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# Employment Intensity of Output: An Analysis of Non-Agriculture Sectors

## Transport, Storage and Communication Sector

**Institute of Applied Manpower Research**

**Planning Commission, Government of India**

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# Executive Summary

## Overview of the Sector

Transport, storage and communication sector is one of the leading service sectors in India. It has also undergone a substantial change in terms of public- private participation (PPP). As per the industry classification of National Accounts Statistics, transport, storage and communications are typically grouped in cohort. The combined contribution of these three sub-sectors account for 10 percent, 11.9 percent and 17.74 percent of gross domestic product, non-agricultural gross domestic product and services sector's gross domestic product (GDP), respectively in 2009-10 (CSO, 2011). In terms of employment, transport, storage & communication registers 4.36 percent, 9.27 percent and 17.10 percent of total employment, non-agricultural employment and services sector's employment, respectively in 2009-10 (NSSO, 2011). Among these three sub-sectors, transport is the largest contributor to GDP (64.1 percent) and employment (90.85 per cent). Communication has the second highest percentage (35.27) in GDP, while storage has a minimal share in GDP (0.63) (NSSO, 2011).

In India's transformation from an agrarian to a services economy, communication is recognized as the fastest growing sector, growing by 25.7 percent during 2001-08 (NCAER). The communication sector will be one of the major drivers of the Indian economy in the coming five years (NCAER). India's telecommunications are as prevalent or as advanced as those in modern Western countries, and the system includes some of the most sophisticated technology in the world and constitutes a foundation for further development of a modern network (TRAI, 2011). Participation of the private entities in the telecom sector is rapidly increasing and thereby creating enormous growth opportunities. India has the world's second largest mobile phone users with over 903 million as of January 2012 (TRAI, GOI, 2011). It has the world's third largest Internet users (with over 121 million) as of December 2011 (ITU, 2011). India has become one of the fasted growing and and competitive telecom markets (Dharmakumar, 2011; Kannan, 2010) in the world. With regard to transport, it is universally recognized that good physical connectivity in the urban and rural areas is essential for economic growth and modernization (World Bank, 2010). The provision of transport infrastructure and services helps in reducing poverty (Puri, 2003).

## Objectives of the Study

1. To understand the size and investment characteristics of the Transport and Communication sector in India
2. To analyse the dimensions of changing production techniques in the T & C Sector and explore the implications for employment generation in the country.
3. To suggest policy measures to create fresh employment opportunities in the sector.

The characteristic of this sector is that, having strong linkages with other sectors it generates greater indirect benefits than direct and, thereby, plays a crucial role in determining the country's progress and economic growth. Expansion of this sector will not only promote direct employment, output and revenue but also helps decrease transaction cost and enable a better access to information and increase productivity of businesses. Huge linkages of this sector include both macro and micro effects on the economy. At the macro level, this sector is linked with the level of output, employment and income within the economy, whereas at the micro level, it is linked with the producer, consumer and production costs.

The major hypotheses for this study are as follows:

1. An increase in investment (both domestic and foreign) and government initiatives (resulting in increased scale of operation) resulted in the increase in employment in certain sectors.
2. The change in production techniques/processes (be imported or indigenous – due to change in relative prices) in favour of capital intensive technology replaces labour.
3. Outsourcing and sub-contracting of work results in employment decline.

**Findings of the Study**

Other major issues and challenges emanated from the primary survey of the associations and enterprises are as follows:

*(i) Air Transport*

**a.** Govt. controlled airlines model followed in India is not profitable.
**b.** Increase of fuel price badly affects the sector's growth.
**c.** Air surcharge, Fuel surcharge, airport tax also affects the sector's growth.

*(ii) Non-schedule passenger land transport by motor vehicles*

**a.** Government policies on toll tax discourage the investors to invest in this sector.
**b.** There is a shortage of drivers and inadequate training centres for heavy vehicle drivers.
**c.** People are not interested to work in this sector due to un-attractive working condition, crime- prone highways and corruption and harassment by various authorities including police, RTOs etc. who harass vehicles off and on.

*(iii) Freight transport by motor vehicles*

**a.** Despite being a large employer sector it does not have the status of organized industry.
**b.** Large number of restrictive rules/laws (about 17 authorities) apply to the road transport which increases the time and cost.

**c.** Difference in road taxes from state to state increases the cost. Higher and multiple toll taxes on the transports also increase cost burdens.
**d.** Petrol prices also differ from state to state which increase cost burden for the transports.
**e.** Speed limit even on national highways is very low and it takes long hours and days to transport goods from one part of the country to another which increases cost burden.
**f.** Working hours for drivers/helpers are not specified because of the nature of work, which discourage young people to engage themselves in this sector.

*(iv) Non-schedule passenger land transport by other than motor vehicles (cycle rickshaws):*

1. Since this sector provides the minimum subsistence of living to the working poor, no charges should be imposed on those who are engaged in this sub-sector.

2. Number of rickshaw pullers has decreased in cities in recent years due to National Rural Employment Guarantee Scheme Act.

*(v) Courier Services*

1. Tax burden, mainly service tax, is found to be higher in this sub-sector.
2. Entry of the large number of private sector undertakings and increased investment has resulted in the growth of the sector.

**Policy Implications**

- To attract foreign tourists, the government should improve the security system to save them from internal threats of the country.
- Regulatory framework is required for measuring the standard level of hygiene.
- Reduction of fuel price, air surcharge, fuel surcharge, airport tax etc. may help to promote the aviation industry.
- Road transport sector should get the facilities and status of the organized industry.
- Restrictive rules/laws (of about 17 authorities) could be reduced to promote the freight transport sector.
- State tax should be proportionate to the number of times the vehicle enters into the respective state.
- Road tax differs from state to state that increases the cost. High and multiple toll taxes on the transports also increase cost burdens.
- Fuel prices should be same across states.
- Speed limit especially on national highways should be increased.
- Working conditions for the motor vehicle workers should be improved which will attract the young people to engage themselves in this sector.

- Since non-schedule passenger land transport by other than motor vehicles (cycle rickshaws) provides the minimum subsistence of living to the working poor, no charges should be imposed on those who are engaged in this section of the sector.
- Government should provide subsidy to buy CNG design for cycle rickshaws which is costly for purchasing.
- Tax burden, mainly service tax, is found to be higher in the courier services which needs to be relaxed so that more employment opportunities are generated in the sector.

# I. Introduction

## 1. Overview of the Sector

Transport, storage & communication sector is one of the leading sectors in services in India. It has also undergone a substantial change in terms of public vs. private participation (PPP). As per the industry classification of National Accounts Statistics; transport, storage & communications are typically grouped in cohort. The combined contribution of these three sub-sectors accounts for 10 percent, 11.9 percent and 17.74 percent of gross domestic product, non-agricultural gross domestic product and services sector's gross domestic product (GDP), respectively in 2009-10 (CSO, 2011). In terms of employment, transport, storage & communication registers 4.36 percent, 9.27 percent and 17.10 percent of the total employment, non-agricultural employment and services sector's employment, respectively in 2009-10 (NSSO, 2011). Among these three sub-sectors, transport is the largest contributor to GDP (64.1 percent) and employment (90.85 percent). Communication has the second highest percentage (35.27) in GDP, while storage has a very minimal share in GDP (0.63) (NSSO, 2011).

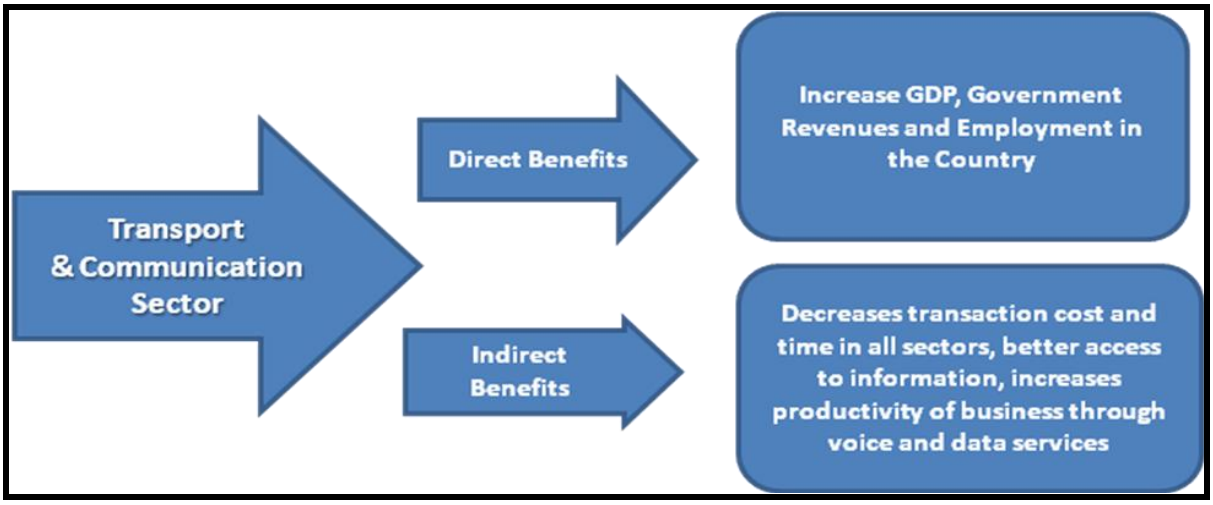
In India's transformation from an agrarian to a services economy, communication is recognized as the fastest growing sector, growing by 25.7 percent during 2001-08 (NCAER). The communication sector will be one of the major drivers of the Indian economy in the coming five years (NCAER). India's telecommunications are as prevalent or as advanced as those in modern Western countries, and the system includes some of the most sophisticated technology in the world and constitutes a foundation for further development of a modern network (TRAI, 2011). Participation of the private entities in the telecom sector is rapidly increasing and thereby creating enormous growth opportunities. There is a clear distinction between the Global Satellite Mobile (GSM) Communication used currently and Code Division Multiple Access (CDMA) technologies used earlier and the graph below shows the difference between the two. India has the world's second largest mobile phone users with over 903 million as of January 2012 (TRAI, GOI, 2011). It has the world's third largest Internet users with over 121 million as of December 2011 (ITU, 2011). India has become the world's most competitive and one of the fastest growing telecom market (Dharmakumar, 2011; Kannan, 2010).

In regard to transport, it is universally recognized that good physical connectivity in the urban and rural areas is essential for economic growth and modernization (World Bank, 2010). The provision of transport infrastructure and services helps in reducing poverty (Puri, 2003). Since the early 1990s, India's growing economy has witnessed a rise in demand for transport infrastructure and services. However, the sector has not been able to keep pace with this rising demand and is proving to be counterproductive on the economy. The performance of

the sector needs to be improved to support the country's continued economic growth and to reduce poverty (World Bank, 2010).

The specialty of this sector is that, having strong linkages with other sectors, it generates greater indirect benefits than direct and thereby plays a crucial role in determining the country's progress and economic growth. Expansion of this sector will not only promote direct employment, national output and government revenues; but also help to decrease transaction cost and time in all sectors, and enable a better access to information and increase productivity of business through voice and data services. Huge linkages of this sector include both macro and micro effects on the economy. At the macro level, this sector is linked with the level of output, employment and income within the economy, whereas at the micro level, it is linked with the producer, consumer and production costs.

**Figure 1: Benefits generated by Transport and Communication Sector**




## 2. Sectoral Composition of Transport

Major means of transportation are land, water and air. Land transport includes mainly road transport, pipeline transport and railway transport. Water transport includes both inland waterways and seaways and oceanic waterways. Air transport takes account of International airways and national airways.

### i) Land transport

Road transport sector has considerable significance even in rural areas getting socio-economic benefits, increased employment opportunities due to use of labour-intensive technique in road construction projects, access to education, health and nutritional facilities; strengthening of local market of towns as economic centres, movement of farm inputs, collection of the harvested crops, crop marketing etc.

**ii) Classification of roads**

In our country, we have a large network of roads that connect the towns, cities and remote areas. In india roads are of two types: kuccha roads and pucca roads. In villages, most of the roads are kuccha roads. However, some villages are connected with pucca roads. The pucca roads provide the means of fast and comfortable travel. The detail classification of the Indian roads is as follows:

1. Nation Highways: National highways constitute only 2 percent of the total road length but carry 40 per cent of the road traffic.

2. State Highways: These constitute 4 per cent of the total road length in the country.

3. District Roads: District roads are the connecting link between District Headquarters and the other important roads in the district. They account for 14 per cent of the total road length of the country.

4. Rural Roads: Rural roads provide links in the rural areas. About 80 per cent of the total road length in India is categorized as rural roads.

5. Other Roads: Border Roads – These roads are meant for increasing economic development of border areas and for strengthening defence.

6. International highways: International highways are meant to promote the harmonious relationship with the neighbouring countries by providing effective links with India.

**iii) Railways**

Indian Railways (IR) is one of the largest railways under single management and it is an Indian State-owned railway enterprise, owned and operated by the Government of India through the Ministry of Railways. Indian Railways has the world's fourth largest railway network after the United States, Russia and China (Central Intelligence Agency, 2009). The railways carry over 30 million passengers and 2.8 million tons of freight daily (Ministry of Railways, GOI, 2011). Indian Railways is the world's fourth largest commercial or utility employer, by number of employees, with over 1.4 million employees after Wal-Mart, with 2.1 million global employees; China National Petroleum Corporation, with 1.61 million employees; and State Grid Corporation of China with 1.53 million employees. As for rolling stock, IR owns over 229,381 Freight Wagons, 59,713 Passenger Coaches and 9,213 Locomotives. However, most of its major corridors have capacity constraint requiring capacity enhancement plans.

### iv) Water transport

India has 12 major and 187 minor and intermediate ports along its more than 7,500 km long coastline. These ports serve the country's growing foreign trade in petroleum products, iron ore, and coal, as well as the increasing movement of containers.

### v) Air transport

India has 125 airports, including 11 international airports. Indian airports handle 96 million passengers and 1.5 million tonnes of cargo in year 2006-2007.

## 3. Sectoral Composition of Communication

Communication network is broadly divided into personal communication system and mass communication system.

### i) Personal communication system

**Internet:** Internet enables the user to establish direct contact through e-mail. Moreover, it is increasingly used for e-commerce and carrying out money transactions. It provides efficient access to information at a comparatively low cost.

### ii) Mass communication system

**Radio:** Radio broadcasting started in India in 1923 by the Radio Club of Bombay. All India Radio broadcasts a variety of programmes related to information, education and entertainment.

**Television:** Television (TV) broadcasting has emerged as the most effective audiovisual medium for disseminating information and educating masses. First television services were introduced in New Delhi in 1959. In 1976, TV was delinked from All India Radio (AIR) and positioned a separate identity as Doordarshan (DD). After INSAT-IA (National Television-DD1) became operational, Common National Programmes were started for the whole country and its services were extended to the backward and remote rural areas.

**Satellite Communication:** Satellites are modes of communication among themselves as well as they regulate the use of other means of communication. Satellite provides a continuous and larger view of area which has made satellite communication very vital for the country. Satellite images can be used for weather forecast, monitoring of natural calamities, surveillance of border areas, etc.

### 4. Major Hypotheses

The major hypotheses for this study are as follows:

i) An increase in investment (both domestic and foreign) and government initiatives (resulting in increased scale of operation) resulted in the increase in employment in certain sectors.

ii) Change in production techniques/processes (be imported or indigenous – due to change in relative prices) in favour of capital intensive technology replaces labour.

iii) Outsourcing and sub-contracting of work results in employment decline.

## II. Growth and Dynamics of Transport and Communication Sector

### 1. Contribution in Employment and GDP by Sub-sectors

In order to measure the contribution of each sub-sector at the disaggregate level, we have measured the share of each subsector in transportation, storage and communication sector's GDP and employment.

**Table 1: Shares of sub-sectors in transportation, storage and communication sector's GDP (2004-05 base year prices)**

| | 1999-00 | | 2009-10 | | |
|---|---|---|---|---|---|
| Sub-sectors | GDP (Rs. Crore) | Percentage share | GDP (Rs. crore) | Percentage share | CAGR |
| Railways | 20234.88 | 15.84 | 45035 | 9.86 | 8.33 |
| Transport by other means | 78916.21 | 61.76 | 247660 | 54.23 | 12.12 |
| Storage | 1367.066 | 1.07 | 2904 | 0.63 | 7.83 |
| Communication | 27251.27 | 21.38 | 161055 | 35.27 | 19.44 |
| Total | 127769.4 | 100 | 456654 | 100 | 13.58 |

Source: CSO (2006 and 2011).

The above table reveals the positive growth rate (CAGR) for all the sub-sectors. Communication sector accounts for the highest growth rate and this is the only sector whose percentage share has increased between 1999-2000 and 2009-10. Excepting communication, all sectors' percentage share has decreased from 1999-2000 to 2009-10. For instance, Railways sector's share has decreased from 15.84 percent in 1999-00 to 9.86 percent in 2009-10. Transport by other means (Road and pipeline water and air) has decreased from 61.76 in 1999-00 to 54.23 in 2009-10. Storage's share has decreased from 1.07 in 1999-2000 to

0.63 in 2009-10. All these decreases resulted due to the rapid increase in communication sector.

**Table 2: Employment by Sub-Sectors in Transportation, Storage and Communication Sector**

| Subsectors | 1999-00 | | 2009-10 | | |
|---|---|---|---|---|---|
| | Number (in millions) | Share | Number (in millions) | Share | CAGR |
| Land transport; transport via pipelines | 12.49 | 85.45 | 17.01 | 85.20 | 3.14 |
| Water transport | 0.2 | 1.37 | 0.12 | 0.59 | -4.98 |
| Air transport | 0.08 | 0.55 | 0.09 | 0.43 | 1.18 |
| Supporting and auxiliary transport activities; activities of travel agencies | 0.55 | 3.76 | 0.95 | 4.76 | 5.62 |
| Post and telecommunications | 1.29 | 8.83 | 1.80 | 9.01 | 3.39 |
| Total | 14.61 | 100 | 19.97 | 100 | 3.17 |

Source: NSSO (1999-00 and 2009-10)

Table 2 shows that there is a huge employment increase in land transport in absolute terms between 1999-2000 and 2009-10 in all the sub sectors, excepting water transport. The absolute number employment increase is much higher in land transport (4.52 millions) in comparison with others. In terms of percentage share, land transport generates the major share (85.20 percent in 2009-10) of employment in transport, storage and communication sector. This sector shows a positive growth rate (3.14) between 1999-2000 and 2009-10. However, land transport's share has slightly decreased from 85.45 percent in 1999-2000 to 85.20 percent in 2009-10. The second highest share (9.01 percent in 2009-10) of employment is generated by post and telecommunications sector. This sector shows an increase in its share from 8.83 percent in 1999-2000 to 9.01 percent in 2009-10. Supporting and auxiliary transport activities, activities of travel agencies and post and telecommunications account for marginal increase in their share, while both water transport and air transport recorded marginal decrease in their share of sector's employment generation. Even, water transport accounts for negative growth (-4.98) rate between 1999-2000 and 2009-10. Compound annual growth rate of supporting and auxiliary transport activities, activities of travel agencies (5.62) is highest in comparison with the other sub-sectors. Post and telecommunications also shows a positive growth rate.

## 2. Employment in Sub-sectors by Unorganized and Organized Sectors

In regard to the entire Indian economy, unorganized sector provides employment to more than 86 percent of the total employed. This makes it relevant to measure the employment in sub-sectors of transport and communication by unorganized and organized sectors.

**Table 3: Employment in sub-sectors by unorganized and organized sectors (in millions)**

| | 1999-00 | | | 2009-10 | | |
|---|---|---|---|---|---|---|
| Sub sectors | Unorganized | Organized | Total | Unorganized | Organized | Total |
| Land transport; transport via pipelines | 9.64 (77.18) | 2.85 (22.82) | 12.49 (100) | 13.91 (81.75) | 3.10 (18.25) | 17.01 (100) |
| Water transport | 0.07 (35) | 0.13 (65) | 0.2 (100) | 0.03 (26.14) | 0.09 (73.86) | 0.12 (100) |
| Air transport | 0 (0) | 0.08 (100) | 0.08 (100) | 0.01 (12.38) | 0.08 (87.62) | 0.09 (100) |
| Supporting and auxiliary transport activities; activities of travel agencies | 0.27 (49.09) | 0.28 (50.91) | 0.55 (100) | 0.46 (48.28) | 0.49 (51.72) | 0.95 (100) |
| Post and telecommunications | 0.46 (35.66) | 0.83 (64.34) | 1.29 (100) | 0.67 (37.48) | 1.12 (62.52) | 1.80 (100) |
| Total | 10.44 (71.46) | 4.17 (28.54) | 14.61 (100) | 15.08 (75.54) | 4.88 (24.46) | 19.97 (100) |

Source: NSSO (1999-00 and 2009-10)

Table 3 illustrates that land transport has a major share in employment generation (81.75 percent) in its unorganized part, while rest of the sub-sectors have a major share of employment generation in their organized counterparts. Employment in the unorganized part in land transport, air transport, post and telecommunication have increased from 77.18 percent, 0 percent and 35.66 percent in 1999-2000 to 81.75 percent, 12.38 percent and 37.48 percent in 2009-10, respectively. In aggregate, 75.54 percent employment has been generated from the unorganized part of the transport, storage and communications sector.

### 3. Share of the States in employment by Sub-sectors

In a diversified country like India heterogeneity in all socio economic indicators and even the performance of different economic entities across states are always observed (Table 4).

**Table 4: Share of the States in Employment in Transport, Storage and Communications by Sub-Sectors**

| | Land transport; transport via pipelines | Water transport | Air transport | Supporting and auxiliary transport activities; activities of travel agencies | Post and telecommunications | Total |
|---|---|---|---|---|---|---|
| Jammu & Kashmir | 0.94 | 0.00 | 0.00 | 0.15 | 0.89 | 0.89 |
| Himanchal Pradesh | 0.54 | 0.00 | 0.00 | 0.74 | 0.56 | 0.54 |
| Panjab | 2.43 | 0.00 | 0.00 | 2.28 | 2.50 | 2.41 |
| Chandigarh | 0.14 | 0.00 | 0.00 | 0.02 | 0.61 | 0.17 |
| Uttarakhand | 0.45 | 0.42 | 0.00 | 0.20 | 0.18 | 0.41 |
| Hariyana | 2.25 | 0.00 | 0.00 | 1.91 | 2.96 | 2.28 |
| Delhi | 2.06 | 0.00 | 20.77 | 5.55 | 6.95 | 2.74 |
| Rajasthan | 5.05 | 0.00 | 0.00 | 1.33 | 4.58 | 4.77 |
| Uttar Pradesh | 11.66 | 5.20 | 1.22 | 4.89 | 3.12 | 10.47 |
| Bihar | 6.34 | 0.00 | 0.00 | 2.06 | 1.96 | 5.67 |
| Sikkim | 0.07 | 0.00 | 0.00 | 0.17 | 0.07 | 0.07 |
| Arunachal | 0.05 | 0.00 | 0.00 | 0.00 | 0.03 | 0.05 |
| Nagaland | 0.14 | 0.00 | 0.00 | 0.03 | 0.24 | 0.14 |
| Manipur | 0.11 | 0.00 | 0.00 | 0.00 | 0.01 | 0.10 |
| Mizoram | 0.05 | 0.04 | 0.00 | 0.00 | 0.01 | 0.04 |
| Tripura | 0.38 | 0.00 | 0.00 | 0.01 | 0.09 | 0.33 |
| Meghalaya | 0.22 | 0.00 | 0.00 | 0.00 | 0.19 | 0.21 |
| Assam | 1.98 | 0.00 | 0.00 | 0.52 | 2.06 | 1.90 |
| West Bengal | 9.84 | 4.45 | 11.31 | 14.82 | 5.19 | 9.63 |
| Jharkhand | 2.33 | 0.00 | 0.00 | 0.68 | 0.54 | 2.06 |
| Orissa | 3.27 | 0.04 | 0.00 | 1.05 | 1.55 | 2.98 |
| Chhattisgarh | 0.90 | 0.00 | 0.00 | 1.35 | 0.79 | 0.90 |
| Madhya Pradesh | 2.76 | 0.00 | 4.20 | 2.91 | 1.52 | 2.64 |
| Gujarat | 6.61 | 8.98 | 0.00 | 5.64 | 7.31 | 6.61 |
| Daman & Div | 0.03 | 0.44 | 0.00 | 0.00 | 0.00 | 0.03 |
| Dadar N. Haveli | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| Maharastra | 10.99 | 8.61 | 40.32 | 24.53 | 19.28 | 12.51 |
| Andra Pradesh | 8.97 | 34.88 | 9.00 | 8.91 | 11.25 | 9.32 |

| | | | | | | |
|---|---|---|---|---|---|---|
| Karnataka | 5.71 | 0.00 | 2.61 | 4.40 | 9.05 | 5.90 |
| Goa | 0.15 | 1.90 | 0.20 | 0.68 | 0.17 | 0.18 |
| Lakshadeep | 0.00 | 1.47 | 0.00 | 0.07 | 0.02 | 0.01 |
| Kerala | 4.90 | 12.46 | 6.72 | 5.19 | 5.66 | 5.03 |
| Tamil Nadu | 8.46 | 18.46 | 3.64 | 9.21 | 10.26 | 8.70 |
| Pandicheri | 0.16 | 0.00 | 0.00 | 0.24 | 0.34 | 0.18 |
| A&N Islands | 0.05 | 2.64 | 0.00 | 0.46 | 0.08 | 0.08 |
| Total | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |

Source: NSSO (2009-10)

From the above table it is seen that UP has the highest share in land transport followed by Maharashtra. West Bengal has second and third highest share. In water transport, Andhra Pradesh alone occupies about 35 percent share. In air transport, Maharashtra has the highest share (40.32 percent) and Delhi has the second highest share (20.77 percent). West Bengal accounts for 11.31 percent share in air transport and has the third highest share.

In communication, Maharashtra, Andhra Pradesh and Tamil Nadu stand with the first, second and third position respectively in terms of their percentage share in employment in post and telecommunication sector. It is important to note that, in general, southern states (Andhra Pradesh, Karnataka, Tamil Nadu and Kerala) are relatively in higher ranks in transport and communication than other regions.

### 4. Size of Employment by Sub-sectors as per NIC-5 Digit Classification

Even within the aforementioned sub-sectors, performance varies across sub-sectors after further disaggregate classification. Employment size and percentage share of different sub-sectors at NIC-5 digit levels are presented in tables 5 to 10.

**Table 5: Size of Employment in Road Transport by Sub-sectors**

| NIC-5 digit | Sub-sectors | Number of employment | Percentage Share in the transport, storage and communication sector |
|---|---|---|---|
| 60221 | Other non-scheduled passenger land transport by motor vehicles | 5901717 | 29.56 |
| 60222 | Other non-scheduled passenger land transport, other than by motor vehicles (i.e. by bullock carts, tongas and cycle rickshaws etc.) | 2256751 | 11.3 |
| 60231 | Freight transport by motor vehicles | 5252871 | 26.31 |
| 60232 | Freight transport other than by motor vehicles | 1570027 | 7.86 |
| 60300 | Transport via pipelines | 27370 | 0.14 |

Source: NSSO (2009-10)

The above table depicts that other non-scheduled passenger land transport by motor vehicles alone accounts for 29.56 percent of employment in total sector's employment. The second highest percentage (26.31 percent) is provided by Freight transport by motor vehicles. Moreover, other non-scheduled passenger land transport, other than by motor vehicles (i.e. by bullock carts, tongas and cycle rickshaws etc.) generates 11.3 percent employment.

**Table 6: Size of Employment in Railways by Sub-Sectors**

| NIC-5 digit | Sub-sectors of railways | Number of employment | Percentage Share in the transport, storage and communication sector |
|---|---|---|---|
| 60101 | Passenger railway transport | 601586.9 | 3.01 |
| 60102 | Freight railway transport | 96820.52 | 0.48 |
| 60109 | Railway transport n.e.c. | 370159.5 | 1.85 |
| 60211 | Land transport other than urban, sub-urban including underground and elevated railways | 605822.7 | 3.03 |
| 60212 | Transport of urban sub-urban including underground and elevated railways. | 329258.2 | 1.65 |

Source: NSSO (2009-10).

Table 6 represents the fact that Land transport other than urban, sub-urban including underground and elevated railways provides 3.03 percent employment in total sector's employment. Passenger railway transport, railway transport n.e.c. and freight railway transport account for 3.01 percent, 1.85 percent and 0.48 percent employment respectively.

**Table 7: Size of Employment in Water Transport by Sub-sectors**

| NIC-5 digit | Sub-sectors | Number of employment | Percentage Share in the transport, storage and communication sector |
|---|---|---|---|
| 61100 | Sea and coastal water transport | 94680.67 | 0.47 |
| 61200 | Inland water transport | 22675.92 | 0.11 |
| 62100 | Scheduled air transport | 86742.11 | 0.43 |
| 63011 | Cargo handling, incidental to land transport | 236368.6 | 1.18 |
| 63012 | Cargo handling, incidental to water transport | 49682.6 | 0.25 |

Source: NSSO (2009-10).

Table 7 shows that contribution to all the sub-sectors in water transport is very minimal in total sector's employment. Specifically, Cargo handling, incidental to land transport provides

1.18 percent of employment and rests of the sub-sectors contribution even much lesser than one percent.

**Table 8: Size of Employment in Air Transport by Sub-sectors**

| NIC-5 digit | Sub-sectors | Number of employment | Percentage share in the transport, storage and communication sector |
|---|---|---|---|
| 62100 | Scheduled air transport | 86742 | 0.43 |
| 63013 | Cargo handling, incidental to air transport | 8914 | 0.04 |
| 63033 | Supporting services to air transport | 10373 | 0.05 |

Source: NSSO (2009-10)

In air transport, scheduled air transport's share (0.43) is much higher in comparison with other sub-sectors.

**Table 9: Size of Employment in Communication by Sub-sectors**

| NIC-5 digit | Sub-sectors | Number of employment | Percentage Share in the transport, storage and communication sector |
|---|---|---|---|
| 64110 | National post activities | 303186.3 | 1.52 |
| 64120 | Courier activities other than national post activities | 239456.2 | 1.2 |
| 64201 | Telecom services and maintenance of telecom work | 1002231 | 5.01 |
| 64204 | Activities of the cable operators | 254410.2 | 1.27 |

Source: NSSO (2009-10)

In communication, telecom services including provision of basic telecom services (telephone, telex and telegraph) and provision of value added telecom services (paging, e-mail, cellular phone, video conferencing, internet etc.) generate 5.01 percent of employment. While, national post activities, courier activities and activities of the cable operators lead 1.52 percent, 1.20 percent and 1.27 percent of the sector's employment respectively.

## 5. Selected sub-sectors

In can be construed from the above discussion that, non-scheduled passenger land transport by motor vehicles provides highest number (29.56 percent) of employment. Moreover, freight transport by motor vehicles accounts for the second highest share (26.31 percent) in the

sector's employment. Non-scheduled passenger land transport other than by motor vehicles and freight transport other than by motor vehicles account for 11.30 percent and 7.86 percent respectively. Passenger railway transport sector provides 3.01 percent of the sector's employment.

In storage, all sub sectors' contributions are very negligible i.e., less than one percent of the sector's employment. In communication sector, telecom services accounts for the higher share (5.01 percent) of employment. Further, national post activities and courier activities contribute 1.52 percent and 1.20 percent of the sector's employment. Based on the above discussion the selected sub-sectors for in-depth analysis are as follows:

**Transport**

Non-scheduled passenger land transport by motor vehicles (29.56%)

Freight transport by motor vehicles (26.31%)

Non-scheduled passenger land transport other than by motor vehicles (11.30%)

Air transport (0.43%)

Railways (5.34%)

**Communication**

Telecom services and maintenance of telecom network (5.01%)

Post Office (1.52%)

Courier activities (1.20%)

**Total = 80.67%**

## III. Policies and Performance

### 1. Transport policies

Since there is a significant change in transport policies after 1992 due to the introduction of economic liberalization, the policies are presented separately by pre- and post-1992 periods.

## Table 10: Transport policies in India

| Pre - 1992 transport policy status | |
|---|---|
| **Transport policy** | **Sub-sector** |
| Reducing the energy intensity of the transport sector | Railways<br>• Initiatives identified in numerous policy documents to increase the share of railways. NTPC (1980) suggested a modal share of road to be 28% for freight and 60% for railway passenger<br>• Reduced energy intensity of transport systems by increasing the share of electric traction in railways and public transport in urban areas<br><br>Urban transport<br>• Increased share of public transport in urban areas along with efficient vehicle technology to reduce the energy and environmental implications<br>• An efficient mass transport system to reduce the energy intensity of the sector<br>• Given the rapid increase in city size, the need for rail-based urban transport systems should be explored.<br>• Pricing of mass transport services should be based on commercial principles so as to ensure viability of public transport ventures.<br>• Private sector involvement in the operation and management of urban transport systems would have the twin benefits of efficiency gains and thus cost reductions, and additional resource mobilization.<br><br>Land use transport implications<br>• Optimization of transport effort by policy measures such as dispersal of industries and rational land-use planning<br>• Land-use and transport planning in the urban context should be parallel processes. Developing of multi-nucleated metropolitan centres |
| Increasing the productivity of transport sector | • Transport user costs to include external costs<br>• Least-cost principle to be followed in deciding modal shares policy to be implemented by integrated transport infrastructure planning<br>• Predominant role for government in providing transport infrastructure<br>• Pricing of transport services to be on marginal cost basis |
| **Transport policy post -1992** | |
| Economic liberalization | • Introduction of a number of small and fuel-efficient cars |
| Improvement in vehicle emission norms | • Certificate of fitness for in-use vehicles introduced. It is now mandatory for every motor vehicle to obtain a certificate of pollution under control (PUC) every three months.<br>• Vehicular emissions standards progressively tightened |

| | |
|---|---|
| | • A CNG pilot programme launched in 1993 in Delhi, Mumbai , Surat and Vadodara aimed at conversion of petrol vehicles into vehicles using CNG as a fuel<br>• LPG is now permitted as a transport fuel<br>• Use of battery operated vehicles/electric vehicles for IPT and buses on a trial basis |
| | • Pre-mixed fuel (petrol and lubricating oil) for use in two-stroke engines of two- and three-wheelers has been introduced at filling stations in Delhi to optimize the oil-fuel mix. |
| Improvements in fuel quality | • Unleaded petrol introduced into the entire country<br>• Diesel sulphur content was reduced from 1% to 0.05% in the four metros and to 0.25% in the rest of the country |
| Judicial interventions in Delhi | • 1995 Initiatives to convert all Government of India vehicles into CNG<br>• Restrict plying of commercial vehicles older than 15 years from 15 October, 1998<br>• No eight-year old bus to ply except on clean fuels by 31 March, 2000<br>• Replacement of all pre-1990 taxis with new vehicles on CNG or other clean fuels (like CNG) by 31 March, 2000<br>• Gradual transformation of the entire city's bus fleet into a single mode on CNG by 30 September, 2001<br>• Financial incentives for the replacement of all post-1990 autos and taxis with new vehicles on clean fuels by 31 March, 2001<br>• Augment public transport by increasing the number of public buses to 10,000 by the 1 April, 2001 |
| Port sector restructuring | • Areas for private sector investment identified<br>• Procedure for inviting private participation laid down<br>• Setting up of Tariff Authority for Major Ports (TAMP)<br>• Policy guidelines to enable major ports to set up joint ventures |
| Road sector liberalization | • The National Highways Act was amended in 1995 to allow private sector participation.<br>• The NHAI (National Highways Authority of India) has been mandated to implement the National Highways Development Project comprising strengthening and upgrading of about 13, 000 km of high-density corridors to a four-lane status.<br>• Norms for foreign investment in the road sector has been liberalized and approval for foreign equity participation under certain conditions ensured.<br>• Funds have been made available to the NHAI for its capital base through a tax on motor spirit and a cess on diesel. |
| Liberalization of the civil aviation sector | • Corporatization of Delhi, Mumbai and Bangalore airports proposed<br>• Automatic approval for foreign equity participation in airports<br>• Private air-taxi operations permitted |

| | |
|---|---|
| | • 100% NRI investment permitted in air-taxi operation |
| Regional cooperation | • Proposals for linking Indian railways with Bangladesh railways<br>• Proposals for upgradation as the Bangladesh railways may require in order to carry the additional Indian traffic<br>• Offer to assist Myanmar to extend its railway to the main Yangon-Mandalay rail system and form part of the Trans-Asian Railway in the future.<br>• A need for a revised regional perspective plan for road development in the North East with international linkages, especially Bangladesh has been recognized. |

Source: Ministry of Environment and Forest, GOI (2002)

## 2. Evolution of Air Transport Industry

As the India's first civil aviation industry started operating in a small aircraft from Karachi to Mumbai in 1932. Then, in 1953, the government nationalized the country's airline industry, establishing Air India International and Indian Airlines. In 1994, the government ended the monopoly on schedule domestic airline routes. Seven new airlines received licenses to fly. Further, in 2003, two new operating licenses were granted to Air Decan. They first introduced low-cost carrier (LCC) which had massive impact in airlines market. India has 125 airports, including 11 international airports. Indian airports handled 96 million passengers and 1.5 million tonnes of cargo in year 2006-2007.

## 3. Evolution of Telecom Industry

Evolution of the Indian telecom sector can be divided into three phases. Phase-I incorporates the changes of telecom sector from 1980 to 1989, whereas phase-II and phase-III include the changes between 1990 to 1999 and 2000 onwards respectively. The major policies in the first phase are entry of private sector in telecommunications equipment manufacturing in 1984, formation of Mahanagar Telephone Nigam Limited (MTNL) and Videsh Sancher Nigam Limited (VSNL) in 1986 and setting up of Telecom Commission in 1989. Liberalization in the Indian economy is initiated in the second phase and the subsequent major policy changes include private sector participation in cellular and paging services in 1992; National Telecom Policy in 1994; establishment of Telecom Regulatory Authority of India (TRAI) in 1997, and New Telecom Policy (NTP) in 1999. The massive policy changes in this sector have taken place in the third phase which incorporates establishment of Bharat Sanchar Nigam Limited was established in 2000; initiation of National Long Distance (NLD) and International Long Distance (ILD) services competition in 2000, launching Code Division Multtiple Access (CDMA) technology in 2000, initiation of Internet telephony in 2000, reduction of License fees in 2000, privatization of VSNL in 2002, starting of mobile service by BSNL in 2002, introduction of Unified Access Licensing in 2003, formulation of Broadband policy formulated in 2004 and establishment of intra- circle merger guidelines in 2004.

In addition, there are significant tariff changes that have taken place in the third phase. For instance, the peak NLD tariff for above 1,000 km in 2000 has come down from US$ 0.67 per minute to US$ 0.02 per minute in 2009; the ILD tariff has come down from US$ 1.36 per minute in 2000 to US$ 0.16 per minute in 2009 for USA, Canada and UK. Moreover, the mobile tariff for local calls has reduced from US$0.36 per minute in 1999 to US$ 0.009 - US$ 0.04 per minute in 2009.

Key features of the National Telecom Policy, 1999 include:

(i) Strengthening of Regulator
(ii) The NLD services were opened to private operators.
(iii) The ILD Services were opened to private sectors.
(iv) Private telecom operators were licensed on a revenue sharing basis, plus a one-time entry fee. Resolution of problems of existing operators envisaged.
(v) Direct inter-connectivity and sharing of network with other telecom operators within the service area was permitted.
(vi) Department of Telecommunication Services (DTS) was corporatized in 2000.
(vii) Spectrum Management was made transparent and more efficient.

Key features of the Broadband Policy-2000 are as follows:

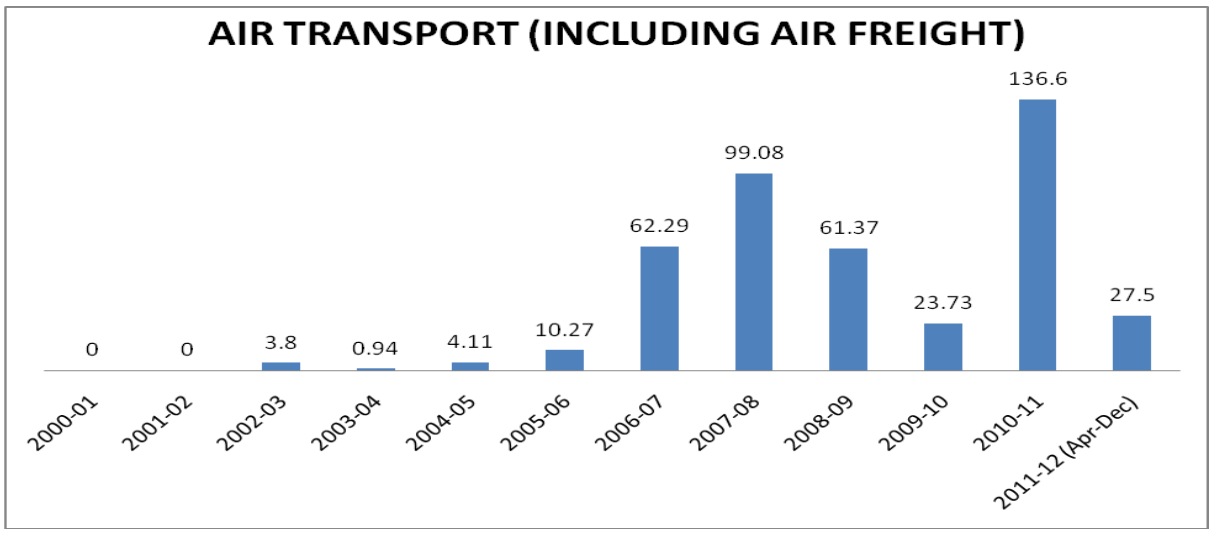
(i) The main emphasis was on the creation of infrastructure through various technologies that can contribute to the growth of broadband services. These technologies include optical fibre, Asymmetric Digital Subscriber Lines (ADSL), cable TV network; DTH etc.
(ii) Broadband connectivity has been defined with the minimum speed of 256 kbps.
(iii) Both outdoor and indoor usage of low power Wi-Fi and Wi-Max systems in 2.4 GHz-2.4835 GHz band have been delicensed.
(iv) The use of low power indoor systems in 5.15-5.35 GHz and 5.725-5.875 GHz bands has also been delicensed.
(v) The Standing Advisory Committee on Radio Frequency Allocation (SACFA)/ Wireless Planning & Coordination (WPC) clearance has been simplified.
(vi) The setting up of National Internet Exchange of India (NIXI) would enable bringing down the international bandwidth cost substantially, thus making the broadband connectivity more affordable.

## IV. Investment and Employment

### 1. Impact of Investment in Transport and Communication Sector

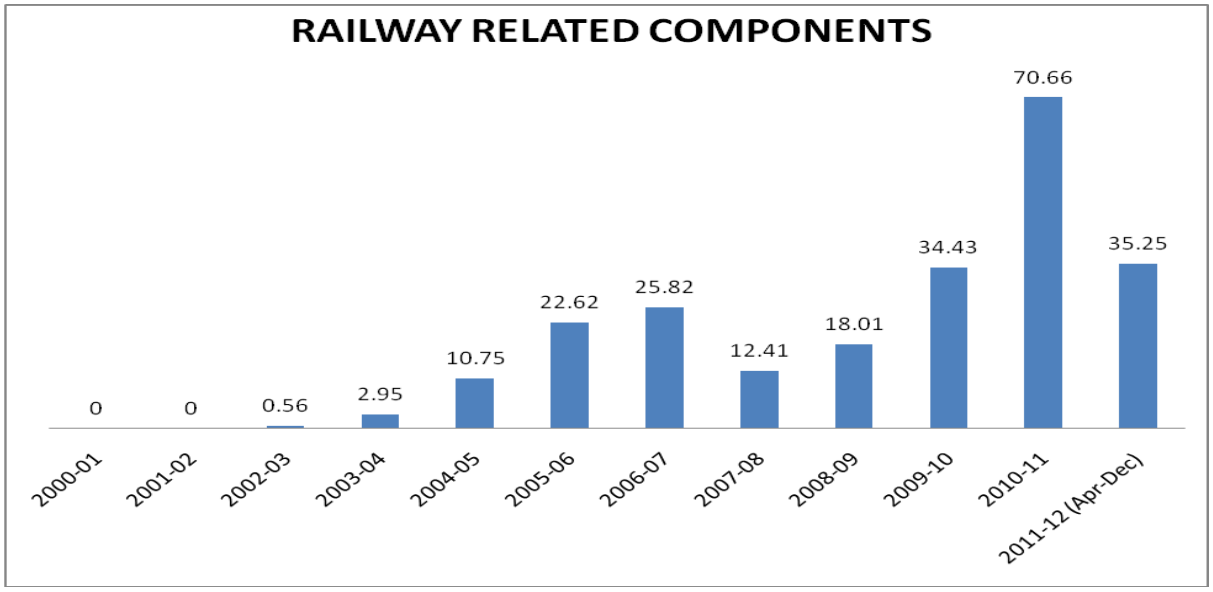
Foreign entrepreneurs are allowed to invest up to 49 per cent in domestic air transport. Equity from foreign airlines is however not allowed whether directly or indirectly.

**Figure-1: FDI inflow overtime in Air transport (Including Air Freight) (US $ million)**




Source: Author's computation using DIPP (2012)

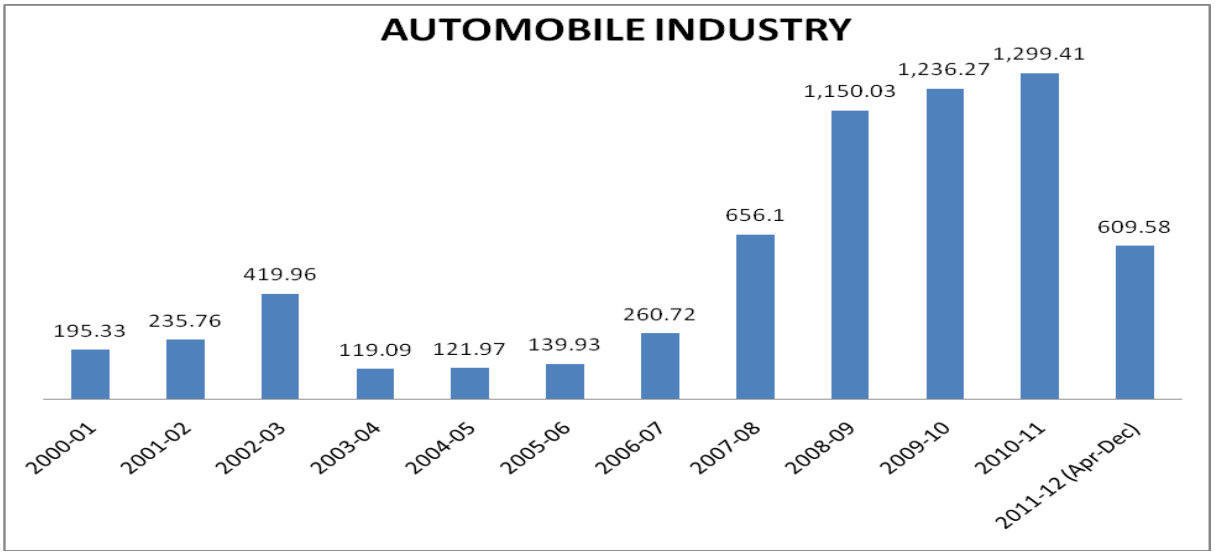
**Figure 2: FDI inflow overtime in railways related components (US $ million)**




Source: Author's computation using Development of Industrial Policy and Promotion DIPP (2012)

FDI inflow has increased significantly, both in air transport and railways sectors, just after 2004-05 i.e., soon after the revision of FDI policies. The increased in FDI inlow in transport sector increased, demand for automobile products also which in turn may have impact on the FDI of automobile sector as well. Figure 3 presents the FDI inflow in automobile sector.

**Figure 3: FDI inflow overtime in automobile industry (US $ million)**



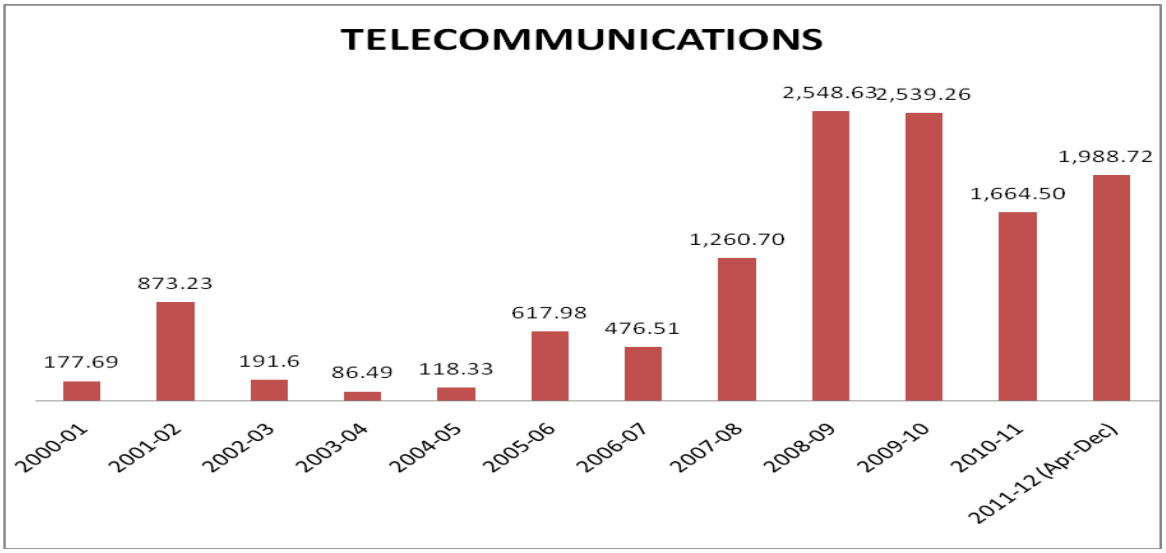

Source: Author's computation using Department of Industrial Policy and Promotion (DIPP) (2012)

The FDI inflow in automobile sector has decreased significantly in 2004-05, While, it has increased from 2007-08 onwards.

## 2. Impact of Investment in Communication Sector

In the basic Cellular Mobile, Paging and Value Added Service, and Global Mobile Personal Communications by Satellite composite FDI permitted is 74 per cent. According to the new norms, 26% share should be held by an Indian company or an Indian citizen with Indian management. Moreover, FDI upto 74 per cent (49% under automatic route) is also permitted for the Radio Paging Service and Internet Service Providers (ISP's), while FDI upto 100 per cent is permitted in respect of the Infrastructure Providers providing dark fibre (IP Category I), Electronic Mail and Voice Mail. In telecom manufacturing sector 100 per cent FDI is permitted under automatic route.

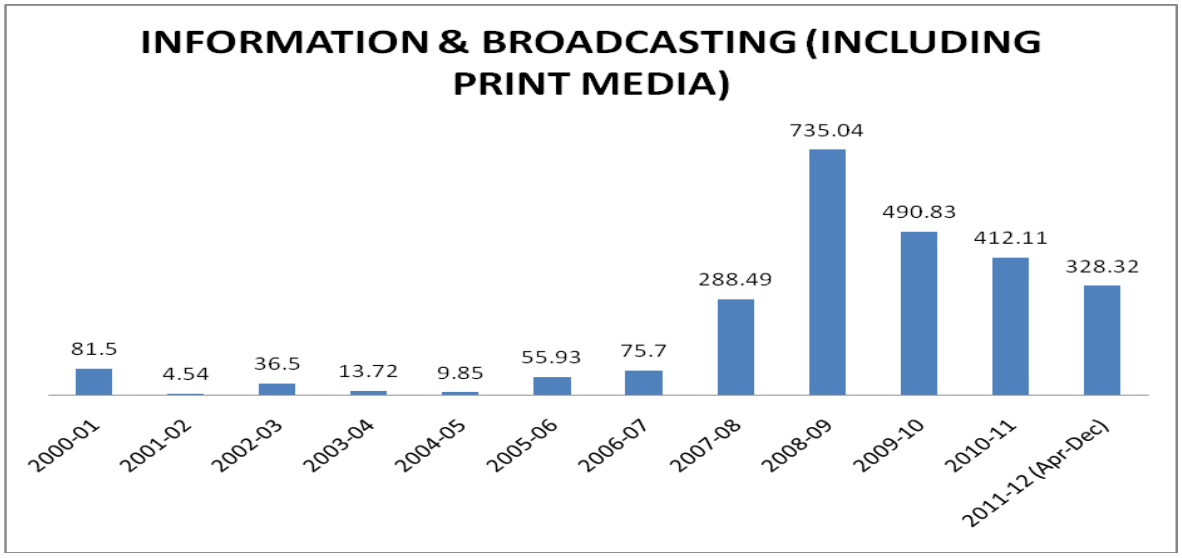
**Figure 4: FDI inflow in Telecommunication (radio paging, cellular mobile, basic telecom services) (US $ million)**




Source: Author's computation using DIPP (2012)

The Indian telecom industry has been an attractive avenue for foreign investors over the years. Since 2004, there has been a large inflow of FDI in the sector. During 2004-05 and 2005-06, a period during which the FDI norms were relaxed, the FDI inflow grew by an astounding 300 per cent to US$ 618 million in 2005-06 from merely US$ 118 million in 2004-05. The inflow of FDI has provided tremendous impetus to the sector in the past few years and the attractiveness of the sector has kept the FDI inflows growing steadily. During 2008-09 the FDI in the telecom sector at US$ 2,549 million was 103 per cent which was higher than that seen in 2007-08 at US$ 1,261 million. The government's liberalised FDI policies have resulted in several foreign companies entering into the Indian markets. The influx of foreign players in the Indian telecom industry has led to capacity creation and better infrastructure, which in turn has improved the network quality. The rise in FDI has also enabled technology transfer, market access and improved organisational skills; going forward, FDI could be used for providing telecom services to rural areas, where tele-density is still very low. The change in FDI policy that has raised the FDI limit from 49 per cent to 74 per cent for the sector has made it more attractive for foreign players. In the long run the growth prospects of telecom players that have foreign partners will improve and other players will get new avenues to raise capital.

**Figure 5: FDI inflow overtime in Information & Broadcasting (including print media) (US$ million)**



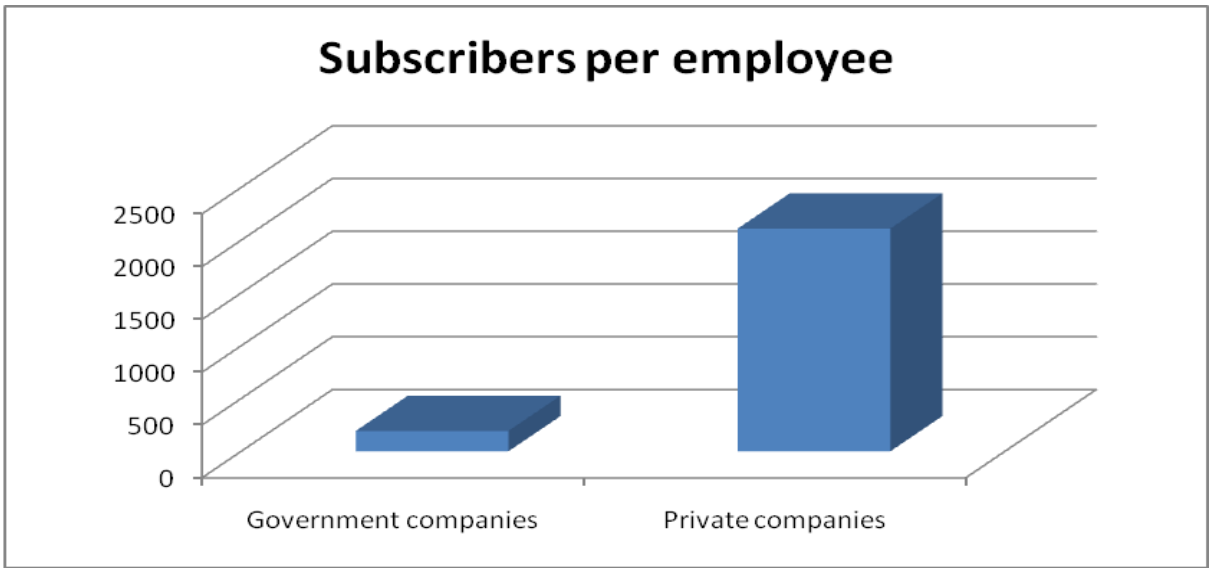

Source: Author's computation using DIPP (2012)

**Table 11: Employment Intensity of Telecom Sector by Government and Private Companies**

| | Government companies | Private companies |
|---|---|---|
| Subscribers (million) | 71.39 | 134.47 |
| Employees | 369035 | 63736 |
| Subscribers per employee | 193 | 2110 |

Source: TRAI

**Figure 6: Subscribers per Employee in Telecom Sector by Government and Private Companies**




Source: Author's computation using TRAI.

Private telecom sector's employees are about eleven times more productive than government sector. The possible reasons are government sector is less productive due to moral hazard problem and has poor management efficacy.

## V. Technological advancement and Employment

### 1. Impact of Technological Advancement in Transport Sector and Employment

Business operation in transport sector became easier and time saving due to the enhancement of IT sector. A major technological change has taken place in terms of the introduction of Air Conditioned cabin with good grip and low-floor buses. Even in the non-schedule passenger land transport by other than motor vehicles (cycle rickshaws) cost-effective and modern CNG design is introduced. However, from the primary survey it has been observed that there is a massive shortage of skilled worker like driver which is a supply side constraint for employment generation.

### 2. Impact of Technological Advancement in Communication Sector and Employment

Telecom sector has undergone a substantial change in terms of mobile versus fixed phones and public versus private participation. There have been major technical innovations in the sector, namely, 1G, 2G CDMA, LTE, Broadband Wireless Access, and 3G. At a time when global telecom enterprises are struggling to cope with their losses and the rollout of 3G networks, India represents an attractive and lucrative destination for investment. Industry

associations and enterprises reported in the primary survey that technological improvement reduces the cost of production with high quality services which, in turn, helps to expand the sector tremendously. All associations agreed that technological upgradation has positive impact on employment by creating millions of job opportunities in the sector.

## VI. Other Major Issues and Challenges

Other major issues and challenges emanated from the primary survey of the associations and enterprises are as follows:

### 1. Air Transport

(i) Govt. controlled airlines model followed in India is not profitable.
(ii) To promote air transport, it is important to promote tourism.
(iii) We need to concentrate more on security and hygiene to attract foreign tourists.
(iv) Increase of fuel price badly affects the sector's growth.
(v) Air surcharge, Fuel surcharge, airport tax also affects the sector's growth.

### 2. Non-schedule Passenger Land Transport by Motor Vehicles

(i) Government policies on toll tax discourage the investors to invest in this sector.

(ii) There is a shortage of driver for the following reasons:

a. People are not interested to work in this sector due to unattractive working condition, crime-prone highways and corruption and harassment by various authorities including police, RTOs etc. who harass vehicles off and on.
b. Inadequate training centres for heavy vehicle drivers.

### 3. Freight Transport by Motor Vehicles

(i) The Road transport is one of the neglected sectors of the economy. Despite being a large employer sector it does not have the status of organized industry.
(ii) Large number of restrictive rules/laws (about 17 authorities) apply to the road transport which increases the time and cost.
(iii) Difference in road taxes from state to state increases the cost. High and multiple toll taxes on the transports also increase cost burdens.
(iv) Petrol prices also differ from state to state which increase cost burden for the transports.
(v) Speed limit even on national highways is very low and it takes long hours and days to transport goods from one part of the country to another, which increases cost burden.
(vi) Working hours for drivers /helpers are not specified because of the nature of work, which discourage young people to engage themselves in this sector.

**4. Non-schedule passenger land transport by other than motor vehicles (cycle rickshaws)**

1. Since this sector provides the minimum subsistence of living to the working poor, no charges should be imposed on those who are engaged in this sub-sector.
2. Number of rickshaw pullers has decreased in cities in recent years due to National Rural Employment Guarantee Scheme Act.

**5. Courier Services**

1. Tax burden mainly service tax is found higher in this sub-sector.
2. Entry of the large number of private sector and increased economic and business activity has resulted in the growth of the sector.

## VII. Conclusion

Transport and communication sector is considered as a lifeline of economy of any country with a huge linkage with other sectors and plays a crucial role in determining country's progress and economic growth. Business operation in transport sector became easier and time saving due to the enhancement of IT sector. However, there is a massive shortage of skilled worker like driver which is a supply side constraint for employment generation. Lack of profitable model is the main reason for detonation of air transport sector. Moreover, telecom sector has undergone a substantial technological enhancement which makes India an attractive and profitable destination for investment. In telecom sector, technological improvement reduces the cost of production with high quality services which, in turn, helps to expand the sector tremendously.

The FDI in almost all the sub-sectors in transport and communication are influenced by FDI policies. It has been evident that soon after revision of FDI policies, FDI inflow has increased tremendously in all the sectors. Private telecom sector's employees are about eleven times more productive than those in government sector. The possible reasons are: government sector is less productive due to strict hierarchical order exists and has poor management efficacy.

Petrol prices differ from state to state which increases cost burden for the enterprises. Petrol prices at the place where the contract with the customer is done may be less and the truck going for a long distance needs to fill fuel at a higher price in the other states, through the truck passes. Moreover, technological changes in the operating systems of the trucks/buses have a negative impact on the employment. Speed limits even on national highways are very low and it takes long hours to transport goods from one part of the country of the country to another which in turn increases the cost burden for carrying goods. Working hours for drivers/helpers are not specified because of the nature of work. In non-vehicle category,

number of rickshaw pullers has decreased in cities in recent years due to the implementation of National Rural Employment Guarantee Scheme Act (NREGA).

In regard to the communication sector, technological improvement (1G, 2G, CDMA, LTE, Broadband Wireless Access, 3G) reduces the cost of production with high quality services which in turn helps to expand the sector tremendously. Coming up of the large number of private entrepreneurs and increased economic and business activity have resulted in the growth of the sector.

## VIII. Policy Implications

- To attract foreign tourists, the government should improve the security system to save them from internal threats of the country.
- Regulatory framework is required for measuring the standard level of hygiene.
- Reduction of fuel price, air surcharge, fuel surcharge, airport tax etc. may help to promote the aviation industry.
- Road transport sector should get the facilities and status of the organized industry.
- Restrictive rules/laws (of about 17 authorities) could be reduced to promote the freight transport sector.
- State tax should be proportionate to the number of times the vehicle enters into the respective state.
- Road tax differs from state to state that increases the cost. High and multiple toll taxes on the transports also increase cost burdens.
- Fuel prices should be same across states.
- Speed limit especially on national highways should be increased.
- Working conditions for the motor vehicle workers should be improved which will attract the young people to engage themselves in this sector.
- Since non-schedule passenger land transport by other than motor vehicles (cycle rickshaws) provides the minimum subsistence of living to the working poor, no charges should be imposed on those who are engaged in this section of sector.
- Government should provide subsidy to buy CNG design for cycle rickshaws which is costly for purchasing.
- Tax burden, mainly service tax, is found higher in the courier services which need to be relaxed so that more employment opportunities are generated in the sector.

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