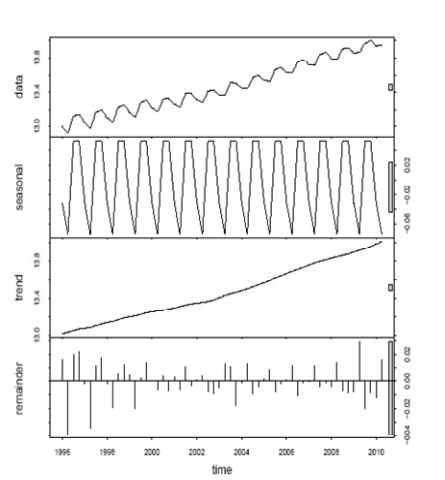
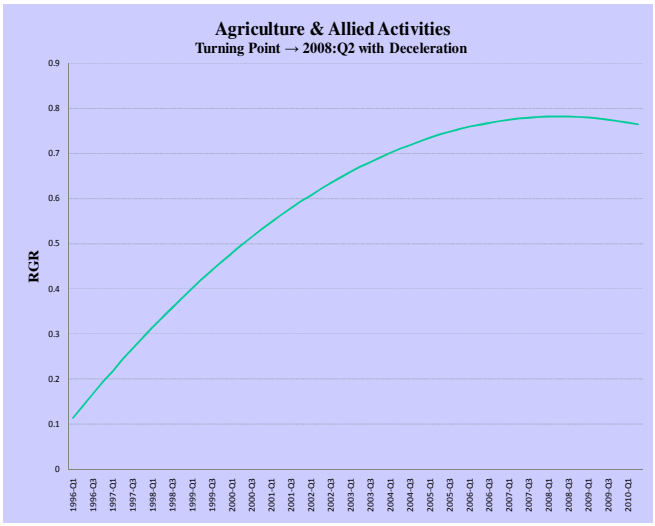
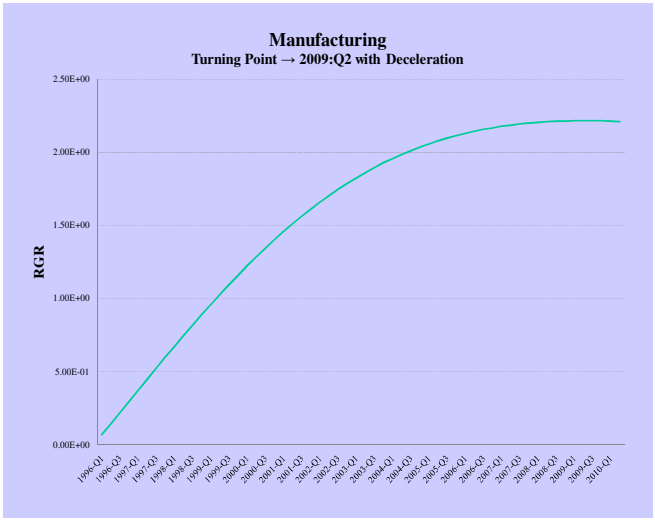


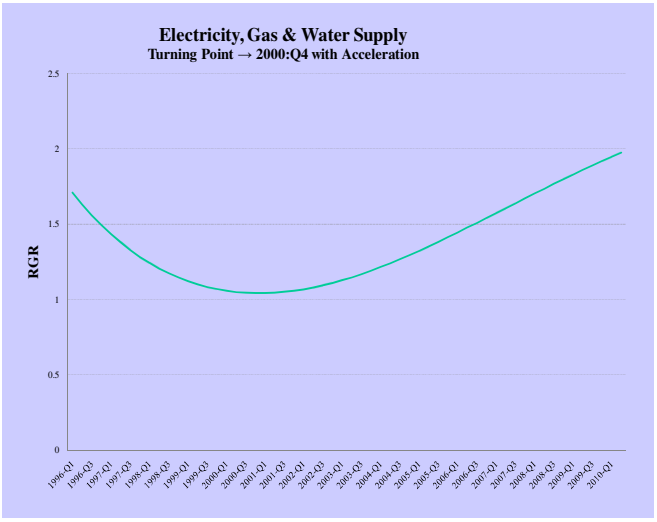
Table II: Extracted Values of Trend (on Log Scale)

Year	Quarter	AFF	MNQ	MFG	EGW	CON	THC	FRB	CSP	GDP
1996	Q1	11.6802	9.5068	11.2632	9.2548	10.2493	11.3764	11.0117	10.8907	13.0178
1996	Q3	11.6976	9.5467	11.2729	9.2958	10.2961	11.4121	11.0536	10.9483	13.0518
1997	Q1	11.6984	9.5954	11.2822	9.3347	10.3431	11.4488	11.1044	10.9891	13.0779
1997	Q3	11.6844	9.6329	11.2913	9.3742	10.3939	11.4855	11.1525	11.0583	13.1052
1998	Q1	11.7047	9.6516	11.3035	9.4079	10.4229	11.5244	11.1854	11.1479	13.1388
1998	Q3	11.7435	9.6568	11.3170	9.4335	10.4466	11.5614	11.2274	11.1664	13.1689
1999	Q1	11.7520	9.6780	11.3382	9.4727	10.4608	11.5987	11.2700	11.2320	13.1986
1999	Q3	11.7456	9.7020	11.3663	9.4991	10.4923	11.6407	11.3070	11.2798	13.2261
2000	Q1	11.7614	9.7177	11.4091	9.5085	10.5387	11.6795	11.3247	11.3093	13.2543
2000	Q3	11.7496	9.7202	11.4340	9.5180	10.5414	11.7093	11.3483	11.3342	13.2694
2001	Q1	11.7793	9.7215	11.4453	9.5233	10.5509	11.7528	11.3845	11.3531	13.2954
2001	Q3	11.8069	9.7519	11.4617	9.5394	10.5889	11.7984	11.4202	11.3758	13.3262
2002	Q1	11.7772	9.7983	11.4940	9.5629	10.6293	11.8441	11.4615	11.3923	13.3483
2002	Q3	11.7330	9.8261	11.5298	9.5848	10.6687	11.8875	11.4933	11.4185	13.3660
2003	Q1	11.7786	9.8305	11.5596	9.5974	10.7318	11.9385	11.5188	11.4651	13.4075
2003	Q3	11.8324	9.8676	11.5923	9.6301	10.7921	12.0053	11.5483	11.4754	13.4508
2004	Q1	11.8337	9.9271	11.6148	9.6465	10.8852	12.0618	11.5719	11.5055	13.4845
2004	Q3	11.8392	9.9672	11.6504	9.6569	10.9714	12.1246	11.6112	11.5496	13.5253
2005	Q1	11.8643	9.9676	11.6932	9.6859	11.0225	12.1814	11.6700	11.5886	13.5701
2005	Q3	11.8896	9.9798	11.7439	9.7192	11.0897	12.2364	11.7340	11.6224	13.6164
2006	Q1	11.9046	10.0213	11.8144	9.7702	11.1367	12.2933	11.8032	11.6402	13.6644
2006	Q3	11.9255	10.0589	11.8807	9.8175	11.1885	12.3480	11.8697	11.6458	13.7086
2007	Q1	11.9469	10.0758	11.9333	9.8614	11.2417	12.3973	11.9345	11.6781	13.7548
2007	Q3	11.9706	10.0994	11.9722	9.8918	11.2806	12.4480	11.9894	11.7145	13.7952
2008	Q1	11.9744	10.1070	11.9935	9.9116	11.3007	12.4903	12.0326	11.7818	13.8291
2008	Q3	11.9860	10.1208	11.9999	9.9338	11.3276	12.5141	12.0887	11.8494	13.8581
2009	Q1	11.9869	10.1651	12.0439	9.9677	11.3637	12.5567	12.1385	11.8840	13.8955
2009	Q3	11.9892	10.2212	12.1144	9.9958	11.4029	12.6091	12.1757	11.9043	13.9334
2010	Q1	12.0128	10.2524	12.1591	10.0229	11.4565	12.6688	12.2176	11.9460	13.9834

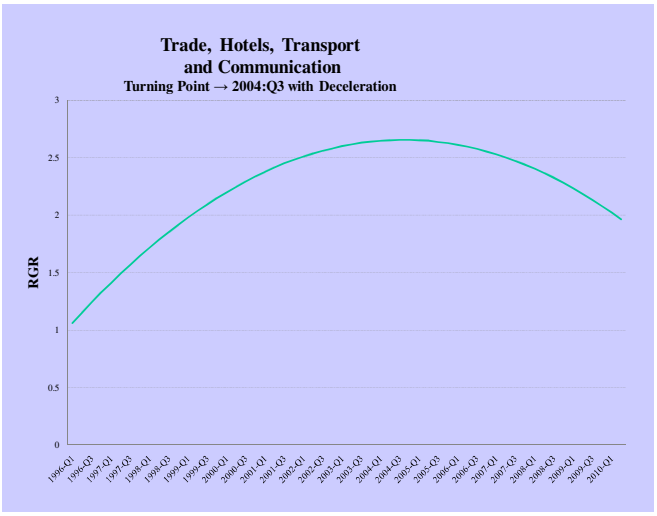
Figure 2. Temporal Paths of Relative Growth Rates in Different Components of India's QGDP.

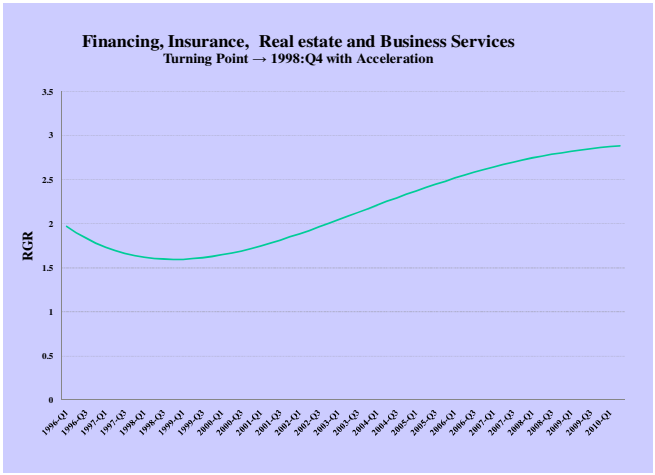


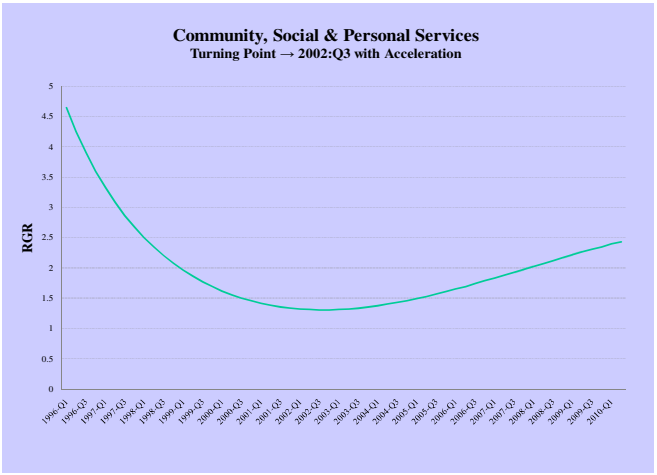


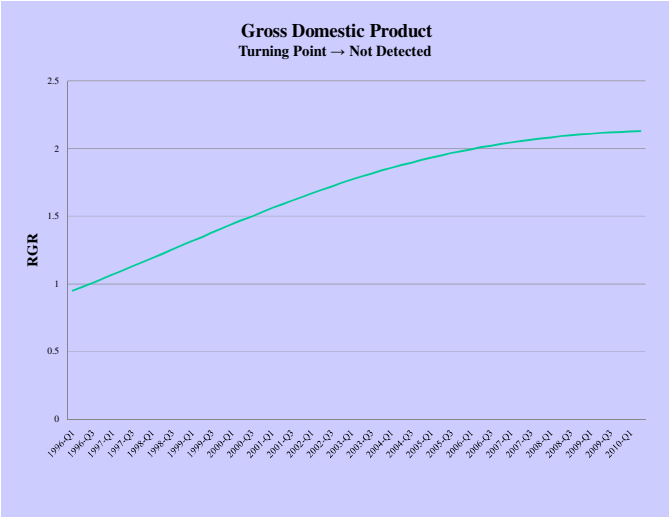



Construction
Turning Point → 2004:Q3 with Deceleration
RGR


Trade, Hotels, Transport and Communication
Turning Point → 2004:Q3 with Deceleration
RGR


Financing, Insurance, Real estate and Business Services
Turning Point → 1998:Q4 with Acceleration
RGR


Community, Social & Personal Services
Turning Point → 2002:Q3 with Acceleration
RGR


Gross Domestic Product
Turning Point → Not Detected
RGR

regulatory mechanism by the Indian Central Bank; (b) Relatively low degree of openness of the Indian economy; (c) Adequate governmental controls over Capital Account Convertibility; (d) Relatively high rate (≅ 34%) of Domestic Savings; and (e) Conservative habits of the people not to avail unnecessary loans. However, primary producing activities (like Agriculture, Mining & Quarrying, and Manufacturing) have been adversely affected over a span of time. Besides, there has been a deceleration in growth pattern of labour-absorbing activities, like Construction, and Trade, Hotels & Restaurants. The findings are in a fair agreement with those made through an earlier study by Sethi and Kaur (2011), based on annual estimates of India's income. Continually growing capital-intensive activities (like Electricity, Gas & Water Supply) and activities involving skilled work-force (like Banking/ Insurance), coupled with deceleration in labour-intensive activities (like Agriculture, Manufacturing, Construction, and Hotels & Restaurants) have induced *job-less growth.*

Concluding Remarks and Policy Implications

As per findings from the analysis, it may be concluded that although the Indian economy has continued experiencing overall GDP growth at a rate hovering around 7 percent; yet, at the disaggregated level, the economy has remained no exception so far as the impact of global financial crisis is concerned. The impact has been particularly glaring in respect of primary producing and labour-absorbing activities. Deceleration in the all-important Agriculture sector (known to have a share of as high as 54 percent in employment) would further aggravate the problem of declining productivity in the sector. There is thus an urgent need to adopt suitable policy measures so as to promote non-farm employment activities. As has been observed by Sethi (2012) in the context of small-scale agro-based industry in Punjab, elasticity of production with respect to employment is significantly higher than that with respect to fixed investment. Thus, strengthening of such an industry in India in general, and in food-surplus states like Punjab in particular, would expectedly help in releasing the excess labour force from low-productivity agricultural sector so as to get absorbed in high-productivity non-farm activities. Such a step would indeed be a leap in the right direction to ensure the growth process to be inclusive in nature.

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